

The Culture of Vaping and Meaning of E-cigarettes

A study unpacking experiences and patterns in Norway

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Dissertation submitted for the degree of Philosophiae Doctor (PhD)

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University of Oslo

March 2021

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*Series of dissertations submitted to the
Faculty of Social Sciences, University of Oslo
No. 853*

ISSN 1564-3991

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Cover: Hanne Baadsgaard Utigard.
Print production: Reprosentralen, University of Oslo.

Acknowledgments

The pursuit of a PhD degree has proved transformative. Many people have contributed and deserve to be acknowledged.

First, I want to thank the Dam Foundation for funding this PhD project, and the Norwegian Cancer Society for providing the organizational backing for it. Thanks also to the Norwegian Institute of Public Health (NIPH) for providing administrative support, interesting mandatory work and a first-class team of excellent colleagues. In addition, to my director, Elisabeth Kvaavik – thank you for your great support.

I also owe gratitude to my two supervisors, Karl Erik Lund and Willy Pedersen. Kalle, thank you for providing me with the opportunity to undertake a PhD degree in the first place. Early on, you understood the significance of the invention of e-cigarettes – both for smokers and for us as researchers. Your expertise in the field of tobacco studies, paired with your ability to keep track of the constant influx of studies, debates and innovations has been very inspiring and slightly intimidating. Throughout the PhD process, I have benefitted greatly from the sources and extensive knowledge you shared with me. Willy, your positivity has really meant much to me! Thank you for providing insightful and helpful guidance along the way, for motivating me to stay on the sociological track, and for being open-minded and supportive throughout the process.

Janne Scheffels deserves special thanks for years of encouragement, fruitful discussions and for being a great travel companion, colleague and friend. I also want to express gratitude for the insight provided by the rest of the fine group of tobacco behaviour researchers at NIPH, Gunnar, Tord, Marianne and Ingeborg.

The high-quality ‘qualitative crew’ have been of the utmost importance for this work as well as for my general well-being. Throughout the past four years, Kristin, Thomas Anton, Marit, Ola and Øystein have served as intellectual and social supporters. I am most grateful for the discussions, feedback and fun. TA, sharing an office with you (and Lars Vaular, ofc) has been a true pleasure! Kristin, thank you for reading and providing valuable feedback with such apparent ease – and for simply making all social contexts more entertaining and interesting. Solveig, thank you for your valuable support in the final days of this project.

Participants, vapers and ‘MyLifers’ alike. Thank you for sharing your time, knowledge and perceptions of the various aspects of vaping. Interviewing you was the finest and most enlightening part of the project. To my friends and family, I look forward to hanging out post PhD (and Covid-19)!

Finally, the people ‘backstage’ deserve the spotlight: Sondre, Alma and Nor, my beautiful distractions. I praise the three of you for providing the overall substantial meaning to life. Sondre, you deserve a thousand special thanks for never being boring, always supportive, and loving. I am lucky to have you. Alma and Nor, the two of you will forever be my greatest achievement. It makes me proud to see how smart, creative and curious you are. Last, a little bow wow to Lise, who deserves a salute for being a simple, soft, tail-wagging contrast to our complex society.

Rikke Tokle
Oslo, March 2021

Summary

Over the past several years, e-cigarettes – which are battery-powered devices that transform heated liquid into inhalable aerosol – have made the contemporary nicotine and tobacco landscape more complex. The use of e-cigarettes, called vaping, was initially promoted to help people stop smoking and was early on adopted by smokers. Vaping, however, is currently also associated with alternative user motives and attractiveness to young people. Internationally, the contextual frame on e-cigarettes is marked by split-risk approaches, divergent legislation and polarized views. In this dissertation, I study the vaping phenomenon with an analytical focus on the culture of vaping and social meaning of e-cigarettes in Norway. Based on three sources of data – personal interviews with adult vapers, repeated interviews with adolescents and related longitudinal survey data, I show processes of meaning making and user patterns among adult vapers who have experienced the shifting status of smoking in society, and adolescents growing up in the post-smoking era. I make use of a multiple-lens perspective to highlight various dimensions within the data, and thereby shed light on the co-occurrence of various meanings and cultures. The key findings are presented in four articles in peer-reviewed scientific journals.

The first article uses subculture theory, and concepts of identity and stigma to highlight an identified variation within the sample of adult vapers, and the emergence of a subculture within the vaper culture. As an analytical tool to show the range in practices and cultural positions, two ideal types of vaper are constructed. The “cloud chaser” type was associated with the subculture. They were dedicated vapers, many involved in vaping communities in which vaping occurred as a hobby, involving tricks, customizing devices and self-advocacy. The “substitute” type was associated with the more mainstream vaping culture. They were ex-smokers turned pragmatic vapers who used e-cigarettes to stay off combustible cigarettes. These vapers described more mixed feelings relating to their use and ranging from stigma, pleasure and addiction.

The second article highlights the similarities within the same adult sample through a focus on risk perceptions- and negotiation of e-cigarette controversies. In terms of risk, e-cigarettes were perceived as a harm reduction tool in relation to conventional cigarettes. Following this view, the present Norwegian vaping regulation, which prohibits nicotine, was framed as increasing risk by limiting current smokers’ availability to a safer alternative. In addition, the risk information on e-cigarettes from health authorities and media was decoded as predominantly anti-vaping. The sum of the identified divergence between vapers’ risk perceptions and how they experienced the public risk communication and regulation, seem to contribute to diminish vapers trust in authority provided e-cigarette information and increase their preference for lay expertise, typically available online. For some, the split risk approaches also occurs as a driver for engaging in vaping-advocacy.

In article 3, based on a comparison of findings from repeated interviews with adolescents, I identify a systematic pattern in which adolescents account for vaping as a time-limited trend. The gradual and collective change in vaping practices and the social meaning of e-cigarettes occurs in three phases: In the beginning of middle school, few had tried vaping, but several were curious because of the multiple flavours and perceived novelty. Midway in, one in three pupils reported personal use – however, mostly for flavour and without nicotine. Vaping was described as harmless, cool and oppositional. By the end of middle school and in upper secondary school, vaping had lost its status, was labelled childish, unpopular, and e-cigarettes were compared with trend-sensitive toys such as the fidget-spinners. These findings highlight the important mechanism between symbolic meanings and user practices in adolescence and may serve also to inform other substance use studies conducted among youth.

Based on longitudinal questionnaire data, the final article provides further information on adolescents' use of e-cigarettes with and without nicotine. In contrast to expressed concerns that e-cigarettes may lead to nicotine addiction among new generations of users, the majority of adolescents in the sample who reported vaping used e-cigarettes without nicotine. Moreover, most ever-users quit vaping – both with and without nicotine – during the observation period. Despite the fact that use of e-cigarettes was temporary for most youth, findings indicate that nicotine vapers still differed from both non-nicotine vapers and non-users in terms of personal characteristics. Nicotine vapers were more likely to use other tobacco products, report more conduct problems and symptoms of depression. Thus, monitoring use of nicotine e-cigarettes among adolescents can also serve to highlight youth who have other internal and external problems.

The thesis provides new insight into the vaping phenomenon and nuances the current understandings of e-cigarette use in adolescence. It shows that the current culture of vaping in Norway is fragmented, with several co-existing vaping cultures, including a distinct vaper subculture, a more mainstream culture associated with ex-smokers' substitute use, and an independent youth vaper culture marked by experimentation and temporal vaping patterns. Adult vapers and adolescents draw on different repertoires of available meanings: While the adult vapers, through comparison of differences and similarities, intrinsically linked vaping to smoking; Adolescents framed e-cigarettes as a trend-sensitive consumer product and emphasized this by highlighting features such as their novelty, flavours or sleek design. Findings illustrate the importance of avoiding a conformist understanding of the meaning of e-cigarettes, and of acknowledging intra-vaper and intra-cultural differences in empirical studies of use. It also provides support for undertaking a multiple lens approach when investigating novel phenomena in order to illuminate a broad spectrum of dimensions.

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List of Publications

- Article I Tokle, R., & Pedersen, W. (2019). "Cloud chasers" and "substitutes": e-cigarettes, vaping subcultures and vaper identities. *Sociology of health & illness*, 41(5), 917-932.
- Article II Tokle, R. (2020). Bottom-up meets top-down: exploring vapers' accounts of risk in a context of e-cigarette controversies. *Health, Risk & Society*, 1-18.
- Article III Tokle, R. (2020). 'Vaping and fidget-spinners': A qualitative, longitudinal study of e-cigarettes in adolescence. *International Journal of Drug Policy*, 82, 102791.
- Article IV Tokle, R., Brunborg, G.S. & Vedøy, T. (Revised and resubmitted). Adolescents' use of Nicotine-free and Nicotine E-cigarettes: A longitudinal study of vaping transitions and vaper characteristics. Submitted to *Nicotine and Tobacco Research*

Preface

Popular culture and smoking have been entangled for decades. What properties establish a typological character more efficiently than a cigarette? The gangster villain, the deprived white trash, the femme fatal, the tired worker, the stressed lonely mother, the rebel? The act of smoking is filled with various and shifting meanings (Sæbø, Scheffels, & Tokle, 2017), spanning from smoking as a symbol of opposition, feminism, coolness to addiction, deprivation and health issues (Collins, 2014; Klein, 1995). In Western societies, the smoking practice has gradually gone from representing the norm to being denormalized (Bell, Salmon, Bowers, Bell, & McCullough, 2010), followed by an associated shift in the meaning of cigarettes from status to stigma (Lund, Lund, & Halkjelsvik, 2014; Peretti-Watel, Legleye, Guignard, & Beck, 2014; Scheffels, 2009). Within this normative landscape, an associated disruptive technology was launched just over a decade ago. Popular culture, through movies such as *The Tourist* (2010), provided many with their first glimpse of an alternative 'smoking' ritual. In the above-mentioned movie, the main character, portrayed by Johnny Depp, is introduced to the audience seated on board a European high-end train about to smoke. Before inhaling, he excuses his 'smoking' to the passenger next to him by explaining that the cigarette in his hand is in fact not a combustible cigarette, but an electronic one. He inhales, a light on the end of the device glows. He exhales, and we see something resembling smoke. A plastic cigarette with a blue light: What a game changer! But what to make of it? What do others make of it?

1. Introduction and background

The use of e-cigarettes is still a relatively novel phenomenon, and its symbolic meanings and associated social practices have yet to be fully understood. Although a significant and growing body of work that investigates vaping behaviour has emerged, particularly from the USA and the UK, sociological studies of the social meaning- and culture of vaping remain sparse. Drawing from three sources of data – personal interviews with adult vapers, repeated group- and individual interviews with adolescents, and related longitudinal survey data from adolescents derived from the MyLife-study (Brunborg et al., 2019) – I seek to enhance current knowledge about the vaping culture and social meaning of e-cigarettes. The dissertation is guided by one overarching research question and two sub-questions:

How can we understand the culture of vaping and social meaning of e-cigarettes?

- 1. How do adult users who have lived through the shifting status of smoking understand vaping?*
- 2. How do adolescents as part of the post-smoking era approach and perceive e-cigarettes?*

Investigating the use of e-cigarettes among adults and adolescents provides a twofold perspective essential to identify variations in user and group experiences, motives, patterns and identifications. I rely on systematic analyses of data from personal interviews with 30 adult vapers, repeated interviews with 118 adolescents, and related data from online questionnaires to examine the vaping culture and the social meaning of e-cigarettes. By studying the vaping phenomenon from various angles, I seek to contribute to and expand upon current knowledge of e-cigarettes and vaping. My aim is to offer a broader understanding of how new inventions can entail multiple social meanings and be approached differently by subgroups of users resulting in a variety of consumer cultures.

Several contextual factors, ranging from the product-related, situational and personal level ones, are key for understanding the culture of vaping and meaning of e-cigarettes. Before I present the following chapters, I will set the stage, starting with a brief overview of the terminology, products in focus and a timeline to illustrate the development. This will be followed by an introduction of the main controversies applicable for understanding the contemporary vaping context, and finally, a short synopsis of recent significant and related contributions within the social sciences on vaping behavior from which the thesis draws examples, but also seeks to extend.

Framing the issue: terminology, product and history

All innovations acquire a special nomenclature: throughout this thesis, I will mostly use the term 'e-cigarette' to represent all vaping devices. Less frequently, the term 'vaporizer' is used for the same purpose. 'Vaping' specifies the associated use of such devices, while the term 'vapers' denotes the people using them. It is worth mentioning, however, that in the associated literature, scholars and users refer to vaping devices with a multitude of terms, including electronic cigarette, e-cigarette, vaporizers and ENDS (Electronic Nicotine Delivery Systems). Moreover, young people increasingly use nonstandard terminology, such as vapes, e-cigs, Juuls and mods, to denote the products or to describe subtypes of use (Morean, 2020). Although these terms overlap in the sense that they refer to the same battery-powered products, their associated meanings may vary. The term e-cigarette, for instance, can be associated with the original purpose of e-cigarettes as a smoking substitute, while also carrying connotations to more stigmatized meanings associated with cigarettes (Barbeau, Burda, & Siegel, 2013) – the most harmful legally available consumer product, and smoking – the number one cause of preventable harm and death (WHO, 2008). When investigating meaning making, the choice of words is important. When I choose most frequently to use the term e-cigarette, despite its potentially problematic connotations, I do so based on how well established the term is, and hence for the purpose of aligning the thesis with existing literature. I also acknowledge that the term vaporizer can be useful when describing alternative user practices. In contrast, within this dissertation, the term ENDS has limitations because it includes the presence of nicotine.

Next, a note on the products investigated in this thesis: e-cigarettes are battery-operated devices that heats liquid into an aerosol that users can inhale and exhale (US DHHS, 2018). Usually, these liquids contain propylene glycol, glycerine, nicotine, flavourings, additives, and differing amounts of contaminants (Hajek, Etter, Benowitz, Eissenberg, & McRobbie, 2014). Nicotine is the addictive substance found in conventional cigarettes and in other tobacco products, such as snus. Snus is a low-nitrosamine smokeless tobacco product available and widely used in Norway and Sweden. Despite e-cigarettes key unifying features, there are multiple variations of devices and e-liquids available. Since they were first launched on the market, e-cigarettes have undergone a massive evolution (Pepper & Brewer, 2014; Unger & Unger, 2018). At present, the product portfolio includes four generations of devices, shown in figure 1 below.

Figure 1: Four generations of e-cigarettes



Source: Mathur & Dempsey, 2018

The first, are known as ‘cig-a-likes’ which resembles traditional cigarettes, as they glow upon inhalation and are disposed as the e-liquid is consumed (Levy et al., 2019). The second, are the slightly larger and reusable vape pens. The third, are often referred to as mods, which are reusable open system devices that allow for customization and come in a range of sizes and shapes (Etter, 2016). Finally, there are the more recent pod-versions, which are discrete as they resemble USB-sticks (Huang et al., 2019).

Finally, a brief overview of the development in user configurations: Invented in China in 2003, the first-generation e-cigarettes were designed to provide a safer alternative to inhaling nicotine from combustible cigarettes (Hajek et al., 2014). In line with the original intention of the e-cigarettes as a smoking substitute, adult smokers were the first user group to adopt these devices (McNeill et al., 2015b). For smokers who wanted to quit, vaping not only offered nicotine, but also sensory similarities to smoking through the practice of inhaling nicotine and exhaling vapour, paired with a device to hold and fumble with (Farrimond, 2017).

However, additional and alternative e-cigarettes practices and user configurations gradually began to emerge. Particularly in the US, youth vaping increased immensely from 2016 (Cullen et al., 2019), where young people found the novel pod-types particularly appealing (Huang et al., 2019), including non-smokers (Hajek et al., 2020). At present, e-cigarettes are the most commonly used tobacco product among youth in the USA (Cullen et al., 2019). This development in user configurations among vapers, from predominantly involving adult smokers to also including young people and non-smokers, made US health officials highlight youth e-cigarette use as a major public health concern in 2016 (US DHHS, 2016).

With the e-cigarette or vaping-associated lung injury (EVALI) outbreak in 2019, yet another user direction became evident in the form of vaping to administer cannabis. In the case of EVALI, e-cigarettes were used to deliver unregulated THC-oil containing e-acetate (Hall, Gartner, & Bonevski, 2020), which resulted in a large number of lung injuries and deaths among American youths, (Layden et al., 2020). The deaths and pulmonary illnesses associated with vaping were subject to massive investigation, and together with the rise in youth vaping, e-cigarettes became subject to increased

scepticism (Dave, Dench, Kenkel, Mathios, & Wang, 2020). However, e-cigarettes were debated also prior to EVALI and the rise in youth vaping in some countries (Bareham, Ahmadi, Elie, & Jones, 2016). I will discuss this further below.

Approaching social meanings through controversies

Investigating aspects of the vaping culture and the social meaning of e-cigarettes is particularly interesting because e-cigarettes have made the contemporary nicotine and tobacco landscapes so much more complex. They entered the market at a time when smoker rates were declining and smoking was increasingly denormalized in most of the Western World (Peretti-Watel et al., 2014; WHO, 2018). Thus, the fear of a renormalization of smoking was expressed from the outset. Some suggested that vaping could challenge tobacco control and the vision of a smoke-free society because of its resemblance to smoking (Bell & Keane, 2012). At the same time, and despite of decades of falling prevalence, the numbers of remaining smokers were, and remain, substantial (Drope et al., 2018; Islami, Torre, & Jemal, 2015).

Against this backdrop, e-cigarettes have been approached on the one hand based on their potential of health gain in smokers who replace combustible cigarettes with e-cigarettes (Siegel, Tanwar, & Wood, 2011). On the other, based on the fear of renormalization of smoking, a potential increase in nicotine addiction and health loss from vaping in groups of non-smokers (Bell & Keane, 2012; Goniewicz, Gawron, Nadolska, Balwicki, & Sobczak, 2014; Vugrin et al., 2015). Hence, a split approach on e-cigarettes and vaping occurred early in the research community and subsequently in governmental regulations (Bareham et al., 2016; Bareham, Ahmadi, Elie, Jones, & McKee, 2018). There seems to be a virtual consensus among scientists that e-cigarettes are not risk free but are much less harmful relative to combustible cigarettes (COT, 2020; Stratton, Kwan, Eaton, 2018). The balancing act between the interests of adult smokers versus adolescents has contributed to a field of research marked by divergence (Carroll et al., 2021). Moreover, with the increase in vaping in global markets, and vaping attracting young people in some countries (Huang et al., 2019), the controversies and polarized views on e-cigarettes only seem to intensify (Britton, Arnott, McNeill & Hopkinson, 2016).

Through the various approaches, the contours of a gap between a more pro-vaping harm reduction approach (McNeill et al., 2015) and more anti-vaping positions (Dutra & Glantz, 2017) can be seen. In table 1, I highlight some of the topics that are subject to debate within research communities, health professionals and regulators.

Table 1. E-cigarettes topics where opposing sides are evident¹

E-cigarette topics of divergence	Anti-vaping Drivers	Pro-vaping Drivers
Targeted groups	Non-smokers and youth	Smokers and people prone to smoking
Overall aim	Tobacco-free Society	Smoking related harm and mortality reduction
Device innovation	Precaution Principle	Potential to outperform cigarettes
Nicotine addiction	Undesirable	Acceptable if health risks are low
Use of nicotine	To be limited and reserved for therapeutic use in smokers	Recreational use will exist
Smoking cessation	Efficiency uncertain. Might delay cessation and increase relapse	Offer smokers an alternative to switch. Value sensory similarities
Dual use of cigarettes e-cigarettes	Cementing addiction because of high nicotine exposure	Transient phase, vaping will reduce cigarette smoking
Visibility	Renormalize smoking	Denormalize smoking
Risk	Long-term risks unknown	Considered low based on toxicological and physiological testing
Risk communication	Nicotine products are addictive and never risk-free	Emphasis on relative risk to combustible cigarettes
Contrasting risk	Compare to non-use	Compare to smoking
Nicotine-industry	Cannot be trusted	Can be willing to cooperate
Flavours	To be restricted to demotivate never-smokers	Encourage to motivate smokers to switch
Use of e-cigarettes among non-smokers	The Gateway theory: Vaping will lead to subsequent smoking	The Diversion approach: A less harmful alternative for people who otherwise might have taken up smoking.

As the table illustrates, the divergence on e-cigarettes includes a large number of topics. Spanning from their effectiveness in smoking cessation, dual use of e-cigarettes and cigarettes (Hartmann-Boyce et al., 2020; McRobbie, Bullen, Hartmann-Boyce, & Hajek, 2014), how to measure effectiveness in smoking cessation² (not shown in table) (Polosa, 2015; McNeill et al., 2015), and determining the risk and health impacts of use of e-cigarettes (Kalkhoran & Glantz, 2015). In

¹ The table is inspired by a table presented in a conference lecture by Warner (2017).

² A frequently held view is that randomized control trials (RCTs) symbolize the gold-standard method in research for assessment of the efficacy of an intervention (Bauld, 2016). However, disagreement exists also around the correctness of RCTs² to ascertain data on efficacy of e-cigarettes (Bareham, Ahmadi et al. 2016; Weier, 2018). Some claim RCTs do not measure e-cigarettes the way they are *actually* used and promote studies of vaping from a more real world perspective, arguing that personal lifestyle statements and consumer selection processes are not always under the researcher's control (Fraser, Glover et al. 2018). Instead, use can be influenced by such as product appeal, handiness, flavours, price, accessibility, device characteristics and risk perceptions (Niaura, 2018; Weier, 2018).

addition, the generally mistrusted tobacco industry's increasing involvement in the e-cigarette market, through buying up brands and creating their own versions, serve as an additional complicating factor (Branston & Sweanor, 2016; Kamerow, 2013).

Divergence are also evident in the interpretations of adolescents' vaping trajectories. A key dimension in the discussion is whether e-cigarettes represent a gateway to smoking or a diversion from it. A gateway exists to the extent that prior vaping is a cause of subsequent smoking (Bell & Keane, 2014). Some conclude that the use of e-cigarettes is in fact a gateway to smoking (Dutra & Glantz, 2017). Others have voiced concern over the likelihood of vaping being a gateway to smoking (Chatterjee, Alzghoul, Innabi, & Meena, 2016; Kinnunen et al., 2020). Yet others object to the gateway thesis by pointing to common liabilities in these users. Liability refers to the shared underlying characteristics of vapers and smokers that can make them more likely to engage in both practices. Liability explanations thus suggests that the statistical associations between vaping and smoking initiation are more likely to be associative than causal (Chapman, Bareham, & Maziak, 2019). In contrast to the gateway thesis, the diversion hypothesis proposes that vaping can be a diversion *from* smoking. Following this view, if e-cigarettes were unavailable, youth prone to risk-taking behaviour would be more likely to use combustible tobacco products due to the absence of suitable non-combustible tobacco substitutes (Etter, 2017; Kozlowski and Warner, 2017).

The objective of this overview is not to take sides, but to show how these novel products can be negotiated within a divergent context depending on how they are framed. The situational factor of ongoing e-cigarette controversies in scientific environments have implications for processes of meaning making. When scientists take opposing sides, as in the case of e-cigarettes, it can leave the audience; including regulators, laymen and users, more confused (Carroll et al., 2021; Niaura, 2018). In addition, it can lead them to search for alternative sources of information. The quote below, cut and translated from a page of a Norwegian vaper forum, illustrates the challenges that risk communication related to vaping is subject to.

An article is circulating: "Scientists warn: E-cigarettes are ten times more likely to cause cancer compared to ordinary tobacco. Dramatic findings in new report". It strongly warns against vaping. Of course, there is a researcher behind the warning. Unfortunately, I am a smoker, but I hope to be able to quit by switching to e-cigarettes in the end. So, are these findings valid? It would be nice to have some counterarguments from people who actually know these things. (Retrieved, January 2018).

Thus, the ongoing divergence is found to have created a gap between some vapers and the orthodox part of the pro-tobacco control society. Interlinked, the scientific community have been accused of having taken a one-sided view of either the potential for e-cigarettes to addict another generation to

nicotine or the potential for smokers to stop smoking (Carroll et al., 2021). In interviews, adult vapers recruited from online communities have reported that they feel misrepresented by researchers and that they lack trust in research, deeming it as predominantly 'anti-vaping' (Annechino & Antin, 2016). The divergence has also complicated regulation based on scientific evidence. E-cigarettes have proven to be a regulatory challenge for policymakers and governments, resulting in various outcomes. At present, they are banned in around 30 countries. Others, including Norway, permit the sale of devices for uptake of e-liquid, but at the same time have banned the sale of e-liquid containing nicotine. Most countries, however, have a regulated market of e-cigarettes (both with and without nicotine) under tobacco control policies (Drope et al., 2018; Kennedy, Awopegba, De León, & Cohen, 2017)³. Hence, the split-approaches not only impact the social meaning of e-cigarettes, but also have policy and regulatory implications of relevance for both adult smokers and adolescents. For instance, in terms of access and availability. Insight into the context of controversies is there for relevant for the current thesis in order to better understand the way e-cigarette-related information and topics can be understood, negotiated and contested when approached bottom-up.

Previous studies of vaping culture and vaper identities

Tobacco products in general and cigarettes in particular have a long history as bearers of various, and conflicting meanings. From connoting stigma, addiction, poor health, on the one hand, and coolness, pleasure and opposition on the other (Collins, 2014; Klein, 1995). As such, both the use of tobacco- and snus products are regarded as means by which to express identity (Scheffels, 2009; Scheffels & Lund, 2017; Scheffels & Tøkle, 2017; Sæbø et al., 2017). However, neither tobacco cigarettes nor snus have received the volume of attention from a collective group of consumer advocates as that witnessed with e-cigarettes.

Not long after e-cigarettes were launched on the global market, groups of early adopters embraced the invention. The majority of these were identified as former smokers, who by switching to e-cigarettes found a way to substitute their use of tobacco cigarettes (Siegel et al., 2011). However, early on, some developed a particularly strong interest in the commercial technology, related research and policy aspects, resulting in the occurrence of social networks of vapers (Barbeau et al., 2013). As a result of these early adopters' unusual willingness to promote e-cigarettes (Bell & Keane, 2012; Rogers, 2010), the early diffusion of vaping is largely seen as consumer driven (Rahman, Hann, Wilson, & Worrall-Carter, 2014). Pro-vapers have referred to the development as a bottom-up health

³ In most of Europe, e-cigarettes are regulated as a tobacco product under the EU's Tobacco Products Directive (TDP). The TDP-regulation involve restrictions on types of vaporizers, refill bottles, juices and levels of nicotine in the e-liquid.

revolution, as it evolved on the side of the anti-tobacco movement and government control (Stimson, 2016).

Virtual communities (e.g. Facebook, Twitter etc.) are important in this development by facilitating a tool with which vapers can interact, exchange experiences and provide support across borders (Li, ur Réhman, & Li, 2011). Thus, the development of vaping communities (Annechino and Antin, 2016) can be seen as largely rooted in internet forums and chatrooms (Bell & Keane, 2012; Farrimond, 2017). Moreover, such consumer-based chat rooms and online communities devoted to e-cigarettes, paired with evolving commercial technology, vaping stores, events, competitions and conferences, have contributed to what we can deem a distinct 'vaping culture' (Bell & Keane, 2012). Vapers partaking in this side of the vaping culture reportedly valued the social identity of being a vaper (Barbeau et al., 2013; Farrimond, 2017). However, having a strong vaper identity is not necessarily a feature shared by all vapers. Based on differing beliefs, user motives and political interest, some are also identified as indifferent to such an identity and others are found to actively reject it (Farrimond, 2017). Identification of oneself as a 'vaper' is associated with several factors, including the role of pleasure/enjoyment, the acceptance of a medical model of nicotine addiction, the acceptability of long-term use, and political interest in vaping rights (Farrimond, 2017; Notley & Collins, 2018). Moreover, notions of stigma can be contributing factors in these processes, as the vaping experiences of adults are typically interwoven with previous or ongoing smoking experiences (Notley & Collins, 2018; Thirlway, 2016).

In addition, the massive changes in the tobacco landscape during recent decades have created a different social context for the youth of today than that of adult smokers. Therefore, the thesis applies a twofold approach. While adult vapers have experienced the shifting status of smoking, today's adolescents are part of a post-smoking era that establishes a different situational frame for their use and perceptions of e-cigarettes. Particularly, the interrelated social meanings between combustible cigarettes and e-cigarettes may be less obvious to young people. Recent figures from the USA demonstrate that 4.7% of middle school and 19.6% of upper secondary school students were using e-cigarettes (Wang et al., 2020). Data from the UK shows that 16% of adolescents have tried e-cigarettes (ASH, 2019). Adolescents' vaping, however, has been associated with more experimental user patterns (ASH, 2019). Among the minority (1.6%) of adolescents in the UK that reported regular use, most were already smokers (McNeill, Brose, Calder, Bauld, & Robson, 2019). In contrast to these, among adolescents who report use of e-cigarettes without prior tobacco experience (Chapman & Wu, 2014; Hajek et al., 2020), e-cigarettes can seem to represent a more independent consumer product unrelated to smoking (Hardcastle et al., 2014; Measham, O'Brien, & Turnbull, 2016).

An early study on vaping behaviour, showed how vapers highlighted the novelty and attractiveness associated with using a new product, and noted how vaping served as a good conversation starter and interaction device for social network building (Li et al., 2011). As a social context, adolescence is a formative period, characterized by change and development, where social acceptance and peer relationships are found to gain increased importance (Forehand & Wierson, 1993; Vartanian, 2000). Thus, adolescent vapers' experiences can also be interpreted as part of their identity projects. Choices of e-cigarettes and flavours may serve as means to show individuality or to enhance one's image as 'cool' (Hardcastle et al., 2014). Relatedly, young people report having vaped for the sake of 'having the experience' (Hardcastle et al., 2014), and for the performative aspects of it (Measham et al., 2016).

In summary, e-cigarettes, in terms of devices and technology, and vaping, in terms of motives, practices and associated identities, have been subject to innovations and change over the last 15 years. Originally intended to target smokers, but with time also used for other motives and among additional groups. In Norway, vaping has been monitored since 2013. In the adult population, it is estimated that approximately 150 000 Norwegians are currently using e-cigarettes (Vedøy & Tokle, 2019). Further, e-cigarette use emerged in a situation where the sale of devices was permitted, while sale of nicotine e-liquid was banned. Consequently, 80 per cent of the e-liquid and 60 per cent of the vaporisers are imported over the internet or purchased from retailers abroad (Vedøy & Lund, 2017).

Content of the dissertation

My study enters this field of research on a theoretical and methodological level. I see e-cigarettes as bearers of symbolic and social meanings and vaping as not only entailing various user patterns within various user groups, but also as leading to distinct vaping cultures. At the same time, the research field on e-cigarette use is often polarized in studies of either adult vapers or vaping in the younger age segment (Carroll et al., 2021). In this thesis, I empirically address both groups, which is less common. I do so in order to provide a wider frame when investigating and discussing the vaping culture and the social meanings of e-cigarettes. I use data derived from qualitative interviews and surveys to shed light on how adult vapers and adolescents experience and use e-cigarettes in Norway. In addition, I offer a broad theoretical take on e-cigarettes and the evolving and various vaping cultures witnessed in contemporary society by discussing e-cigarettes and the vaping phenomenon against perspectives from that of Subculture-, Interaction Ritual- and Actor-Network-Theory. I also rely on empirical work from a number of recent contributions in e-cigarette-related research, including those outlined in this chapter. The findings from this study appear in four articles, of which three have been published in sociological journals, and one has been submitted in a journal focusing on nicotine and tobacco research. At time of writing, this paper has received an invitation to

be revised and resubmitted for further consideration for publication. Together with this introduction chapter, these articles form the dissertation.

In chapter 2, I elaborate on the theoretical perspectives and concepts that I draw on to address the dissertation's research questions. In the published papers, I have provided space for theoretical discussions. In this chapter, I will show how these multiple theoretical contributions can offer complementary perspectives. I begin by demonstrating how the overarching aim of this study places this thesis within the tradition of cultural sociology. This leads to a brief outline of key concepts such as identity and stigma, before I offer some more background on subculture theory particularly relevant for analysing the evolving vaping cultures. This is followed by a discussion of Interaction Rituals and Actor-Network-theory, both of which, by being fundamentally different in their respective focus, can contribute to a theoretical openness useful to unpack a new phenomenon such as vaping.

In chapter 3, I describe and discuss the methodological approaches and analytical work undertaken in the dissertation. I begin by providing an overview of the three sources of data and a table that constitute the empirical foundation of the dissertation. I then seize the opportunity to provide an extended elaboration and discussion of matters related to the respective data sources, such as ethical considerations, which were restricted within the journal articles because of word limits. Finally, I will discuss how the multiple data sources can help to support the thesis's twofold approach on adolescents' vapers' and adolescents' experiences of e-cigarettes.

In chapter 4, I provide a summary of the four journal articles. The first article makes broad use of interview data with 30 adults with extensive vaping experiences. The article investigates user motives, their self-identity as vapers and involvement in vaping subcultures. The second article explores vapers risk perceptions and accounts of the risk communication and regulation of e-cigarettes in a Norwegian context. Article three, explores the evolving meaning of e-cigarettes and vaping among adolescents from 2014-2019 based on an extensive qualitative longitudinal material. While the fourth and final article makes use of prospective survey data to examine: the prevalence of nicotine and non-nicotine vaping in a nationwide sample of Norwegian adolescents, assess differences in personal characteristics between groups of e-cigarette users, and to identify transition between these groups.

In chapter five, I offer my concluding remarks on how the key findings of the four papers align with the aim of unpacking the culture of vaping and meaning of e-cigarettes. Finally, I suggest some implications of the overall findings for our current understanding of the vaping phenomenon and propose a few possible directions for future research.

2. Theoretical Framework

In this chapter, I outline and discuss the central theories and concepts drawn upon to examine the issues at hand. The overarching focus and theoretical approach of this thesis belong within the field of cultural sociology. However, I make use of multiple lenses to investigate the vaping phenomenon from several angles. In what follows, I present the cultural foundation of the thesis and briefly introduce the concepts of identity, stigma and risk in relation to vaping. This is followed by an introduction of the framework of subculture. I then discuss how employing several and even seemingly conflicting perspectives can help to acquire new understandings of vaping cultures and the meaning of e-cigarettes, with emphasis on Actor Network Theory (ANT) and Interaction Rituals (IR). Finally, by drawing on examples from the journal articles that constitute the main part of this thesis, I discuss how these multiple theoretical lenses can be employed to capture different aspects of vaping cultures and meaning of e-cigarettes among both adult vapers and adolescents.

A reflexive cultural approach on vaping: identity, stigma and risk
Culture in this thesis refers to processes of meaning making, and culture – or processes of meaning making – are seen as apparent in all sorts of social practices (Spillman, 2002, p. 7). The cultural approach is thus similar to the perspective emphasized by symbolic interactionists who also examine meaning making in fluid interactional processes (Spillman, 2002). Moreover, understanding culture as ongoing processes involves the acknowledgement that cultures are fragmented. Meanings, norms, values and practices are not necessarily obvious or unambiguous, nor universally shared, coherent, or consistent within groups or in society. Rather, people or social groups draw on the available repertoires of symbolic meanings in their context (Spillman, 2002). This can mean, for instance, that being a former adult smoker versus being a non-smoker growing up in the post-smoking era provides different points of departure when engaging in meaning-making processes related to e-cigarettes.

In line with the current understanding of culture, identity is understood as something essentially social and reflexive (Jenkins, 2014). According to Jenkins (2014), people derive their perception of identity largely from identification and comparison of similarities and differences between other persons or things (p. 2). In this context, one way to understand various vaper identities can be through comparison with the smoker identity. Relevant as the majority of adult vapers report being former smokers (Delnevo et al., 2016; Schoenborn & Gindi, 2015). Smoking is the most important cause of preventable morbidity and death in the Nordic countries, as well as a contributing factor in maintaining social inequality in health (Grøtvedt, Kvalvik, Grøholt, Akerkar, & Egeland, 2017; Lund, 2016; Vedøy, 2014). Awareness of health risks associated with smoking and the decline in the

numbers of smokers have contributed to a general devaluation of smoking in recent decades. Subsequently, the identity of being a smoker has become a matter of moral judgement and stigmatization (Farrimond & Joffe, 2006; Farrimond, Joffe, & Stenner, 2010; Lund et al., 2014).

According to Goffman (2009), stigma is a feature that is socially discrediting in a specific way and serves to label stigmatized persons with a set of unwanted characteristics. Stigma thus affect interactions between “normal” and stigmatized people (Ritzer, 2000, p. 367). Consequently, persons who experience external stigma may feel shame, loss of self-esteem and may turn to self-stigma. The latter refers to the process of inflicting stigma on oneself from a negatively viewed personal attribute that, according to Goffman, can create a gap between a virtual and actual social identity – and lead to what he deems a ‘spoiled identity’ (Goffman, 2009). Returning to the example of smokers turned vapers: negotiating a “new” vaper identity might not be straightforward for everyone. Some may struggle against letting go of their smoker identity, or against accepting or rejecting external identification between smoking and vaping by either transferring the stigma or through boundary work to distinguish these practices. However, as illustrated with the changing cultural position of smoking in society, what constitutes stigma or stigmatized attributes is reflexive, and thus subject to change and related to specific social contexts (Goffman, 2009). This entails that what is perceived as a stigma for some can be used as an emblem by others, or in Goffman words; *"An attribute that stigmatizes one type of possessor can confirm the usualness of another, and therefore is neither credible nor discreditable as a thing in itself"* (Goffman, 2009 p. 6). Thus, other vapers can perhaps be indifferent to previous smoker stigma, or proudly take a vaper identity based on the comparison between vaping and the severe risk factors associated with smoking (see for instance Farrimond, 2017).

Against this backdrop, and the previously mentioned divergence associated with the use of e-cigarettes, it can be of value to bear in mind that what constitutes risk is similarly subject to negotiation and bound to sociocultural contexts (Lupton, 2013, p. 44). For example, there is general consensus about the health advantages for smokers who switch to e-cigarettes; at the same time, there is an often-voiced fear that e-cigarettes carry the risk of increased e-cigarette use among non-smoking adolescents (Gilreath et al., 2016). Risk perspectives and risk understandings are integrated in larger cultural processes of meaning making (Lupton, 2013). For instance, adopting the harm reduction perspective involves an emphasis on relative risk. From this perspective, it seems rational that smokers who are unable or unwilling to stop should be encouraged to switch to a lower health risk alternative. At the same time, accepting the precautionary principle would involve emphasizing that the history of e-cigarettes is short and that the evidence base on risk of health effects from long-term vaping is limited. Thus, accepting the precautionary principle of risk is likely interlinked with

being more in favour of strict restrictions in general, and for the sake of avoiding potential use in unintended groups in particular (Drope et al., 2018; Hartmann-Boyce et al., 2020).

In sum, the reflexive understanding of the concepts of identity, risk and stigma highlight the importance of the broader social context. Moreover, the social context may be different for individuals and groups. For instance, concepts such as stigma and harm reduction might not be equally useful for investigating vaping among adolescents without previous smoking experiences. Thus, investigating the meaning making of the use of e-cigarettes implies an awareness of the contextual drivers within various social groups. Therefore, rather than searching for one explicit vaping culture, this approach can be applied to investigate several vaping cultures and subcategories of use, including those involving more distinct user practices typically associated with subcultures.

Subculture theory: from urban groups to online (vaping) communities
Subcultures have always been seen in terms of their relationship to and function within broader society. They can be defined as: “(...) groups of people that are in some way represented as non-normative and/or marginal through their particular interest and practices, through what they are, what they do and where they do it.” (Gelder, 2005, p. 1). Subculture theory derives from a long tradition of subcultural research, originated at the Chicago school of Sociology in the USA during the 1920s and 1930s, and later developed by the Birmingham Centre of Contemporary Cultural Studies (CCCS) in England during the 1970s. Within these subculture traditions, the emphasis was on atypical and often deviant groups. The participants in subcultures were portrayed as relatively homogenous, and subcultural groups were often regarded as cultural responses to socially marginalized positions (Gelder, 2005).

From the Chicago school, the earliest subculture studies were carried out as empirical fieldworks. These provided insight into how groups of people can create alternative sets of norms and values to those of mainstream society and how, by creating their own systems of social meanings, they could legitimize behaviour deemed deviant or delinquent (Cressey, 2008; Park, 1915; Whyte, 2012). Initially, urban locations were in focus. The city was framed as a laboratory in which human nature and social processes could be conveniently studied (Park, 1915, p. 612). Later on, subcultures were also understood as more institutional and as occurring like ‘worlds within the world’ (Gordon, 1947).

With the tradition of the Birmingham School of Cultural Studies, the subcultural approach was broadened with an increased focus on popular culture and class tension. Subcultures were seen as emerging through resistance with mainstream culture and the dominant middle-class culture on the one hand, and the working-class culture on the other (Gelder, 2005). In addition, descriptions of the process whereby objects are made to mean and mean again as ‘style’ were given extended focus

(Hebdige, 1979). As an example, Willis's famous study on working-class boys' path to working class jobs showed how identification and symbolic resistance to a 'conformist' culture marked by middle-class values were expressed through consumer goods such as cigarettes, alcohol and clothes (Willis, 1977). Willis shed light on mechanisms (identification, resistance, negotiated practises) that in ways correlate with drivers in the emerging vaping subcultures that I will return to later. Thus, the traditional subcultural perspectives outlined here, provide ways to investigate alternative expressions, but have also been criticized for shortcomings in term of describing more contemporary subcultures in a fragmented culture (Clarke, 1982; Gelder, 2005; Sandberg, 2013).

As a response to more postmodern forms of sociability, subcultures over recent decades have increasingly been treated more as a result of the heterogenic nature of social contemporary life (Gelder, 2005, p. 183). The more contemporary understandings also devoted more space to identity (Fine & Kleinman, 1979; Sandberg, 2013). Fine and Kleinman (1979) relatively early on provided a less rigid understanding of subcultures as culturally bounded networks of people who share ideas, material objects and practices. Their conception offers an understanding of how cultural consumer elements, such as e-cigarettes, can be widespread in a population but also hold various meanings within various groups. They acknowledge the existence of local variations in cultural content through interactional negotiation in group settings, as well as the dynamics of subcultural change (Fine & Kleinman, 1979, p. 17). Such a reflexive understanding of subculture is of value when exploring emerging vaping subcultures within the broader fragmented vaping culture, as it suggests emphasis on how (otherwise heterogeneous) individuals subscribe to shared interests and beliefs (Gelder, 2005 p.12).

In addition, the internet a new resource for the affiliation and expression of subcultural identity (McArthur, 2009). The rapid development of the internet has contributed to the emergence of new subcultures in contemporary society (see for instance; Kahn & Kellner, 2004; Williams, 2006; McArthur, 2009). Dimensions creating tension can still be important subcultural drivers, such as opposition and resistance to stigma or dominant risk approaches. However, in contrast to previous subcultures bound to face-to-face environments, the internet has facilitated a new borderless medium for subcultural existence (Williams, 2006). Through online forums and social media (SOME) networks, individuals who otherwise might not have participated in a subculture are provided platforms on which to respond, interact, share, and as such, develop subcultural identities (Williams, 2006). This online development thus opens for new understandings of present-day subcultures, with an emphasis on how online arenas enable the expression of subcultural identity detached from physical space and geography (Kahn & Kellner, 2004; McArthur, 2009).

Conceptualizing the agency of technology and sociability in vaping

The e-cigarette has undergone development and, as previously mentioned, it has been subject to massive innovation. To consider this dimension, an alternative approach to the novel vaping phenomenon might be to describe the actual invention and its technological progress; namely, to focus on e-cigarettes as technical objects holding certain features that allow for several practices to emerge. In the USA, where youth vaping has been most prevalent, the increased interest has been associated with the arrival of the discrete pod versions on the market (Huang et al., 2019). The newer versions bear little resemblance to the prototype invented by Hon Lik in China in 2003, which was designed to resemble a traditional cigarette (Bareham et al., 2016). Thus, when addressing use in the contemporary new nicotine market, a more relativist theory such as Actor-Network-Theory (ANT), with a preference for descriptions and inscriptions of objects (actants) over meaning, can offer a supplementary lens (Latour, 1996).

According to the ANT perspective, agency can be found in both human and nonhuman objects (actants). Hence, the ANT perspective focuses attention on how nonhuman objects such as the e-cigarette act on users, engage in practices and operate in networks (assemblages) (Latour, 2005, p. 68). The ANT concepts of inscriptions and translations can be of relevance in a study of vaping. Inscriptions refer to the specific features of an object (actant), and how an object – in this case an e-cigarette – creates a user pattern by way of how the object facilitates its own use (Latour, 1987). For instance, the e-cigarette is made for inhalation through a mouthpiece. It come in a size which makes (most of) them easy to carry around. At the same time, they are heavier than the conventional cigarette, so that many will hold them differently. In contrast to cigarettes they are not guided by the time frame starting from lighting the cigarette at one end and ending with reaching the filter; instead, they are more flexible, as they leave it up to the consumer to decide when the practice starts and ends. An object with a strong inscription will automatically force the object to be used in a given way, whilst a weak inscription allows alternative user patterns than those originally intended by the creator.

In ANT terms, conventional cigarettes can be seen as having a strong inscription, while e-cigarettes in comparison have a weak inscription. The ever-expanding product portfolio, the increasing number of youth vapers found in the USA (Cullen et al., 2019), or the use of e-cigarettes to deliver alternative substances might serve other indications than that e-cigarettes have weak inscriptions, given their original conception as a smoking substitute. The term translations refer to creating an inscription in order to align the object (or the assemblage) in a particular way (Latour, 1994, pp. 32-41). For instance, the changes in user configurations in the USA have been directly associated with the e-cigarette JUUL's arrival on the market. Translations in this case refers to the novel and discreet shape

of these pod-devices, which resemble sleek USB sticks. These translations of the original inscription seem to facilitate use in youth settings, such as school environments (Ramamurthi, Chau, & Jackler, 2019). In response to this development, another form of translation of the inscription of e-cigarettes could be to increase standardization of vaping products or to alter vaping regulations. Thus, as I have tried to illustrate above, the strong point of ANT is making objects co-participants in the development of action (Latour, 2005 p.70). The Interaction Rituals (IR) perspective on the other hand, can offer a complementary lens to investigate the sociability and ritual aspects of vaping.

Collins' theory of interaction ritual chains (2004) builds on Durkheim's theory of rituals, Weber's conflict theory and the microsociology founded by Goffman. According to Collins an, IR *"is the process in which participants develop a mutual focus of attentions and become entrained in each other's bodily micro-rhythms and emotions"* (Collins, 2004, p. 47). In ways similar to the constructivist understanding of identity outlined above, IRs are seen as creating symbols of group membership, and to represent boundaries of inclusion and exclusion (Collins, 2004, p. 297). Collins (2004) can also be seen as partly meeting Latour (2005) by acknowledging the importance of objects in IRs. Membership symbols is the concept Collins uses for items subject to a group's attention during such rituals (2004, p. 150). An application of the IR lens can thus provide an additional theoretical tool to highlight the various levels of solidarity and commitment to e-cigarettes as membership symbols in social groups and situations. It can also be employed to explain how external conditions can shift the symbolic meaning of a given product and thus the strength of the social ritual (Collins, 2004). Collins himself used the shifting position of smoking in society as an example to show how interlinked social meanings of rituals are with social context, by illustrating how the smoking ritual went from being associated with social elites to representing outsider positions (Collins, 2004). Applying the same lenses to vaping can thus provide supplementary ways to grasp vaping cultures and the meaning of e-cigarettes among different social groups. This is for instance illustrated by Yule and Tinson (2017), who identified vaping as a low-intensity ritual based on varying levels of formality and process, and linked it to mechanisms for misbehaviour among young people.

Studying an unsettled phenomenon

The short market history for e-cigarettes means that the full picture in terms of vaping cultures and the social meaning of e-cigarettes can be challenging to ascertain. For instance, an online search using the terms e-cigarettes or vaping will quickly illuminate what could be deemed the narrower, but at the same time, perhaps most visible, sites of the vaping culture in the form of numerous blogs, forums and tutorials devoted to vaping. The content varies between platforms, but can typically range between emphasizing vape tricks, equipment, engaging in self-advocacy, consumer support groups and so on. Despite the split approaches on e-cigarettes – or maybe because of it, e-cigarettes

are used in remarkably bold and visible ways (See for instance Annechino & Antin, 2016; Farrimond, 2017). At the same time, e-cigarettes have also gained a position in the more mainstream culture. They have found their way into the popular culture, as seen on monitors in prize-winning series such as *Euphoria* (released on HBO, 2019) and *Billions* (released on Netflix, 2016). More importantly, they are used as an alternative to conventional cigarettes by millions of people worldwide (Euromonitor, 2021) and have gained the attention of young people (Cullen et al., 2019). The various theoretical lenses outlined above, both reflect and contribute towards investigating the unsettled phenomenon at hand by providing various ways to understand the fragmented culture of vaping and the various meanings e-cigarettes can hold within different groups such as adult vapers and adolescents.

In the three first articles, meaning making processes are investigated on the ground, at the subjective level (Spillman, 2002, p. 7). The two first, elicited through interviews with adults with lived experience of vaping, and the third based on longitudinal interview data with adolescents. In these articles, I make use of different theoretical lenses, such as identity, subculture, ANT or IR, in order to situate these meanings or experiences within the broader social context. The first article (Tokle & Pedersen, 2019) explores the subcultural dimension of vaping cultures and makes use of the concepts of identity and stigma (see Jenkins, 2014 & Goffman, 2009) to illuminate differences and similarities within a group of adult vapers.

A relevant example for understanding the vaping subculture approach can be found in Thornton's study (1995) of young British clubbers. Thornton describes subcultures as ideological communities, which are used to show distinctive character and affirm that members are not part of an undifferentiated mass (Thornton, 1995 p.185). By launching the term 'subcultural capital', Thornton integrates the work of Bourdieu (1984) into her subcultural studies of clubbers who desire to be hip over mainstream. Similar to Goffman's notion of the reflexivity of stigma (Goffman, 2009), subcultural capital "*confers status on its owner in the eyes of the relevant beholder*" (Thornton, 1995, p. 186), and is hence, in some ways similar to Bourdieu's cultural capital, but without the strict class-dimension (see Bourdieu, 1984). Following Thornton, subcultural capital can be objectified through, for instance, having the right haircut – or the most advanced mod [type of vaporizer], if to transfer it on to the vaping subculture. It can also be embodied, in the form of 'being in the know', displayed by using the right terminology or acting like a natural when performing the latest practices of value. Subcultural capital is used in contrast to those deemed less relevant, mainstream and unhip, and is achieved through being perceived as 'in the know' by relevant others (Thornton, 1995). This is also similar to the process of constructing a social identity through similarities and differences (Jenkins, 2014). In this article (Article 1), various identified characteristics related to vaping led to the construction of two different vaper identities, one of which included vapers sharing characteristics

that suggested a vaping subculture, as the social meaning of vaping could be seen as extending far beyond that of being solely a smoking substitute. Moreover, those labelled with this vaper identity were 'in the know' on vaping-related matters, to use the term coined by Thornton (1995).

Subcultural capital could be linked with feats such as customization of devices, performing tricks or steeping of e-liquids for various flavours. However, stigma and resistance are also contributing key concepts, as the emerging of a vaping subculture can be seen as a tension or a response to stigma, following the denormalization of smoking in the Western world during recent decades (Peretti-Watel et al., 2014; Sæbø, 2017). Thus, identity and subculture theory can be particularly useful in the present thesis to delineate differences within groups of vapers (Article 1).

Shifting the focus to the concept of risk and risk knowledge, on the other hand, can serve to highlight similarities within the same group (Article 2). E-cigarette aerosol generally contains fewer toxic chemicals than conventional cigarette smoke (Stratton, Kwan, Eaton, 2018). However, vaping is not harmless; it can expose users to substances known to have adverse health effects, including ultra-fine particles, heavy metals, and other unpredictable and potentially harmful ingredients (COT, 2020; Stratton, Kwan, Eaton, 2018; US DHHS, 2016). Thus, vaping conveys health risks when compared to not using any inhaled recreational drugs, particularly for 'unintended groups' such as children and non-smokers (WHO, 2014). The reflexive understanding of risk (see Lupton, 2013) offers ways to investigate how this ambiguity is negotiated among vapers who used to smoke (Article 2). Moreover, ascertaining vapers' understandings of risk contributes towards an understanding of emerging vaping communities in contemporary society and the meaning of online platforms.

Subculture theory (Article 1), together with concepts such as stigma and risk (Article 2) are useful analytical perspectives when investigating the position of dedicated vapers engaging in such as vaping policy, and self-advocacy. The perspective of IR on the other hand, can offer a way to highlight the sociability of vaping in less distinct groups and in the broader youth culture (Article 3). Article three also illustrates how an ANT-inspired approach can offer a sensitivity to the novelty and the technical sides of the e-cigarette invention. Looking at the vaping phenomenon through the lenses of ANT provides the possibility to zoom out on the device, to investigate how the product facilitates the practices at hand, and to maintain this focus throughout the analysis. Is choice of products a coincidence, a mod, a vape pen, a sleek pod version? The flavours, delivery of nicotine? Price and availability?

While the theoretical perspective of IR, can provide a tool to zoom in and investigate how these devices integrate in social rituals, and thus capture the sociability of vaping, as well as drivers in and out of use. Collins' (2004) notion of 'membership symbols', for instance, is useful for grasping the

product's social status, and thus the contributing mechanisms such as experimentation, peer pressure or disapproval (article 3). Separately, the ANT perspective offers a sensibility to the material aspects of e-cigarettes, while IR can be used as an analytical tool to attend to the social features of the practice. Applied together, these perspectives can combine to demonstrate how the synthesis of the materiality and technology of the e-cigarette (ANT) are entangled in the collective dimension of vaping (IR).

In addition to the three qualitative articles mentioned, which in various ways make use of the above outlined theories and concepts, the thesis comprises a fourth quantitative paper. In this paper (article 4), rather than investigating meaning-making processes, the aim was to investigate vaping prevalence, transitions in vaping behaviour and to consider whether there were any differences in personal characteristics between adolescents who reported use of e-cigarettes and those who did not. Approaching behavioural aspects – such as vaping – based on an understanding that such actions can be associated with personal characteristics is common in psychology, and particularly in the psychobiological paradigm (Zuckerman, 2011). Within substance use studies, the psychobiological terms sensation-seeking and depression are among some of the frequently used sources by which to assess whether there are personality and individual differences (Brunborg et al., 2019; Jessor & Jessor, 1977). While these terms contrast with the overarching reflexive cultural approach, they can be combined with the more psychosocial perspective of problem behaviour to maintain an awareness of the social environment in which such use takes place (Jessor, 1987). (More information on sensation seeking, depression and problem behaviour is provided in the method section, source 3).

In sum, I have suggested that several theoretical tools can be utilized to unpack sides of the complex vaping phenomenon and its various social meanings, user practices and patterns. Although many of the outlined theoretical perspectives or concepts separately could have served as the main theoretical focus, my aim has been to illuminate how shifting perspectives can be used to capture a broader range of dimensions associated with e-cigarettes and vaping cultures. In my view, applying a multiple lenses approach provides an important reflexivity of value because of the novelty and unsettled nature of the subject in focus.

3. Methodology

In this chapter, I present and discuss the methodological aspects of the dissertation, which consists of three sources of data presented in four papers (Table 2). The guiding aim of this section is to elaborate on some of the methodological aspects and challenges not covered in the four journal articles.

Table 2. Sources of data

S	Paper	Aim to capture	Study designed to capture	Data	Sample (N)
1	1. & 2.	The voices of adult vapers. Examine various motivations for use, identities, vaper (sub) cultures and risk perceptions.	Insight into how a heterogeneous sample of adult vapers experience using e-cigarettes in Norway where the practice is regulated	Qualitative semi-structured personal interviews.	30 adult vapers.
2	3.	The voices of adolescents providing the evolving meaning of vaping and e-cigarettes in a Norwegian youth culture context.	Trajectories in adolescent substance use. The Monitoring Young Lifestyles (MyLife) study was initiated as an integrated quantitative and qualitative prospective investigation of correlates, causes, and consequences of adolescent'	Qualitative longitudinal semi-structured group- and personal interviews. Four data collections from 2015-2019. 50 group- and 175 individual interviews.	The baseline (T1) sample consisted of 118 12–13-year-olds from six 8th grade classes from six schools. At T4, they were 16–17-year-old and in high school.
3	4.	Adolescents' use of nicotine and nicotine-free e-cigarettes in Norway. Contrasting related characteristics and vaping patterns over time.	e-cigarette, tobacco and substance use and other addictive behaviour in Norway.	Quantitative longitudinal survey data. Three data collections: 2017, 2018 and 2019.	2,975 8th, 9th and 10th graders from 33 middle schools Of whom 2018 completed all three questionnaires.

As shown (Table 2), this thesis makes use of data derived from multiple methods, which is a pragmatic approach useful to illuminate a multifaceted topic (Tashakkori, Teddlie, & Teddlie, 1998). Pragmatism in this context involves making methodological choices based on what fits best with the research question(s) at hand (Zhang & Creswell, 2013). In general, qualitative methods are well suited to address broad questions and provide insight into the broader social contexts in which

individuals' meanings are situated and their practices developed (Creswell, 2007). Corresponding with the cultural approach outlined in the previous theory chapter, the overarching research paradigm, or the "... *basic set of beliefs that guide action*" (Guba, 1990, p. 17), of the qualitative studies aligns with that of social constructivism. Because interpreting meanings and how they are made require that I both acknowledge the interviewees' subjective and varied understandings of experiences and objects, and that I look for complexity in their views (Creswell, 2007, pp. 20-21). Quantitative methods, on the other hand, are fit to investigate proportions, patterns and user characteristics in larger samples. Together the multiple method data provides an empirical foundation for investigating various sides of the culture of vaping and meaning of e-cigarettes in Norway. In what follows, I describe and discuss the origin of each source. I begin with source 1, the qualitative explorative study with adult vapers and follow up with source 2, the qualitative, longitudinal study with adolescents; finally, I examine the third and related source, the quantitative, longitudinal study with adolescents.

Source 1: Qualitative interview data with adult users of e-cigarettes

Source 1 data consist of 30 qualitative personal interviews with adult vapers, carried out in two phases.

Exploring the vaping phenomenon online and bottom-up

Working at the Norwegian Institute of Alcohol and Drug Research (SIRUS), I was given the opportunity in 2014 to investigate – the at that time and for me new phenomenon – use of e-cigarettes. The initial objective was to explore how users experience and perceive e-cigarettes. With the general foundation of social science literature being limited on the subject, and users' experiences with e-cigarettes not previously having been investigated in Norway, I had no initial hypothesis to investigate. Hence, my pathway into the field was highly inductive. The explorative study design aligns with the constructivist grounded theory (CGT) as positioned by Charmaz (2014). CGT has its origin in grounded theory (GT) (Glaser & Strauss, 1967) and follows several of the GT strategies for qualitative research, such as employing an inductive, emergent, open-ended, and iterative sampling and analysis approach (Denzin and Lincoln, 2008). CGT does, however, offer more pragmatic and flexible guidelines to the fixed methodical rules of GT (Charmaz, 2014; Charmaz & Belgrave, 2007). In addition, CGT differs from the more positivist epistemology of early GT, by perceiving data as a co-construct between the researcher and the interviewee, rather than as an objective truth revealed by the researcher (Charmaz, 2017).

Personal interviews are suitable for exploring novel phenomenon by enabling investigation of individuals' own understandings, experiences and practices. To access the field, I searched for information on e-cigarettes online. This directed me to a Norwegian forum devoted to vaping and an associated Facebook (FB) group, which revealed numerous users sharing knowledge, support, enthusiasm and frustration. I decided to join the FB group, which at that time (2014) had 6000 members. After having observed the high activity on these pages for a period, I requested permission from the administrators to publish a post where I presented the project and myself, in order to ask if any of the associated members would be willing to meet in person for an interview. As permission was granted and the interview request was published, I was also invited by some of the forum members to a physical vape meeting in Oslo. This meeting enabled me to pose questions, observe practices, equipment, and listen to eight vapers discuss e-cigarette-related topics for three hours. Simultaneously, several e-cigarette users had reached out on FB. I had found an entrance.

The sampling criteria were broadly defined as adult men and women with lived experience of e-cigarette use in Norway. In total, 16 interviews were conducted in the first phase in 2014⁴. I interviewed seven participants recruited through the vaping group on Facebook (5) and the physical vape meeting (2). It was obvious to assume that these vapers, with ties to the same forum devoted to e-cigarettes, might have assimilated shared stories and similar perspectives through the online community interaction. However, the high activity online and the numerous members participating on these vaping platforms made it expedient to include representatives in a study investigating user experiences and meaning making. At the same time – and in line with CGT design – it became important to investigate whether experiences associated with use of e-cigarettes were different for users without possibly biased knowledge or ties to established vaper communities. As a measure, I began actively recruiting broadly outside the forum setting, through extended network and nightlife venues. This resulted in nine additional participants.

Having received PhD funding, I was given the opportunity beginning in autumn 2016 to explore the social and cultural determinants associated with vaping and e-cigarettes more extensively. I wanted to include the first phase data since the Norwegian legislative status on e-cigarettes had not changed, and I knew that there were several dimensions present within the material that deserved more unpacking. However, to ensure that the interviews were not dated, I started comparing the most recent acquired findings with the existing interviews. Because I found the new interviewees to largely echo former participants, both in terms of their experiences and perspectives, I felt assured that the findings were still valid. In addition, I also found it necessary to conduct additional interviews – in GT term called theoretical sampling, throughout the period as new topics became evident in data or interviews (Glaser & Strauss, 1967).

In line with the explorative objective of this study, participants in the second phase were also recruited from various locations for the purpose of variation. This included vape shops, nightlife venues and a festival. The former chosen purposely to see if I could seek out young urban adults and to investigate the position of e-cigarettes in these environments, as a possible contrast to vape-platforms. On that note, when conducting qualitative research, the goal is rarely to generalize, but rather to provide a rich, contextualized understanding of some aspects of a particular phenomenon (Ayres, Kavanaugh, & Knafl, 2003). Thus, the process of recruiting in different arenas reflected the inductive design. A level of sample diversity allowed me to further investigate uncertainties and highlight diversity and different perspectives in the data (Creswell, 2007, pp. 240-241). Sampling for variation also involved trying to reach the less visible vapers. To do this, I used a chain-referral

⁴ Some of the findings from the first 16 interviews are presented in a SIRUS-report (Tokle, 2014).

strategy whereby I recruited through extended networks and snowball sampling (Biernacki & Waldorf, 1981). Additionally, this strategy was used to actively recruit more women, as I wanted a certain level of gender balance. In total, the sample consisted of 13 women and 17 men. Issues specifically addressing gender, however, were rarely brought up during interviews. I acknowledge that this could have been a self-energizing effect related to an absence of focused questions on gender implications associated with use of e-cigarettes in the research guide. Despite my lack of a gender focus – which can be seen as a limitation – some did describe the vaping culture as being somewhat stereotypically masculine (mentioned in article 1), which might suggest that applying a more focused gender perspective on vaping might have been of value.

The interview guide was structured around broad topics associated with e-cigarettes, spanning from initial experience, smoking history, user motives and vaping patterns, to identification with other vapers. I conducted all interviews in person, and although guided by a list of themes, the interviews were open-ended and flexible enough to allow me to adjust and add questions as information arose. In this way, face-to-face interviewing requires both the interviewer and the interviewee to be active participants (Gubrium & Holstein, 2003). The flexible approach also guided the overall recruitment process. Locations were decided based on the interviewees' preferences. I encouraged them to suggest a place, but also provided them the option of my office or some specific cafés. They opted for different alternatives, ranging from their own offices, my office, the outdoors, bars and quieter cafés. I also preferred to offer interviewees something to drink, a coffee or a soda before starting the interview. I found these small gestures created an atmosphere for informal chatting, which I felt helped to establish a friendly ambience. My aim throughout was to make the interviewees feel comfortable. In addition, all interviewees received 300 NOK (approximately £30) to compensate for their time. For me it felt good to be able to offer something beyond merely something to drink and verbal gratitude in return for their time. The interviews lasted on average between 1-2 hours, and the honorarium may have indirectly contributed to the length and richness of data, as it made me more relaxed and less apologetic about keeping them occupied.

Interviews continued until saturation was met for the main study purpose, which was not straightforward in this explorative study. Saturation means that additional interviews would not add any additional meaningful information (Merriam & Tisdell, 2015). I reached 25 interviews before experiencing that the most recent interviews added nothing substantial to my understanding. In line with the principle of saturation, I felt determined after completing 30 interviews that the research findings were reliable and valid for further investigation of adults' meaning making of e-cigarettes. One that note, the youngest adult interviewee - and the only one without a previous history with smoking – described experiences that indicated that youth vaping could involve additional social

meanings. However, with the current sampling criteria being adult vapers, unpacking dimensions associated with youth vaping would involve additional sampling of young vapers which extended the scope of the current study. For an overview over sample characteristics, please see tables in article 1 and 2.

Ethical considerations

The first phase data collection (2014), which was carried out at SIRUS, was cleared with NSD (Norwegian Centre for Research Data) and evaluated again in 2016, prior to the additional data collection by the Privacy Protection Committee at NIPH. In line with their ethical guidelines, all interviewees were fully informed about the study, its purposes and funding prior to participation. They were given information about the project upon recruitment (i.e., in the FB post, by text message or email when contacted through extended network or snowballing) as well as formalized in writing prior to each interview. In addition to giving them time to read, I repeated the most crucial information in conversation. I particularly stressed that study participation was optional and that they had a right to withdraw their consent and associated data at any time if they should later come to regret participating. I also ensured anonymity. This involved taking measures such as verbal rather than written consent and avoiding asking for sensitive or identifying information, such a name or place of birth, as I was recording. Recordings were deleted after they were transcribed, and pseudonyms were assigned in the transcripts. In cases where potentially identifying information occurred, i.e. workplace or specific geographic locations, I systematically altered or excluded this from the transcripts.

In addition to these standard measures in qualitative studies, the constructivist approach also means acknowledging that research itself is a construction occurring under specific conditions (Charmaz, 2014). The specific conditions in this context, which I was made aware of early on and was somewhat naively surprised by – involved, for instance, the lack of trust in me and my intentions that some expressed based on the fact that I was a government-funded employee. This made me aware of the perceived discrepancy between many vapers' perceptions of e-cigarettes and their perceptions of the more public approach on e-cigarettes. In addition, it made me reflect over my own researcher positionality and the interviewees' agenda. In practice, this involved me stressing that I conducted independent research without preconceived ideas of what is morally right or wrong, that there was no such thing as correct or incorrect answers to my questions and that my aim was insight into their experiences and perspectives. I also mirrored their terminology and avoided referring to the use of e-cigarettes as smoking. In terms of interviewees with an agenda, I acknowledge that the most dedicated vapers saw the interview as an opportunity to highlight the benefits of vaping. However,

this is in itself interesting, and provided relevant and valuable data. In addition, by strategically recruiting less visible users, I felt assured that I was able to avoid an one-biased sample.

Data analysis and construction of concepts

Having conducted all the interviews myself yielded the benefit of closeness to data. In the inductive coding process, transcripts were imported and coded in the qualitative coding software HyperResearch. In this coding process, codes were developed based on grouped excerpts or phrases from the interviews with similar meanings (Tjora, 2012). The data collection and the initial analysis processes were also in ways interlinked. As outlined above, interviewees could introduce new themes, or additional dimensions became evident as I coded transcripts or reread coded data. In some cases, this caused me to conduct additional interviews. During the writing process, the complete set of coded data was subject to systematic comparison within and across codes to illuminate patterns, themes and the more hidden processes at play (Charmaz, 2014). Findings are also presented with an awareness of the relevant social contexts in which they are situated (Charmaz, 2014).

The first article focuses on the interviewees' different approaches to vaping, ranging from those of the proud 'public' vapers to the more reserved and reluctant ones. Through sorting and comparing codes indicating motives, identifications and user patterns, the ambiguity and variation between the interviewees' positions were systematically illuminated. This led to the construction of concepts in the form of two vaper identities ('Cloud chasers' and 'substitutes', article 1). Similar to Weber's term ideal types, these constructed groups function as tools to explain and highlight distinguishing characteristics of the social phenomenon of vaping. Importantly, however, such ideal types are not expected to be found in their pure form in social reality, but are useful in differentiating various types of vapers. In this context for instance, these constructed vaper types are used to illuminate a vaper subculture within the broader vaper culture. Generating constructed concepts to specify relationships and unpack a phenomenon can somehow align with the purpose of GT to theorize from empirical findings. However, I do not imply the creation of formal theory. These constructed vaper types can perhaps be understood as a form of middle-range theory building, which in CGT simply refers to abstract representations of specific social phenomena that are grounded in data (Charmaz, 2014, P. 18). In addition, conceptual generalization is an aim in GT, which means to provide concepts that have relevance beyond the specific data source (Tjora 212, p. 215). Since the article was published, the constructed vaper concepts have been applied on findings from related studies situated in different social contexts, see i.e.: (McCausland et al., 2020; Smets, Baeyens, Chaumont, Adriaens, & Van Gucht, 2019), which might suggest a level of conceptual generalizability and transferability (Ayres et al., 2003).

Results from the 30 semi-structured personal interviews with adult vapers that constitute source 1, are presented in the two first articles in this dissertation. The first paper was written on the notion of variation. The second paper pursues the more unifying dimension within the sample. In addition, source 1 provides data on adults' vapers *perceptions* of youth vaping (Article 2), but also illuminates the need for additional data to investigate e-cigarettes' position within the youth culture, which leads to the next sources.

The MyLife study: the origin of source 2 & 3

As I started working on my PhD in autumn 2016, the social context surrounding vaping had begun to involve an increased focus on the use of e-cigarettes among young people. The backdrop was the identified rise in numbers of youth vapers in the USA from 2014 (King, Patel, Nguyen, & Dube, 2015; McMillen, Gottlieb, Shaefer, Winickoff, & Klein, 2015). Numbers that were found to escalate even more in the USA as of 2016 (Cullen et al., 2019; FDA, 2018). Whether a similar trend could be witnessed in Norway was however uncertain. We lacked studies at the time that could provide insight into the status of vaping and use of e-cigarettes among Norwegian adolescents. In line with the original explorative approach of the thesis, I found it important to include the dimension of adolescents in the overarching aim. Not only were these evolving new user configurations important independently, but they also had implications for the broader social context and meaning of vaping.

The large Norwegian multi-method, longitudinal youth study Monitoring Young Lifestyles (MyLife) provided an ideal opportunity to investigate Norwegian adolescents' e-cigarette use. The MyLife study was originally designed to examine a wide range of research questions from diverse fields such as sociology, psychology and epidemiology. The study employs both quantitative and qualitative methodologies and facilitates the study of developmental issues, life transitions, and risk and protective factors relevant to young people's health and youth cultures in general, and underage substance use in particular. Since I had been involved and contributed in this study from the onset, I knew questions about e-cigarettes had been included from baseline in both the qualitative and quantitative arm of the MyLife project. In the current thesis, the qualitative data represent source 2 and the quantitative data source 3.⁵

⁵ Additional details and more general information about the MyLife study can be found in Brunborg et al. (2019) and on the following website: <https://www.fhi.no/studier/mittliv/om-mittliv/> (Accessed, 08.02.2021).

Source 2: Qualitative longitudinal interview data with adolescents

Source 2 consists of 50 focus group and 175 individual interviews with a large sample of Norwegian adolescents (N = 118 at T1). Data are from the above-mentioned MyLife study. Interviews have been completed in four stages (T1-T4), beginning when the students were 12–13 years in 2015 until 16–17 years in 2019.

The purpose of the qualitative longitudinal design is to collect responses that can be read against each other (Yates & McLeod, 2007). As such, the strategy provides an invaluable opportunity to analyse how perceptions and experiences can change and evolve over time (Saldaña, 2003). In the current thesis, source 2 is used to explore the evolving social meaning of e-cigarettes and vaping. In what follows, I provide an overview of the timeline and key information from the data collection, reflections on the process of analysis and some of the ethical considerations.

Research design and data collection

When designing the study, it was decided early on to recruit participants at class level as this would ensure inclusion of both genders, a level of heterogeneity and make the recruitment process more manageable since we could cooperate with the respective teachers in each class. The next step of the main study sampling procedures involved selection of geographical areas. Six schools located in the north, the south and the east of Norway were included. Further, to ensure both urban and rural representation within each region, one school class from the largest city and one from a rural municipality within a two hours' drive from each city were selected. The aim was to enrol one entire eighth grade class/cohort per school. The sampling procedures ensured geographical and sample diversity, which make these data particularly suited to investigate the position of vaping within the broader Norwegian youth culture.

A pilot was carried out to test recruitment strategies and to inform the main study decisions concerning the timing and balance of individual and group interviews, group sizes and composition. One of two pilot classes continued to participate and was included in the core sample, although baseline was completed one year ahead of the main study schedule (see table 3 below). These interviews continued to advise the main data collection. In the description of procedures hereafter, the pilot class is integrated unless otherwise stated.

Table 3. Timeline and overview over qualitative longitudinal study

	Time Point (T) 1 N = 118 58 boys & 60 girls	Time Point (T) 2 N = 85	Time Point (T) 3 N = 95	Time Point (T) 4 N = 80
Pilot study 1 class	Fall 2014 N = 13	*Pilot not included	Spring 2017	Autumn 2018
Main study 5 classes	Fall 2015 N = 105	Fall 2017	Spring 2018	Spring 2019
Interview form	Group interviews (26)	Group interviews (24)	Personal interviews (95)	Personal interviews (80)
Cohort	Middle school 10th grade	Middle school 10th grade	Middle school 10th grade	Upper secondary school 1st year
Age	12-13 years	14-15 years	15-16 years	16-17 years

** T2 data from the pilot class (n = 13) were not comparable to T2 main study and were therefore not included in the overall dataset. The first pilot follow-up was carried out with the participants at a younger age, and as personal interviews rather than group interviews.*

Combining group- and personal interviews

As shown in table 3, the baseline data collection (T1) and the first follow-up (T2) were conducted as focus group interviews (table 3). Group interviews came out as facilitating the most beneficial interview setting on substance issues because of the respondent's young age (12-13) at study onset. The first rounds of interviews largely revolved around perceptions because few had personal experience with vaping or other substances at this point. Group interviews were repeated at time two also based on the argument of comparison from T1 to T2. The size of each group ranged from three to six students. Focus groups are particularly suited to explore participants' perceptions and experiences in an interactive format (Lambert & Loiselle, 2008), and hence the collective understanding of the social meaning associated with e-cigarettes and vaping (article 3). The teachers assisted us with the composition of groups within each class to ensure that the interviewees would feel comfortable in the interview setting. For instance, this could involve separating students who were likely to have more experience with substance use from those with less experience, and/or keeping friends together to encourage natural interactions. As the students reached the end of middle school (for both pilot and main study) we needed to strengthen the personal ties between interviewer and participants. This was important as future follow-ups would demand one-on-one interviews because the study would no longer be carried out in a shared school context. Individual interviews also facilitate a more private context for talking about sensitive themes and behaviour, such as the young people's own use of substances. Thus, the second (T3) and third (T4) follow-up

were conducted as personal interviews. In practice, this also allowed for an increased emphasis on personal experiences and meanings (Lambert & Loisel, 2008; Morse, 2003).

The combination of group and personal interviews may have contributed towards exploring specific opinions and experiences in more depth (Lambert & Loisel, 2008). Or as noted by Lambert and Loisel (2008, p. 235), *“When performed rigorously, the integration of individual interview and focus group data is a productive strategy that leads to an enhanced description of the phenomenon’s structure and its essential characteristics”*. The strategy has the advantage of first identifying a range of experiences, perceptions and perspectives, and then drawing from that pool to add more depth where needed (Lambert & Loisel, 2008). During the data collection, for example, this involved a systematic review of the data collected in the group interviews when making the interview guide for the individual interviews in order to develop new questions with a view to increasing our understanding.

Interview guide, semi-structured interviews and offer of payment

Apart from the baseline main study, I administered the ongoing qualitative data collections, and, together with colleagues, conducted interviews and wrote field notes at all time points. This enabled me to stress the importance of maintaining focus on the use of e-cigarettes during the continuous rounds of interviews when out in the field. Although the interviews were semi-structured, an interview guide were used to align the interviews. This was vital to ensure that the range of questions about e-cigarettes and vaping, in addition to other questions on tobacco products, alcohol and drugs, were asked in each interview. During the interviews, interviewees were also systematically asked questions that could provide context to their answers about e-cigarettes and other substances, such as their use of social media, leisure activities, relationships with friends and parents.

After having completed one round of interviews, new themes or associated dimensions often arose. As a measure, the interview guide was adjusted before each follow-up to ensure that we could further address and unpack relevant subthemes. In practice, this involved including additional questions on items such as e-cigarette flavours and places for purchasing vape products. In general, this procedure allowed for a thorough, yet flexible investigation of how Norwegian adolescents situated themselves in relation to these devices and associated practices at any given time. The overarching focus on substances, including e-cigarettes also remained the same throughout. Another unchanged feature during the course of the data collection was the emphasis on the use of open questions and empathic reactions. This was considered important for two reasons: First, we wanted all participating students to have a positive interview experience, which is vital in itself, but also can

serve to prevent avoidable attrition (for more information on the attrition, see article 3). Second, the consistent use of open-ended questions helped to produce ‘thick descriptions’ of the interviewees’ experiences (Geertz, 1973).

A shared honorarium of 2000 NOK (approximately £200) was given to each of the six participating classes upon each round of interviews during middle school, regardless of whether some adolescents declined to participate. After the adolescents transitioned from middle school to upper secondary school, participants were compensated individually with a gift card containing 300 NOK. Similar to my experiences from interviewing adult vapers, the effect of being able to offer symbolic payment to both schools and later to the participants individually, was valuable. During data collection when the adolescents were in middle school, this compensation seemed to make the school staff more willing to take part as the classes received something in return. When the participants were in upper secondary school, re-recruiting became more complicated as each needed to be contacted individually. In addition, many had moved, and all had changed schools. In this case, the individual honorarium is likely to have contributed towards maintaining the relatively low attrition rate at T4 (80 of 95 completed interviews). In general, being able to acknowledge the importance of their continuous participation and give participants something in return for their time and effort, had a positive effect on the interview setting.

In sum, the repeated interviews with adolescents provided data well suited to map and describe the complex social and cultural processes of meaning making associated with a novel phenomenon. Moreover, the combination of the longitudinal design and the sizeable and heterogeneous sample, make this a unique source for presenting an overview of how the vaping phenomenon is situated within the broader youth culture context in Norway.

Thematic data analysis

All interviews were recorded and later transcribed verbatim. Participants were given pseudonyms and identifying details were removed from transcripts to ensure confidentiality. The next step involved systematically coding the transcripts. The data corpus from the four rounds of interviews is coded using the qualitative research software, HyperResearch. This process involved categorization of data into several groups of codes that reflected themes within the interviews. Each group of codes involved several subcodes that reflected the stories presented by the adolescents. In addition to the coded transcripts, field notes, written after each interview contributed to the analysis by providing context to each interview, and provided an overview of the individual changes over time.

I have made particular use of the e-cigarette associated codes from the data body of source 2, involving items such as “own experience with e-cigarettes”, “typical users”, “risk perceptions” and

“reasons for use” (presented in article 3). I used thematic analysis to further search across these codes within the data set to find repeated patterns of meaning and identify additional themes at each time point (T1, T2, T3, and T4) (Braun & Clarke, 2006). The social meaning and status of e-cigarettes (transgression, cool/uncool) and the participants’ way of addressing aspects of e-cigarettes as objects (flavours, novel thing/old toy) occurred as patterned themes of importance. Both the social and the more product-related aspect seemed to capture something vital about the data relevant to each specific time. Next, I analysed how these themes evolved from early to older adolescence, by comparing how participants’ e-cigarette perceptions, attitudes and experiences varied between time points. The theoretical framework of ANT and IR were used in the final analysis of selected extracts and for the refinement of specific themes upon presentation (Braun & Clarke, 2006, p. 87). In article 3 of this thesis, I decided to present the analysed data chronologically to highlight the longitudinal aspect of the analysis and the evolving meaning of e-cigarettes. I also decided to include the voices of different participants rather than individual trajectories to show the overarching social meaning of e-cigarettes in the contemporary Norwegian youth culture.

I will return to the more formal ethical considerations of source 2 after I have presented the final source of data. As both the outlined source and the next origin from the same overarching (MyLife) study, the associated formal ethical considerations largely overlap. The connection between these datasets was also an important driver for inclusion of the next source, as the qualitative data illuminated aspects to adolescents’ use of e-cigarettes, such as temporality and use of e-cigarettes without nicotine, which could be investigated further in the related quantitative data.

Source 3: Quantitative longitudinal survey data with adolescents

Source 3 consists of data from 2975 adolescents who participated in the quantitative arm of the previously mentioned MyLife study. Of these, 2018 completed online questionnaires at all three time points: 2017 (T1), 2018 (T2) and 2019 (T3) (mean age: 14.2, 15 and 16.2).

Research design and data collection

The multi-cohort prospective quantitative arm was designed to investigate adolescents within their social contexts (i.e., families, schools) and with particular emphasis on examining mechanisms underlying developmental changes and transitions in substance use (Brunborg et al., 2019; Chassin, Sher, Hussong, & Curran, 2013; Ennett et al., 2008). The sampling strategy was developed to ensure a nationwide heterogeneous sample of adolescents. For geographical heterogeneity, one county in each of Norway's five geographical regions was selected for study inclusion (one from the north, middle, west, south, and east, respectively). In addition, and similar to the qualitative design, both urban and rural areas were included from each county. To ensure heterogeneity in standard of living, low, medium, and high SLI communities were selected based on the benchmark Standard of Living Index (SLI) from Statistics Norway. This index reflected community-level characteristics ranging from social security, single parent and disability payments to mortality and unemployment rates. These strategies ensured a sample that was both diverse and sizeable, which is a strength as it enables more precise estimates.

Baseline and follow-ups

T1: After ensuring parents and participants' consent (outlined under ethical considerations below), the first data collection was carried out autumn 2017. Teachers provided information and assisted the students during class. Participants were given access to the online questionnaires by typing in a Uniform Resource Locator (URL) in their web browsers. Of the 3512 enrolled students from 32 schools, 2975 completed the baseline assessment. The response rate for eighth, ninth and tenth graders was 88%, 81% and 85%, respectively (Brunborg et al., 2019). A contact person at each middle school also received 1000 Norwegian Kroner (approximately £100) as compensation for assisting with the data collection. In addition, each participating class received the same amount deposited into their class' savings account regardless of the individual response rates.

T2: The first follow-up (T2) was carried out by the 2018 autumn semester. For students who were still in middle school (n=2515), the data collection procedure remained the same as at baseline, with the exception that the teachers handed out notes with a preassigned PIN-code to enter in the questionnaire. Participants who had started upper secondary school were sent individual e-mail invitations with a link to the questionnaire. Three reminders were sent to non-responders via email

and text message during the autumn of 2018. For the 8th and 9th grade students who responded in the school setting, the response rate was 85.4% and 84.4%, respectively. For the first-year upper secondary students, the response rate was 72.3%. The first follow-up (T2) was completed by 2857 adolescents (81% of the cohort). Participants who continued to participate in upper secondary school were compensated individually with a 200 Norwegian Kroner gift card (approximately £20) each after completing the survey questionnaire.

T3: The second follow up (T3) was conducted during autumn 2019 and followed the same procedures as the previous year; Students in middle school completed the online questionnaire during school hours. Students who had graduated middle school (10th grade) were contacted individually and completed the questionnaire on their own time. A total of 2651 (75%) students completed the T3 questionnaire.

Identifying vaper groups and associated characteristics

The questionnaire addressed a wide range of topics, with a particular focus on family background, leisure time activities, personal characteristics, and substance use. An overview of the baseline questionnaire is available in Brunborg et.al. (2019). In this context, I was predominantly interested in topics from the questionnaire associated with use of e-cigarettes, and particularly the adolescents' use of e-cigarettes with or without nicotine. In addition, the aim was also to investigate whether those who reported use of e-cigarettes in general, and with nicotine in particular, differed from others concerning tobacco use and personal and behavioural characteristics. Based on this aim, the following strategic set of variables were included: age, gender, use of e-cigarettes (with or without nicotine), use of tobacco products (snus and cigarettes), sensation-seeking, depression and conduct problems (presented in article 4).

Age was an obvious variable, given the longitudinal design. In addition, the developmental phase of adolescence, characterized by physical, mental and psychosocial changes is generally an important period in terms of initiation of substance use (Forehand & Wierson, 1993). Gender and tobacco use were also deemed important in the context of vaping. In the ongoing debates over e-cigarettes as either a potential gateway to smoking or a diversion from smoking, these practices are commonly interlinked. Moreover, previous studies have found that boys try e-cigarettes more often than girls do, and adolescents with prior smoking experience more frequently use e-cigarettes compared to their non-smoking peers (Lundberg, Kvaavik, & Tokle, 2018; Treur, Rozema, Mathijssen, van Oers, & Vink, 2018). In addition to smoking, snus (moist smokeless tobacco) is available on the Norwegian market, and also currently the most popular nicotine product among Norwegian adolescents (ESPAD,

2020), which made inclusion of variables on use of snus particularly relevant when investigating vaping with and without nicotine in the Norwegian context.

To see if there are certain personal traits associated with adolescents who use e-cigarettes in the sample, the two variables, sensation seeking and depression, associated with the psychobiological approach, were selected. Sensation seeking is a trait that has been linked repeatedly to youth risk behavior, including cigarette smoking (Vallone, Allen, Clayton, & Xiao, 2007). A qualitative study has also found that adolescents report personal vaping in order to show opposition, which suggests that the use of e-cigarettes can serve as a marker of risk or transgression (Yule & Tinson, 2017). In some ways, this motive bears a resemblance to the sensation seeking trait, which is *“expressed in the generalized tendency to seek varied, novel, complex, and intense sensations and experiences and the willingness to take risks for the sake of such experiences”* (Zuckerman, 2010, p. 1). In the questionnaire, sensation seeking was measured based on the following four statements from the Brief Sensation Seeking Scale (BSSS-4): “I would like to explore strange places”; “I like to do frightening things”; “I like new and exciting experiences, even if I have to break the rules”; and “I prefer friends who are exciting and unpredictable” (Stephenson, Hoyle, Palmgreen, & Slater, 2003). Thus, because the BSSS-4 was previously found to be useful for identifying youth at risk for smoking (Vallone et al., 2007), we wanted to investigate whether this trait is also associated with vaping.

Similarly, variables measuring depression were included because smoking is found to be more widespread among people with depression and mental illnesses (Tjora et al., 2014; Smith et al., 2020). In addition, it can be of value for targeted prevention to investigate whether persons who suffer internal problems, such as depression, more frequently use e-cigarettes as well. Depression outcome was measured with the nine-item depression module from the Patient Health Questionnaire (PHQ-9) below (Spitzer, Kroenke & Williams, 1999).

Patient Health Questionnaire (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

Source: Spitzer, Kroenke & Williams, 1999.

Last but not least, early conduct problems have been identified as an important risk factor for substance use among young people (Jessor, Donovan, & Costa, 1994; Pedersen & Wichstroem, 1995). Conduct- or behaviour problems are commonly understood as deviating social norms shaped by the joint role of environmental forces, such as exposure to deviant peers, together with individual forces such as anti-social behaviour (Jessor et al., 1994, pp. 99-126). Substance use, including cigarette smoking and drinking alcohol, have previously been interlinked in the broader pattern of conduct problems among young people (Jessor, 1987). In this case, the aim was to investigate whether the use of e-cigarettes similarly occurs more frequently among adolescents who report behavior problems. In the questionnaire, behavior problems were measured based on the following 7 items: *destruction of property, lying, fighting, sneaking out of home, stealing, being loud and belligerent, and bullying others* in the past 12 months. Responses were structured by a four-point scale ranging from “Never” (coded 0) to “5 or more times” (coded 3).

In sum, the overarching aim for including the above variables was to enhance our knowledge about adolescents’ use of e-cigarettes with or without nicotine and to investigate user characteristics of adolescents who try e-cigarettes. For instance, we wanted to look at whether or not traits such as sensation seeking and depression, or engaging in problem behavior, play a role as additional explanatory factors for the use of e-cigarettes. The inclusion of the above-mentioned variables,

however, does not mean that I deem other variables unimportant, or that I believe the included ones provide a complete picture of youth vaping and vapers.

Data analysis

The statistical analyses were conducted by the first co-author Geir Scott Brunborg, PhD. As outlined in article 4, cross-sectional data were used to show the stability of prevalence estimates in the sample (table 1, paper 4). Chi² tests and one-way analysis were used to show variance and to assess group differences associated with vaping in the sample at baseline (T1). The sample was divided into four main user groups: vaping with nicotine; without nicotine, unaware of nicotine content; and non-user. These tests were followed by a set of regression models to compare how the different e-cigarettes status groups differed in use of tobacco products (snus and cigarettes) and individual characteristics (gender, age, sensation seeking, conduct problems and depression. For continuous variables (age, sensation-seeking, conduct problems and depression) across e-cigarette use status, linear predictions (margins) were calculated from four bivariate linear regression models. For categorical variables (gender, snus use status and smoking status), marginal mean probabilities were compared from a bivariate logistic regression model, and two bivariate multinomial logistic regression models, using Bonferroni correction to rule out false discoveries.

Longitudinal individual-level data are used in this context to show individual transitions in vaping pattern during the observation period. To address individual level patterns of e-cigarette use, the data analysis was restricted to the total of 2018 of the 2975 adolescent participants who had completed all three assessments (T1, T2, T3). These transitions were visualized by the second co-author, Tord Finne Vedøy, PhD, in a Sankey diagram by using the SankeyMATIC tool 38. Cohen's kappa was used to assess stability in the distribution of individuals over the four vaping categories.

As also shown in article 4, along with the associated tables and appendix, 957 of the 2975 participants were not available for follow-up. The missing data sample included more males (OR = 1.44, $p < 0.001$), persons with lower average level of depression ($b = -0.55$, $p = 0.010$) and they were more likely to have tried cigarettes (OR = 1.60, $p = 0.004$) compared to the remaining sample. In terms of age, sensation seeking, conduct problems, and snus use, they did not differ from the study sample.

The missing data can serve as a limitation of the data, although it is difficult to ascertain in what way. In addition, the sample was not drawn at random and data are not necessarily representative of the general population of adolescents. The survey data are also based on self-reports, which may lead to known biases such as selective recall and socially desirable responses, especially among young participants (Del Boca & Darkes, 2003). In addition, a significant number of adolescents did not

participate in the study because they did not return their parental consent forms. This also entailed that no information on them was obtained to inform as to how their non-participation may have affected the outcome. The importance of informed consent is further outlined in the next section.

Ethical considerations for longitudinal studies with adolescents

Sources 2 and 3, as part of the MyLife-project, received the approval of the Norwegian Data Protection Authority (DPA) (reference no.: 15/01495), after ethical evaluation by The National Committee for Research Ethics in the Social Sciences and the Humanities (reference no.: 2016/137). A general procedure was followed for both the quantitative and qualitative study to ensure that informed consent and participation was voluntary (NESH, 2016). Because of the respondents' young age (12-13) at study onset, and the follow-ups during middle school, informed parental consent was necessary before the adolescents could be asked to participate. The schools were given information packages containing a printed booklet describing the project in plain language, explicit consent form and a secure return envelope. Teachers at the various schools assisted by sharing information and handling consent forms. Students were asked to return completed consent forms in sealed envelopes to their teachers by a set date. Those with parental consent were then asked to consent to own participation immediately preceding the data collection (Brunborg et al., 2019). Participants 16 years of age and older were free to give their consent without informing their parents.

In terms of guaranteeing confidentiality for participants in the quantitative study, this was ensured by assigning them numbers. For the adolescents participating in the qualitative interviews, the persons transcribing anonymized the names of students, schools and locations as the recordings were transcribed. Recordings were also deleted after being transcribed. Moreover, information that could be sensitive and identifiable were also consequently left out of transcripts. The sizeable sample and longitudinal design of both studies, however, require that we maintain some vital information in order to contact participants again after finishing middle school and to link and compare individual data from time to time. These documents are safely stored at The Service for Sensitive Data (TSD) platform, in compliance with the Norwegian regulation regarding individual's privacy (TSD, 2016). The anonymized transcripts and fieldnotes are also only available to a small number of researchers involved in the MyLife-study.

A pragmatic rationale for use of multiple methods

As described, I have employed three different data collection methods in this thesis. Johnson, Onwuegbuzie, and Turner (2007) offer the following definition of mixed methods research as the type of research that “*combines elements of qualitative and quantitative research approaches (e.g. qualitative and quantitative viewpoints and data collection) for the purpose of breadth and depth of understanding and corroboration*” (p. 123). In the associated literature, the most common rationale for applying multiple-methods or mixed-methods approaches is a pragmatic one based on the questions that researchers seek to answer (Tashakkori & Teddlie, 2010; Tashakkori et al., 1998). In other words, the pragmatic justification for multiple-methods research can simply rely on an argument of utility of research means for research ends (Tashakkori & Teddlie, 2010, p. 96). In line with the above pragmatic orientation, I have employed the outlined sources as tools to investigate aspects of the vaping culture and social meaning of e-cigarettes. I have used qualitative methods to address how adult users who have lived through the shifting status of smoking understand vaping, guided by an aim to provide insights into the larger socio-cultural contexts of individuals (source 1). I have also used longitudinal qualitative methods to illuminate how adolescents as part of the post-smoking era perceive the meaning of e-cigarettes, and how these social meanings develop and progress over time (source 2). Finally, the longitudinal survey data have been used to investigate characteristics and patterns associated with use of e-cigarettes among adolescents (source 3).

In sum, the results from the integrated sources offer both depth and breadth in the understanding of the social meaning of e-cigarettes and the development of vaping cultures. The use of multiple methods within this thesis, however, does not mean that I have integrated the various data sources within the different articles. To the extent that this may be of value to future research, I will next offer a short summary of the main findings in the outlined sources.

4. Summary of the Research Articles

Chapter four provides a summary of the study findings, and highlights the thread of continuity in the thesis, which is a broad methodological and theoretical investigation of aspects of the vaping culture and the meaning of e-cigarette use. These findings occur in four journal articles. Article 1 and 2, offer insight into how adult users who have lived through the shifting status of smoking understand vaping. Article 3 and 4 contribute knowledge about how adolescents, as part of an all-time-low smoking generation, approach and apprehend e-cigarettes. In the following, I highlight each of the paper's original contribution to the field. In sum, these findings shed light on how adult vapers and adolescents currently negotiate and apprehend the social meaning of e-cigarettes in Norway. It also shows how the current thesis contribute with a multifaceted understanding of the culture of vaping.

Article 1

Tokle, R., & Pedersen, W. (2019). "Cloud chasers" and "substitutes": e-cigarettes, vaping subcultures and vaper identities. *Sociology of health & illness*, 41(5), 917-932.

The focus in the first article is on vaping cultures and vaper identities. The article is written against the backdrop of vaping as a new activity, which entails dealing with symbolic meanings and associated social practices that are still subject to negotiation. Findings are from Source 1 data, the semi-structured interviews with 30 adult e-cigarette users. In the study, the co-author and I investigate user motives, vapers' self-identity and involvement in vaping subcultures. We analyse the data according to subculture theory and the concepts of identity and stigma. We identify differing motivations of current e-cigarette users in Norway and find traces of a vaping subculture. In addition, we identify how vapers, through their differing motivations, hold different positions towards this subculture.

In order to highlight the variations and the associated dimensions, we constructed two ideal types that we labelled "cloud chasers" and "substitutes". Within the cloud chaser group, the social meaning of e-cigarettes had evolved from a smoking-cessation practice to a more complex lifestyle product. The vapers who identified with the emerging vaping subculture were generally enthusiastic and dedicated; they shared accounts of vaping as a pleasurable hobby, were often engaged in vaping-related activities on social media and had a sense of belonging to the vaping community. Based on opposition to current vaping policies, many were also politically engaged with a view to improving vaping regulation regimes. In contrast, within the substitute group, e-cigarettes were primarily used for smoking cessation in a more pragmatic and defensive manner, typically in order to

avoid health risks, to escape the stigma of smoking and to manage nicotine addiction. In this group, self-identity as a vaper was generally lacking and ambivalence was more often present. The latter occurred as a “split vision” of health and stigma in their perceptions: On the one hand, they would emphasize positive aspects such as improved health, successful smoking cessation and the pleasures of vaping. On the other, they commonly described vaping as an activity intrinsically linked to their nicotine addiction and as such, symbolically linked to the stigmatized smoker identity they wanted to escape. This was reflected in their user patterns. For instance, they preferred to hide their vaping and use discrete e-cigarettes. Interviewees placed within the substitute group also described the emerging vaping subculture, but in more negative terms. In contrast to the cloud chaser group, this group generally did not want to be identified with it. Thus, our findings suggest that the existing vaper subculture has played a positive and significant role for some vapers, but a negative one for others in terms of affecting their social meaning of vaping. Particularly the aesthetic and performance part of the subculture seems to have little mainstream appeal. Ultimately, Article 1 adds to the sparse literature on the culture of vaping and extends earlier studies as we unpack variations within vapers, social meanings of vaping, and we identify a vaping subculture.

Article 2

Tokle, R. (2020). Bottom-up meets top-down: exploring vapers' accounts of risk in a context of e-cigarette controversies. *Health, Risk & Society*, 1-18.

In Article 2, I use the same interview data to further investigate aspects of the “split vision” of health and stigma associated with vaping identified in Article 1. While the first paper addresses the differences in the sample, this study focuses on the evident unifying themes within these interviews. One relevant (and unintended) feature of the sample was that 29 of the 30 adult vapers were previous smokers. The relationship between vaping and smoking was brought up in all interviews and negotiated in various ways. In terms of risk perceptions and their view of the public risk communication and regulation of e-cigarettes, however, I identified a large overlap in their accounts. I decided to analyse the data according to a theoretical understanding of risk as a negotiated construct and against the broader context of e-cigarette divergence in society. Predominantly, three dimensions resonated across the data and user identities: first, they framed vaping as harm reduction, because the alternative for most of them was combustible cigarettes. Second, the interviewees commonly perceived health authorities and the Norwegian regulation as anti-vaping because of the current ban of nicotine in e-cigarettes. Third, and interlinked, they generally perceived lay expertise on the part of other vapers as more trustworthy than what they described as the disproportionately negative ‘top down’ risk communication from health authorities

and the media. The findings thus reveal that vapers experience a dissonance between their risk perceptions and the current regulation and more public risk-communication on use of e-cigarettes. Among these adult vapers, the use of e-cigarettes was compared to the relative risk of smoking and was thus construed as harm reduction, while the present regulations were seen as preventing access to a safer alternative to combustible cigarettes. Moreover, in contrast to the vapers' perception of e-cigarettes as a positive contribution to their health, they perceived the public risk communication as anti-vaping with an emphasis on risks and uncertainty. These dimensions that contributed to the outlined dissonance offer an understanding of the motives, including reactance, frustration and mistrust, which seem to drive some vapers to engage in self-advocacy, bottom-up movements and peer assistance. Finally, Article 2 illustrates how the mixed public approaches on e-cigarettes is a challenge in risk communication on vaping. In creating uncertainty, it can indirectly drive lay people to seek information from alternative sources, including biased echo chambers rather than health professionals.

Article 3

Tokle, R. (2020). 'Vaping and fidget-spinners': A qualitative, longitudinal study of e-cigarettes in adolescence. *International Journal of Drug Policy*, 82, 102791.

The third article explores the vaping phenomenon in the adolescent segment of the population. International studies have identified increasing use of e-cigarettes among young people. Against this backdrop, the aim of the study was to gain more knowledge on vaping among Norwegian adolescents. The study represents the first extensive qualitative, longitudinal study of adolescents' vaping in a context where e-cigarettes containing nicotine are banned. The article contributes to new understandings of the evolving meaning of vaping devices and usage among young people.

Based on a total of 50 group interviews and 175 individual interviews with 12–17-year-old boys and girls over four years, gradual and collective shifts in both vaping practices and the symbolic meaning of vaping were observed. The longitudinal findings were thematically analysed in the light of Actor-Network and interaction ritual theory. Three phases became evident: First, the 12–13-year-olds' accounts were marked by distance to the vaping phenomenon. Few had tried, although some were curious about the novel invention, flavours and practice. In the second phase, as the interviewees had turned 14–15, the distance was replaced by perceptions of vaping as a cool and established practice. One-third of the sample now reported having used vaping devices themselves; however, none reported vaping for nicotine. Instead, experimentation with vaping was driven by peer perceptions of novelty, status, emphasized harmlessness, performance, exposure and accessibility online. A third phase became evident at T3, where vaping had suddenly lost status and

was perceived by the currently 15–16-year-old participants as a childish and marginal activity. At T4 (16–17-year-olds), the collectively negotiated meaning framing vaping as an uncool, out-group practice was further established. E-cigarettes were compared with the trend-sensitive fidget-spinners and were associated with either kids or addicted adult smokers. The findings are presented with an awareness of the transitional social context, the sociability of vaping and the shifting meaning of e-cigarettes, inspired by the logic of IR and ANT. In summary, the study unpacked a systematic pattern whereby adolescents account for vaping as a time-limited trend. E-cigarettes, and the use of them, were devalued from novelty and transgression to childish and uninteresting within the same sample during a four-year period. While the most novel contribution from Article 3 was that vaping within the sample represented fashionable experimentation rather than steady user patterns, the study also raised awareness about use of e-cigarettes without nicotine in this age segment. This dimension of youth vaping called for additional systematic investigation of the proportion of adolescents using e-cigarettes with and without nicotine.

Article 4

Tokle, R., Brunborg, G.S. & Vedøy, T. (Revise and resubmit). Adolescents' use of Nicotine-free and Nicotine E-cigarettes: A longitudinal study of vaping transitions and vaper characteristics. Submitted to *Nicotine and Tobacco Research* Dec. 2020.

Data from the qualitative study presented in Article 3 raised some important questions relating to the use of nicotine in e-cigarettes among adolescents. The increase in youth vaping, particularly in the USA, has raised concerns about prolonged nicotine addiction in generations growing up in the post-smoking era. However, few studies differentiate between the use of e-cigarettes with and without nicotine, which is an important distinction when examining nicotine addiction. In Article 4, my co-authors and I, examine proportions, transitions and user characteristics in adolescents' vaping with and without nicotine using the Source 3 longitudinal survey data.

We found that while the overall prevalence of vaping was stable throughout the observation period, with an increase in nicotine vaping and a decrease in nicotine-free vaping, individual vaping patterns, both with and without nicotine, were transitional and marked by temporality. Furthermore, a large proportion of adolescent vapers used e-cigarettes without nicotine: Of the 15.6% of the participants who reported ever use of e-cigarettes at baseline (T1), 9.9% reported using without nicotine, with 3.2% reporting use with nicotine, and 2.5% to be unaware of nicotine content. In terms of the mentioned temporality: Within the group of nicotine vapers, 74.4% had quit vaping at T3. Within nicotine-free vapers, 69% had quit vaping, while 17% had become nicotine vapers at T3. Hence, in our paper, we also find that the majority of nicotine vapers became abstainers during the period.

In terms of characteristics we identified that compared to non-vapers, lifetime vapers – regardless of nicotine use – were more often males and were noted to have higher scores on sensation seeking, conduct problems and depression. When compared to non-nicotine vapers, nicotine vapers were more likely to use other tobacco products and had higher scores on sensation seeking, conduct problems and depression. Our findings show that while the majority of nicotine vapers also turn into non-users, these adolescents are still characterized by having more conduct problems, poorer mental health and more frequently use other tobacco products.

These findings show that that use of e-cigarettes seems to represent experimentation rather than steady user patterns in the sample. However, they also identify a difference between what can be interpreted as childish, light-transgressive and temporal use of e-cigarettes without nicotine, and the more problematic use of e-cigarettes with nicotine among adolescents, who seem to be more sensation seeking and to have more internalizing and externalizing problems to begin with.

5. Concluding Remarks

In my dissertation, I have offered a contribution to the growing body of social science literature on vaping behaviour. Applying a twofold focus on adults and adolescents, I have provided new empirical knowledge on vaping experiences and practices in Norway. The overarching research question has been *how can we understand the culture of vaping and social meaning of e-cigarettes?* Against the previous chapters and the four articles, the simplified answer is that we can understand the culture as fragmented, through the co-existence of a youth vaping culture, the visible vaping subculture and the more mainstream, pragmatic switcher culture. The exact social meaning and function of e-cigarettes will be determined by the subgroup of vapers we study. Experiences, motives, status and perceptions vary both within groups of adult vapers and between adults and adolescents. These distinctions are important: Former smokers' who currently vape emphasize the health benefit by switching. Adolescents instead describe vaping as a hype and seem to use e-cigarettes for experimentation, out of curiosity and as means by which to express status or opposition. This implies a need for nuanced understandings of the use of e-cigarettes, with room for parallel narratives.

In this concluding chapter, I discuss some plausible explanations for the cultural variation in vaping practices and their associated social meanings. Moreover, I reflect upon implications from my observations and offer some recommendations for future research.

Previous smokers versus a non-smoking generation

The consumer commitment to e-cigarettes represents something new and previously not seen in the tobacco landscape (Bell & Keane, 2012). In the thesis, I have made use of the cultural approach of meaning making and the subculture perspective to show this dimension, as well as to show that it is not unanimous (Gelder, 2005; Spillman, 2002). Identification, known as the basic mechanism by which to understand oneself in relation to others (Jenkins, 2014 p.14), is key for socialization into a group or a subculture and subsequent contributions to it (Fine and Kleinmain, 1979).

The vaper subculture in this context is a term referring to a distinct set of features such as visible enthusiasm, feelings of community, vaping practices with hobby dimensions – but also reactance, frustration and opposition towards what some vapers have deemed the more anti-vaping establishment. I argue that, depending on affiliation, the subculture can serve as both a driver and a barrier to vaping (Article 1, 2). This was evident in the way some adult vapers embraced the subcultural dimensions, such as the advanced practices, the community feeling, and displayed their “subcultural savvy” through extensive knowledge and field-specific argot (Thornton, 1995). While others in contrast, perceived the associated aesthetic as masculine, tacky, and subsequently

expressed fear that their vaping might make others associate them with it. Their lack of subcultural identification also tended to intersect with a preference for discrete use and products (Article 1).

In the interview data from adolescents, identification with e-cigarettes was a similarly important theme, but in relation to peers in this age segment. Experimenting with e-cigarettes occurred as a small part of a larger identity project. For a limited period, e-cigarettes carried the status of a valued symbol of membership at the centre of the adolescents' social attention (Collins, 2004). In early adolescence, for a young person to have tried the then cool and novel invention could be one way to express their "in the know" to peers (Thornton, 1995). In later adolescence, when e-cigarettes had been subject to a symbolic turnaround and labelled childish and untrendy, continuous vaping expressed the opposite. The process of devaluation serves to show how e-cigarettes lost their ritual value in parallel with their novel appeal (Collins, 2004). E-cigarettes were relegated to "the others", typically the younger adolescents or addicted smokers that aligns with Goffman's understanding of (discrediting) behaviour or attributes as essentially reflexive and socially constructed (2009). Moreover, it illuminates e-cigarettes position as independent consumer products relative to cigarettes in this age segment. Adolescents not only compared them to trend-sensitive gadgets and fresh toys (fidget spinners, yo-yos, new mobile phone); they also treated them as such by discarding them when the hype passed (Article 3). These findings indicate that aesthetic and novel features can be strong factors making e-cigarettes more acceptable and appealing to young people regardless of their smoking status (Lee, Lin, Seo, & Lohrmann, 2017).

The link to smoking – or lack of it, in the case of the adolescents – thus seems to affect meanings, user practices and motives. The connection between e-cigarettes and smoking was rarely present in the adolescents' accounts and few reported personal smoking experience (Article 3). This mirrors the situational frame of growing up in a post-smoking era (ESPAD, 2020). However, the way vaping was described as means for light transgression in early adolescence bears resemblance to meanings previously identified with youth smoking (see for instance, Scheffels 2009; Willis, 1977). Yet, the adolescents themselves seemed unaware of the association between these two practices (Article 3). In the adult sample, in contrast, vaping was inevitably interlinked with smoking. All but one turned out to be former smokers (Article 1, 2). This was made evident through a comparison of similarities and differences between the e-cigarettes/cigarettes and smoking/vaping. For example, my use of the term 'e-cigarette' was frequently contested during interviews because of its connotation to cigarettes. To distance themselves from cigarettes and smoking, interviewees preferred labels such as vaporizer, vape-pen or a mod. Often paired with the repeated mantra: "This is not smoking, its vaping". Simultaneously and in ways contradictory, harm reduction and replacing smoking were important motives for many. In the latter accounts, the similarities between these practices were

underlined, the strong point being that vaping enabled them to continue the ritual of inhaling nicotine, exhaling vapour and having a device to fumble with.

Emphasis on differences between smoking and vaping, as witnessed in the group of adult vapers, can be interpreted as boundary work driven by previous experiences of stigma (Copes, Hochstetler, & Williams, 2008). Vaping seems to offer the former smokers not only nicotine and pleasure, but also alternative identities, which at least some described as more culturally and socially acceptable (Farrimond, 2017; Notley & Collins, 2018). Despite e-cigarettes being the focal point during the interviews with adult vapers, the “*deeply discrediting*” stigma attached to smoking (Goffman, 2009, p. 3), was frequently brought up. Experiences of the shifting status of smoking occurred integrated in the adults’ repertoires of available meanings. Moreover, their portrayal of being a smoker in current society echoed studies that place smoking in the socioeconomic margins of society (Graham, 2012). Although some vapers in the more pragmatic substitute user group described transferring the stigma associated with smoking onto vaping, viewing e-cigarettes as a stigmatized symbol of their nicotine addiction. The subcultural participants, on the contrary, emphasized the independent features of vaping and stood forward as proud vapers.

The subcultural participants’ rejection of stigma and framing of vaping as a phenomenon that is misunderstood by ‘mainstream society’, echoes classical subcultural motives (Hall & Jefferson, 1993; Willis, 1977). Willis write, “*A pool of styles, meanings and possibilities are continuously reproduced and always available for those who turn in some way from the formalised and official accounts of their position*” (Willis [1977] in Gelder 2005 p. 113). Willis’ (1977) portrayal of oppositional working-class boys can be transferred to a contemporary analysis of vaping subculture as it show how resistance can be expressed by refusing to adopt to the norms and values appreciated by mainstream society. Thus, experiences of stigma associated with conventional smoking may explain some of the rejection, reactance and tension evident in the accounts of participants in vaping subcultures.

Split-risk approaches: a factor stimulating polarization?

Another contributing factor highlighted in this dissertation is understandings of the split-risk approach on the use of e-cigarettes between positive health effect vs stigma/harms. The complexity identified in vapers’ social identities, where vaping is embraced or rejected by some while others are indifferent to it (Farrimond, 2017), can be seen as mirroring e-cigarettes’ position within the general field of nicotine and tobacco science. In research, the polarization occurs when there is either a one-sided focus on e-cigarettes’ potential to reduce morbidity and mortality in smokers unable or unwilling to quit; *or* the potential for e-cigarettes to addict a new generation to nicotine (Carroll et al., 2021). In the public, the experience of a mixed scientific approach can result in confusion (Carroll

et al., 2021; Niaura, 2018). In vapers, divergent risk understandings seem to be a stimulating factor for vapers self-advocacy and involvement in vaping communities.

Split-risk approaches was a theme addressed by many of the adult vapers, where the divergence occurred as factors stimulating polarization. Particularly, the scientific concern over use by non-smokers and adolescents was often simplistically deemed 'anti-vaping'. In this group, vaping represented several things, but above all harm reduction (Article 2). Refusal to accept the narrative of e-cigarettes as a health risk can be directly related to their proclaimed fear of the potential regulatory outcomes from a focus on e-cigarettes as a threat to public health (Article 1, 2). Several of these vapers shed light on peer assistance in online vaper platforms and the preference for user experiences over scientific knowledge. Some, for instance, described vaper forums as the place to go for answers to e-cigarette related questions. Others said that they felt obliged to help current smokers by publishing vapers' stories of improved health on vaper forums and to counter negative arguments (Article 2). The findings show that internet has been vital to the vaper community by virtue of its ability to provide vapers easy access to networks of fellow vapers on global platforms, and echo studies of self-advocacy carried out in other countries (Annechino & Antin, 2016; Farrimond, 2016; Hagan & Donovan, 2013). Importantly, such community forums can further reinforce the polarization by occurring as echo chambers promoting and supporting certain views, which are bolstered when others repeat the same views.

For adolescents who are part of the nearly non-smoking generation (ESPAD, 2020), vaping has been subject to discredit for potential subsequent nicotine addiction, or for being a potential gateway to smoking (Chatterjee et al., 2016; Kinnunen et al., 2020). However, the adolescents in the current sample – despite being the social group at the core of much of the expressed concern, appeared to remain largely indifferent to the current regulation and unaware of the divergent positions on e-cigarettes (Carrol et al., 2021). This also reflects how vaping at the time of the study had a marginal appeal within the Norwegian youth culture. They typically described experimenting with e-cigarettes as 'tricks and fun' and using simple second-generation devices containing exotic, sweet flavours, but rarely nicotine.

The study thus shed light on a previously overlooked phenomenon concerning the use of e-cigarettes among adolescents, by identifying a segment of non-nicotine users among young vapers (Article 3, 4). This might provide a nuance to current understandings of youth vaping as related with subsequent nicotine addiction. Moreover, few adolescents in this study engage in stable vaping patterns. The absence of products containing nicotine – and hence subsequent addiction – might explain the instability in the user pattern. The fact that a majority of the adolescents who reported

vaping with nicotine also stopped using e-cigarettes during the observation period, can however be an indication that other factors, such as peer-negotiated social meanings can be of importance (Article 3, 4). The survey data also show that adolescents' use of e-cigarettes was associated with more frequent use of other tobacco products. Moreover, they shed light on how those who had tried vaping differed from never-users in terms of personal traits. These adolescents scored higher on sensation seeking and reported more internal and external problems. This might imply that e-cigarettes can be particularly appealing to "high-risk" youth with a disposition for risk-taking behaviour (e.g., impulsive personality, novelty-seeking tendency) in general, who also are susceptible to smoking initiation (Kozlowski & Warner, 2017; Vallone et al., 2007). It is however important to bear in mind the legal ban on e-liquids containing nicotine in Norway at the time of the study. The current regulation has likely limited the adolescents' access and exposure to for instance pod devices delivering nicotine which are found to appeal to young people in the USA (Huang et al., 2019). Nicotine use and vaping trajectories among Norwegian adolescents would perhaps have played out differently in a situation with better access. In addition, the Norwegian context is different from most other countries (except Sweden) in that snus is widely available and popular in this age segment (ESPAD, 2020).

Implications and Directions for Future Research

The identified variety marking the cultures and meaning of vaping, and the importance of factors such as age, peer influence, former smoker status and personal dispositions, are suitable to inform current understandings. The outlined findings above all suggest awareness of the variations in vaping approaches among adult vapers – as illustrated through the constructed *cloud chaser* and *substitute* identities – and between former smokers and adolescents. The understanding of the nuanced differences in the social meaning of e-cigarettes in various user groups may have implications for future research designs, for instance in how to adjust the study according to specific groups. Insight in various practices associated with different social groups can also inform more targeted intervention strategies in the field of tobacco control. Despite the decrease in smoking prevalence, smoking remains a significant health issue, particularly among older people with low socio-economic status (Grøtvedt et al., 2017; Lund, 2016).

The current findings may also contribute to inform future e-cigarette-related communication and policy. For risk information to be accepted, the target group must trust the credibility of the messenger, and credibility can be achieved through insight (Mayer, Davis, & Schoorman, 1995). The current findings suggest that adjusted communication could be of value to accommodate specific groups, rather than a single-track approach towards all users of e-cigarettes. This may mean, for example, that smokers should be made aware of the relative risk between smoking and vaping, while

adolescents should be informed of the risk of vaping based on comparison with non-use. Moreover, based on the EVALI-experience, adolescents should perhaps also be subject to targeted information about the risk from purchasing THC-oils for vaping of the black market (Hall, Gartner & Bonevski, 2020).

Essentially, these findings – the range in meanings, vaper identities, user motives, practices and user patterns – are rooted in a specific social context, at a specific time and within specific groups. To be exact, the current PhD study is situated and carried out in Norway. During this period (2014-2019), the vaping prevalence, both among adults and adolescents has remained relatively low. This may be related to the current ban on nicotine e-cigarettes in domestic shops, but also to the availability and widespread use of snus in Norway. Like e-cigarettes, snus can provide a safer alternative for nicotine intake compared to combustible cigarettes (Lund & Vedoy, 2019). And in contrast to e-cigarettes, snus is a more discrete, standardized nicotine product, currently popular and well established in the market (Lund & Vedoy, 2019). Additional studies investigating the culture of vaping and social meaning within social groups situated in different contexts, is vital to further inform the issues at hand. Several interesting and important dimensions related to e-cigarettes also extended the scope and the associated data of this thesis. The novelty and the unsettled nature of the phenomenon in focus, together with forthcoming regulatory changes in Norway, make it reasonable to anticipate further changes. Continuous investigation and monitoring of e-cigarette use within various groups in Norway is therefore also vital. Below, I outline some proposals for future research based on acknowledgement of certain shortcomings of the present thesis and some of the current research gaps in Norway.

- *Gender*

Use of e-cigarettes from a gender perspective could provide additional insight. Despite having attempted to balance gender representation in the samples, the issue of gender has not been given focused attention in this thesis. The findings imply that gender differences occur within the vaping phenomenon. More boys than girls report use of e-cigarettes (Article 4). Some rejected the vaping subculture as stereotypically masculine (Article 1). Future research could consider more focused questions on gender in interviews or include separate gender analyses to increase insight into pertinent differences in use, patterns and perceptions.

- *Vaping for THC or other substances*

Vaping behaviour involves smoking cessation, vaping for tricks and flavours alone, but can also serve as means to inhale THC-oil (Barrington-Trimis & Leventhal, 2018; Hall et al., 2020; Hardcastle et al., 2014; Knapp et al., 2019; Measham et al., 2016; Pepper, Farrelly, & Watson, 2018; Pepper et al., 2017). There is a need to further investigate alternative vaping behaviour and motives including vaping to consume cannabis and other drugs. Assuming the phenomenon has low prevalence, this may require targeted samples.

- *Vaping for smoking cessation among current smokers*

There is a large degree of consensus about the health advantages for smokers who switch to e-cigarettes (Gilreath et al., 2016); however, we lack individual data that investigate such transitions over time in Norway. Longitudinal studies, both quantitative and qualitative, could be of value to enhance insight into cessation trajectories and evolving experiences and meaning-making processes among smokers switching to e-cigarettes.

- *Use of e-cigarettes among adolescents and adults in Norway after TPD implementation*

The expected implementation of TPD in Norway will lift the current ban on nicotine and subsequently make internationally popular nicotine pods such as the JUUL accessible on the domestic market. This should make it a priority to provide knowledge about how the altered legislation impact smokers, vapers and current non-users in terms of prevalence, practices and social meanings of e-cigarettes should.

Conclusion

In taking a cultural and sociological approach, and by using a range of theoretical perspectives (Collins, 2014; Gelder, 2005; Latour, 2005; Lupton, 1999; Spillman, 2002), this thesis provides support for undertaking a multiple-lens approach when investigating novel phenomena in order to illuminate a broader spectrum of dimensions. It also highlights the importance of avoiding conformist understandings of the meaning of e-cigarettes and acknowledging intra-vaper and intra-cultural differences in empirical studies on usage. By studying adults with lived experience and a broader adolescent sample over time, and from various angles, this study adds nuances to the current understanding of e-cigarette use. In particular, I reveal the importance of variables such as age, previous smoker status and social context in terms of meaning making processes and vaping practices. For adults, vaping implies harm reduction, but also additional and more advanced vaper practices. For adolescents, vaping can involve both seemingly innocent consumer practices marked by temporality and be associated with other internal and external problems. In sum, the outcome is the coexistence of several and sometimes-contradictory social meanings of e-cigarettes. Currently

they represent both harm reduction *and* risk; are interlinked with cigarettes *and* independent consumer products; used regularly *or* for experimentation, with, *and* without nicotine. Insight into these co-occurring meanings – both within and between various vaper cultures – can contribute to inform future research and prevention policies.

References

- Annechino, R., & Antin, T. (2016). Taking sides in E-cigarette research. In *Ethnographic Praxis in Industry Conference Proceedings* (Vol. 2016, No. 1, pp. 105-119).
- ASH. Action on smoking and health. (2019). *Use of e-cigarettes among young people in Great Britain*. Retrieved from <https://ash.org.uk/wp-content/uploads/2019/06/ASH-Factsheet-Youth-E-cigarette-Use-2019.pdf>
- Ayres, L., Kavanaugh, K., & Knafl, K. A. (2003). Within-case and across-case approaches to qualitative data analysis. *Qualitative Health Research*, 13(6), 871-883.
- Barbeau, A. M., Burda, J., & Siegel, M. (2013). Perceived efficacy of e-cigarettes versus nicotine replacement therapy among successful e-cigarette users: a qualitative approach. *Addiction Science & Clinical Practice*, 8, 5.
- Bareham, D., Ahmadi, K., Elie, M., & Jones, A. W. (2016). E-cigarettes: controversies within the controversy. *The Lancet Respiratory Medicine*, 4(11), 868-869.
- Bareham, D., Ahmadi, K., Elie, M., Jones, A. W., & McKee, M. (2018). E-cigarettes: further flavours of controversy within the controversy. *The Lancet Respiratory Medicine*, 6(1), 16-17.
- Barrington-Trimis, J. L., & Leventhal, A. M. (2018). Adolescents' Use of "Pod Mod" E-Cigarettes—Urgent Concerns. *New England Journal of Medicine*.
- Bell, K., & Keane, H. (2012). Nicotine control: E-cigarettes, smoking and addiction. *International Journal of Drug Policy*, 23(3), 242-247.
- Bell, K., & Keane, H. (2014). All gates lead to smoking: the 'gateway theory', e-cigarettes and the remaking of nicotine. *Social Science and Medicine*, 119, 45-52.
- Bell, K., Salmon, A., Bowers, M., Bell, J., & McCullough, L. (2010). Smoking, stigma and tobacco 'denormalization': Further reflections on the use of stigma as a public health tool. A commentary on Social Science & Medicine's Stigma, Prejudice, Discrimination and Health Special Issue (67: 3). *Social Science and Medicine*, 70(6), 795-799.
- Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste*: Harvard university press.
- Branston, J. R., & Sweanor, D. (2016). Big tobacco, E-cigarettes, and a road to the smoking endgame. *International Journal of Drug Policy*, 29, 14-18.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.
- Britton, J., Arnott, D., McNeill, A., Hopkinson, N., & Tobacco Advisory Group of the Royal College of P. (2016). Nicotine without smoke—putting electronic cigarettes in context. *BMJ*, 353.
- Brunborg, G. S., Scheffels, J., Tokle, R., Buvik, K., Kvaavik, E., & Burdzovic Andreas, J. (2019). Monitoring young lifestyles (MyLife) - a prospective longitudinal quantitative and qualitative study of youth development and substance use in Norway. *BMJ Open*, 9(10).
- Carroll, D. M., Denlinger-Apte, R. L., Dermody, S. S., King, J. L., Mercincavage, M., Pacek, L. R., . . . White, C. M. (2021). Polarization within the field of tobacco and nicotine science and its potential impact on trainees. *Nicotine and Tobacco Research*, 23(1), 36-39.
- Chapman, S., Bareham, D., & Maziak, W. (2019). The gateway effect of e-cigarettes: reflections on main criticisms. *Nicotine and Tobacco Research*, 21(5), 695-698.
- Chapman, S. L. C., & Wu, L.-T. (2014). E-cigarette prevalence and correlates of use among adolescents versus adults: a review and comparison. *Journal of Psychiatric Research*, 54, 43-54.
- Charmaz, K. (2014). *Constructing grounded theory*, 2nd edn., SAGE, London.
- Charmaz, K. (2017). Special invited paper: Continuities, contradictions, and critical inquiry in grounded theory. *International journal of qualitative methods*, 16(1).
- Charmaz, K., & Belgrave, L. L. (2007) in Ritzer, G. (Ed.). *The Blackwell encyclopedia of sociology*. Vol. (1479). New York, NY, USA: Blackwell Publishing

- Chassin, L., Sher, K. J., Hussong, A., & Curran, P. (2013). The developmental psychopathology of alcohol use and alcohol disorders: Research achievements and future directions. *Development and Psychopathology*, 25(4 0 2), 1567.
- Chatterjee, K., Alzghoul, B., Innabi, A., & Meena, N. (2016). Is vaping a gateway to smoking: a review of the longitudinal studies. *International Journal of Adolescent Medicine and Health*, 30(3).
- Clarke, G. (1982). "Defending ski-jumpers: a critique of theories of youth sub-cultures". In Frith S. & Goodwin A. (Ed.) *On Record: Rock, Pop and the Written Word*, 1990, 68–80. London: Routledge
- Collins, R. (2014). *Interaction ritual chains* (Vol. 62): Princeton university press.
- COT. Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment . (2020). *Statement on the potential toxicological risks from electronic nicotine (and non-nicotine) delivery systems (E(N)NDS—e-cigarettes)*. Retrieved from: <https://cot.food.gov.uk/sites/default/files/202009/COT%20E%28N%29NDS%20statement%202020-04.pdf> (Acceded: 13.01.2021).
- Copes, H., Hochstetler, A., & Williams, J. P. (2008). "We Weren't Like No Regular Dope Fiends": Negotiating Hustler and Crackhead Identities1. *Social Problems*, 55(2), 254-270.
- Cressey, P. G. (2008). *The taxi-dance hall: A sociological study in commercialized recreation and city life*: University of Chicago Press.
- Creswell, J. W. (2007). *Qualitative Inquiry and Research Design. Choosing Among Five Approaches* (Second ed.). USA: SAGE Publications.
- Cullen, K. A., Gentzke, A. S., Sawdey, M. D., Chang, J. T., Anic, G. M., Wang, T. W., . . . King, B. A. (2019). e-Cigarette Use Among Youth in the United States, 2019. *JAMA*, 322(21), 2095-2103.
- Dave, D., Dench, D., Kenkel, D., Mathios, A., & Wang, H. (2020). News that takes your breath away: risk perceptions during an outbreak of vaping-related lung injuries. *Journal of Risk and Uncertainty*, 60(3), 281-307.
- Del Boca, F. K., & Darkes, J. (2003). The validity of self-reports of alcohol consumption: state of the science and challenges for research. *Addiction*, 98, 1-12.
- Delnevo, C. D., Giovenco, D. P., Steinberg, M. B., Villanti, A. C., Pearson, J. L., Niaura, R. S., & Abrams, D. B. (2016). Patterns of electronic cigarette use among adults in the United States. *Nicotine & Tobacco Research*, 18(5), 715-719.
- Drope, J., Schluger, N., Cahn, Z., Drope, J., Hamill, S., Islami, F., . . . Stoklosa, M. (2018). *The tobacco atlas*. Atlanta: American Cancer Society and Vital Strategies; 2018.
- Dutra, L. M., & Glantz, S. A. (2017). E-cigarettes and National Adolescent Cigarette Use: 2004-2014. *Pediatrics*, 139(2).
- Ennett, S. T., Foshee, V. A., Bauman, K. E., Hussong, A., Cai, L., Reyes, H. L. M., . . . DuRant, R. (2008). The social ecology of adolescent alcohol misuse. *Child Development*, 79(6), 1777-1791.
- ESPAD. (2020). *ESPAD Report 2019: Results from the European School Survey Project on Alcohol and Other Drugs*. Retrieved from Publications Office of the European Union, Luxembourg:
- Etter, J.F. (2016). Characteristics of users and usage of different types of electronic cigarettes: findings from an online survey. *Addiction*, 111(4), 724-733.
- Farrimond, H. (2016). E-cigarette regulation and policy: UK vapers' perspectives. *Addiction*, 111(6), 1077-1083.
- Farrimond, H. (2017). A typology of vaping: Identifying differing beliefs, motivations for use, identity and political interest amongst e-cigarette users. *International Journal on Drug Policy*, 48, 81-90.
- Farrimond, H., & Joffe, H. (2006). Pollution, peril and poverty: a British study of the stigmatization of smokers. *Journal of Community & Applied Social Psychology*, 16(6), 481-491.
- Farrimond, H., Joffe, H., & Stenner, P. (2010). A Q-methodological study of smoking identities. *Psychology & Health*, 25(8), 979-998.
- Fine, G. A., & Kleinman, S. (1979). Rethinking subculture: An interactionist analysis. *American journal of sociology*, 85(1), 1-20.

- FDA. U.S. Food & Drug Administration. (2018). "Statement from FDA commissioner Scott Gottlieb, MD, on proposed new steps to protect youth by preventing access to flavored tobacco products and banning menthol in cigarettes". *FDA STATEMENT*, 11/15/2018. Retrieved from: <https://www.fda.gov/news-events/press-announcements/statement-fda-commissioner-scott-gottlieb-md-proposed-new-steps-protect-youth-preventing-access> (Accessed: 3.02.2021)
- Forehand, R., & Wierson, M. (1993). The role of developmental factors in planning behavioral interventions for children: Disruptive behavior as an example. *Behavior Therapy*, 24(1), 117-141.
- Geertz, C. (1973). "Thick description: Toward an interpretive theory of culture". In *The interpretation of cultures*, 3–30. New York: Basic Books.
- Gelder, K. (2005). *The subcultures reader*: Psychology Press.
- Gilreath, T. D., Leventhal, A., Barrington-Trimis, J. L., Unger, J. B., Cruz, T. B., Berhane, K., . . . Howland, S. (2016). Patterns of alternative tobacco product use: emergence of hookah and e-cigarettes as preferred products amongst youth. *Journal of Adolescent Health*, 58(2), 181-185.
- Glaser, B.G. and Strauss, A.L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Aldine, Chicago, IL.
- Goffman, E. (2009). *Stigma: Notes on the management of spoiled identity*: Simon and Schuster.
- Goniewicz, M. L., Gawron, M., Nadolska, J., Balwicki, L., & Sobczak, A. (2014). Rise in electronic cigarette use among adolescents in Poland. *Journal of Adolescent Health*, 55(5), 713-715.
- Gordon, M. M. (1947). The concept of the sub-culture and its application. *Soc. F.*, 26, 40.
- Graham, H. (2012). Smoking, stigma and social class. *Journal of Social Policy*, 41(1), 83-99.
- Grøtvedt, L., Kvalvik, L. G., Grøholt, E.-K., Akerkar, R., & Egeland, G. M. (2017). Development of social and demographic differences in maternal smoking between 1999 and 2014 in Norway. *Nicotine & Tobacco Research*, 19(5), 539-546.
- Guba, E. G. (1990). *The paradigm dialog*. Newbury Park: Sage Publications, Inc.
- Gubrium, J. F., & Holstein, J. A. (2003). *Postmodern interviewing*: Sage.
- Hagan, T. L., & Donovan, H. S. (2013). Self-advocacy and cancer: a concept analysis. *Journal of Advanced Nursing*, 69(10), 2348-2359.
- Hajek, P., Etter, J. F., Benowitz, N., Eissenberg, T., & McRobbie, H. (2014). Electronic cigarettes: review of use, content, safety, effects on smokers and potential for harm and benefit. *Addiction*, 109(11), 1801-1810.
- Hajek, P., Pittaccio, K., Pesola, F., Myers Smith, K., Phillips-Waller, A., & Przulj, D. (2020). Nicotine delivery and users' reactions to Juul compared with cigarettes and other e-cigarette products. *Addiction*, 115(6), 1141-1148.
- Hall, W., Gartner, C., & Bonevski, B. (2020). Lessons from the public health responses to the US outbreak of vaping-related lung injury. *Addiction*.
- Hall, S., & Jefferson, T. (1993). *Resistance through rituals: Youth subcultures in post-war Britain* (Vol. 7): Psychology Press.
- Hardcastle, K., Hughes, K., Worsley, J., Bennett, A., Ireland, R., & Sweeney, S. (2014). Most people I know have got one: Young people's perceptions and experiences of electronic cigarettes. centre for Public Health. *Liverpool John Moores University*, 1-31.
- Hartmann-Boyce, J., McRobbie, H., Lindson, N., Bullen, C., Begh, R., Theodoulou, A., . . . et al. (2020). Electronic cigarettes for smoking cessation. *Cochrane database of systematic reviews*(10).
- Hebdige, D. (1979). *Subculture: The meaning of style*. New York: Routledge.
- Huang, J., Duan, Z., Kwok, J., Binns, S., Vera, L. E., Kim, Y., . . . Emery, S. L. (2019). Vaping versus JUULing: how the extraordinary growth and marketing of JUUL transformed the US retail e-cigarette market. *Tobacco Control*, 28(2), 146-151.
- Islami, F., Torre, L. A., & Jemal, A. (2015). Global trends of lung cancer mortality and smoking prevalence. *Translational lung cancer research*, 4(4), 327.

- Jessor, R. (1987). Problem-behavior theory, psychosocial development, and adolescent problem drinking. *British Journal of Addiction*, 82(4), 331-342.
- Jessor, R., Donovan, J. E., & Costa, F. M. (1994). *Beyond adolescence: Problem behaviour and young adult development*: Cambridge University Press.
- Jessor, R., & Jessor, S. L. (1977). *Problem behavior and psychosocial development: A longitudinal study of youth*: New York: Academic Press.
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of mixed methods research*, 1(2), 112-133.
- Kahn, R., & Kellner, D. (2004). New media and internet activism: from the 'Battle of Seattle' to blogging. *New media & society*, 6(1), 87-95.
- Kalkhoran, S., & Glantz, S. A. (2015). Modeling the health effects of expanding e-cigarette sales in the United States and United Kingdom: a Monte Carlo analysis. *JAMA internal medicine*, 175(10), 1671-1680.
- Kamerow, D. (2013). Big Tobacco lights up e-cigarettes. *BMJ*, 346.
- Kennedy, R. D., Awopegba, A., De León, E., & Cohen, J. E. (2017). Global approaches to regulating electronic cigarettes. *Tobacco Control*, 26(4), 440-445.
- King, B. A., Patel, R., Nguyen, K. H., & Dube, S. R. (2015). Trends in awareness and use of electronic cigarettes among US adults, 2010-2013. *Nicotine Tob Res*, 17(2), 219-227.
- Kinnunen, J. M., Rimpelä, A. H., Lindfors, P. L., Clancy, L., Alves, J., Hoffmann, L., . . . Lorant, V. (2020). Electronic cigarette use among 14-to 17-year-olds in Europe. *European Journal of Public Health*, 2020; ckaa 145.
- Klein, R. (1995). *Cigarettes are sublime*: Duke University Press.
- Knapp, A. A., Lee, D. C., Borodovsky, J. T., Auty, S. G., Gabrielli, J., & Budney, A. J. (2019). Emerging trends in cannabis administration among adolescent cannabis users. *Journal of Adolescent Health*, 64(4), 487-493.
- Kozlowski, L. T., & Warner, K. E. (2017). Adolescents and e-cigarettes: Objects of concern may appear larger than they are. *Drug and Alcohol Dependence*, 174, 209-214.
- Lambert, S. D., & Loiselle, C. G. (2008). Combining individual interviews and focus groups to enhance data richness. *Journal of Advanced Nursing*, 62(2), 228-237.
- Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Harvard university press.
- Latour, B. (1994). On technical mediation: philosophy, sociology, genealogy. *Common Knowledge* 3 (2), pp. 29– 64.
- Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory*: Oxford university press.
- Layden, J. E., Ghinai, I., Pray, I., Kimball, A., Layer, M., Tenforde, M. W., . . . Elderbrook, M. (2020). Pulmonary illness related to e-cigarette use in Illinois and Wisconsin. *New England Journal of Medicine*, 382(10), 903-916.
- Lee, H.Y., Lin, H.C., Seo, D.-C., & Lohrmann, D. K. (2017). Determinants associated with E-cigarette adoption and use intention among college students. *Addictive Behaviors*, 65, 102-110.
- Levy, D. T., Lindblom, E. N., Sweanor, D. T., Chaloupka, F., O'Connor, R. J., Shang, C., . . . Goniewicz, M. L. (2019). An economic analysis of the Pre-Deeming us market for nicotine Vaping products. *Tobacco Regulatory Science*, 5(2), 169-181.
- Li, B., Réhman, S., & Li, H. (2011). i-Function of Electronic Cigarette: Building Social Network by Electronic Cigarette. In *2011 International Conference on Internet of Things and 4th International Conference on Cyber, Physical and Social Computing* (pp. 634-637). IEEE.
- Lund, K. E., & Vedoy, T. F. (2019). Relative risk perceptions between snus and cigarettes in a snus-prevalent society—an observational study over a 16 year period. *International Journal of Environmental Research and Public Health*, 16(5), 879.
- Lund, M. (2016). *Smoking in a non-smoking environment*. Doctoral dissertation, Department of Sociology and Human Geography, University of Oslo.

- Lund, M., Lund, K. E., & Halkjelsvik, T. (2014). Contrasting smokers' and snus users' perceptions of personal tobacco behavior in Norway. *Nicotine & Tobacco Research*, *16*(12), 1577-1585.
- Lundberg, C. S., Kvaavik, E., & Tokle, R. (2018). Nye bruksmønstre i et tobakksmarked i endring– kombinert bruk av sigaretter, snus og e-sigaretter blant ungdom. *Nordic Studies on Alcohol and Drugs*, 1455072518797823.
- Lupton, D. (1999). *Risk and sociocultural theory: New directions and perspectives*: Cambridge University Press.
- Löwe, B., Kroenke, K., Herzog, W., & Gräfe, K. (2004). Measuring depression outcome with a brief self-report instrument: sensitivity to change of the Patient Health Questionnaire (PHQ-9). *Journal of Affective Disorders*, *81*(1), 61-66.
- Mathur, A., & Dempsey, O. J. (2018). Electronic cigarettes: a brief update. *Journal of the Royal College of Physicians of Edinburgh*, *48*(4), 346-351.
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, *20*(3), 709-734.
- McArthur, J. A. (2009). Digital subculture: A geek meaning of style. *Journal of communication inquiry*, *33*(1), 58-70.
- McCausland, K., Jancey, J., Leaver, T., Wolf, K., Freeman, B., & Maycock, B. (2020). Motivations for use, identity and the vaper subculture: a qualitative study of the experiences of Western Australian vapers. *BMC Public Health*, *20*(1), 1-14.
- McMillen, R. C., Gottlieb, M. A., Shaefer, R. M., Winickoff, J. P., & Klein, J. D. (2015). Trends in Electronic Cigarette Use Among U.S. Adults: Use is Increasing in Both Smokers and Nonsmokers. *Nicotine Tob Res*, *17*(10), 1195-1202.
- McNeill, A., Brose, L. S., Calder, R., Hitchman, S. C., Hajek, P., & McRobbie, H. (2015). Ann McNeill and colleagues reply to Martin McKee and Simon Capewell. *BMJ*, *351*, h5010.
- McNeill, A., Brose, L. S., Calder, R., Bauld, L., & Robson, D. (2019). *Vaping in England: an evidence update February 2019*. Public Health England (PHE) London.
- McRobbie, H., Bullen, C., Hartmann-Boyce, J., & Hajek, P. (2014). Electronic cigarettes for smoking cessation and reduction. *Cochrane database of systematic reviews*(12).
- Measham, F., O'Brien, K., & Turnbull, G. (2016). "Skittles & Red Bull is my favourite flavour": E-cigarettes, smoking, vaping and the changing landscape of nicotine consumption amongst British teenagers—implications for the normalisation debate. *Drugs: Education, Prevention and Policy*, *23*(3), 224-237.
- Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*: John Wiley & Sons.
- Morean, M. E., Camenga, D. R., Bold, K. W., Kong, G., Jackson, A., Simon, P., ... & Krishnan-Sarin, S. (2020). Querying about the use of specific e-cigarette devices may enhance accurate measurement of e-cigarette prevalence rates among high school students. *Nicotine and Tobacco Research*, *22*(5), 833-837.
- Morse, J. M. (2003). Principles of mixed methods and multimethod research design. *Handbook of mixed methods in social and behavioral research*, *1*, 189-208.
- NESH. (2016). *Guidelines for Research Ethics in the Social Sciences, Humanities, Law and Theology*. Retrieved from https://www.forskningsetikk.no/globalassets/dokumenter/4-publikasjoner-som-pdf/60127_fek_guidelines_nesh_digital.pdf
- Niaura, R. (2018). E-cigarette science and its relevance for regulatory actions and policy. *Nicotine & Tobacco Research*.
- Notley, C., & Collins, R. (2018). Redefining smoking relapse as recovered social identity—secondary qualitative analysis of relapse narratives. *Journal of Substance Use*, *23*(6), 660-666.
- Park, R. E. (1915). The city: Suggestions for the investigation of human behavior in the city environment. *American journal of sociology*, *20*(5), 577-612.
- Pedersen, W., & Wichstroem, L. (1995). Patterns of delinquency in Norwegian adolescents. *The British Journal of Criminology*, *35*(4), 543-562.

- Pepper, J. K., & Brewer, N. T. (2014). Electronic nicotine delivery system (electronic cigarette) awareness, use, reactions and beliefs: a systematic review. *Tobacco Control*, 23(5), 375-384.
- Pepper, J. K., Farrelly, M. C., & Watson, K. A. (2018). Adolescents' understanding and use of nicotine in e-cigarettes. *Addictive Behaviors*, 82, 109-113.
- Pepper, J. K., Lee, Y. O., Watson, K. A., Kim, A. E., Nonnemaker, J. M., & Farrelly, M. C. (2017). Risk Factors for Youth E-Cigarette "Vape Trick" Behavior. *Journal of Adolescent Health*, 61(5), 599-607.
- Peretti-Watel, P., Legleye, S., Guignard, R., & Beck, F. (2014). Cigarette smoking as a stigma: evidence from France. *International Journal on Drug Policy*, 25(2), 282-290.
- Polosa, R. (2015). E-cigarettes: Public Health England's evidence based confusion?. *The Lancet*, 386(10000), 1237-1238.
- Rahman, M. A., Hann, N., Wilson, A., & Worrall-Carter, L. (2014). Electronic cigarettes: patterns of use, health effects, use in smoking cessation and regulatory issues. *Tobacco Induced Diseases*, 12(1), 21.
- Ramamurthi, D., Chau, C., & Jackler, R. K. (2019). JUUL and other stealth vaporisers: hiding the habit from parents and teachers. *Tobacco Control*, 28(6), 610-616.
- Ritzer, G. (2000). *Sociological Theory* (5 ed.). the United States: McGraw-Hill Higher Education.
- Rogers, E. M. (2010). *Diffusion of innovations*: Simon and Schuster.
- Saldaña, J. (2003). *Longitudinal qualitative research: Analyzing change through time*: Rowman Altamira.
- Sandberg, S. (2013). Cannabis culture: A stable subculture in a changing world. *Criminology & Criminal Justice*, 13(1), 63-79.
- Scheffels, J. (2009). Stigma, or sort of cool: Young adults' accounts of smoking and identity. *European Journal of Cultural Studies*, 12(4), 469-486.
- Scheffels, J., & Lund, I. (2017). Cute as candy: a qualitative study of perceptions of snus branding and package design among youth in Norway. *BMJ Open*, 7(4), e015888.
- Scheffels, J., & Tokle, R. (2017). 'Addicted to being cool': occasional smoking in a western context of tobacco denormalization. *Addict Res Theory*, 25(5), 368-374.
- Schoenborn, C. A., & Gindi, R. M. (2015). Electronic cigarette use among adults: United States, 2014. *Journal of Preventive Medicine*, 50(4), 472-475.
- Siegel, M. B., Tanwar, K. L., & Wood, K. S. (2011). Electronic cigarettes as a smoking-cessation tool: results from an online survey. *American Journal of Preventive Medicine*, 40(4), 472-475.
- Smets, J., Baeyens, F., Chaumont, M., Adriaens, K., & Van Gucht, D. (2019). When less is more: vaping low-nicotine vs. high-nicotine e-liquid is compensated by increased wattage and higher liquid consumption. *International Journal of Environmental Research and Public Health*, 16(5), 723.
- Smith, P. H., Chhipa, M., Bystrick, J., Roy, J., Goodwin, R. D., & McKee, S. A. (2020). Cigarette smoking among those with mental disorders in the US population: 2012–2013 update. *Tobacco Control*, 29(1), 29-35.
- Spillman, L. (2002). *Cultural Sociology*. Great Britain: Blackwell Malden, MA.
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Patient Health Questionnaire Primary Care Study, G. (1999). Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. *JAMA*, 282(18), 1737-1744.
- Stephenson, M. T., Hoyle, R. H., Palmgreen, P., & Slater, M. D. (2003). Brief measures of sensation seeking for screening and large-scale surveys. *Drug and Alcohol Dependence*, 72(3), 279-286.
- Stimson, G. V. (2016). A tale of two epidemics: drugs harm reduction and tobacco harm reduction in the United Kingdom. *Drugs and Alcohol Today*, 12(1), 1-10.
- Stratton, K., Kwan, L. Y., & Eaton, D. L. (2018). *Public health consequences of e-cigarettes: consensus study report*. National Academies of Sciences, Engineering, and Medicine (NASEM). USA: Washington, DC, National Academies Press. NASEM. 2018.
- Sæbø, G. (2017). Cigarettes, snus and status: differences in lifestyle of different tobacco user groups in Norway. *Health Sociology Review*, 26(2), 175-189.
- Sæbø, G., Scheffels, J., & Tokle, R. (2017). "It looks kind of cool when cool people smoke, but..." Norwegian adolescents' decoding of smoking scenes in films. *Nordic Studies on Alcohol and Drugs*, 34(6), 481-496.

- Tashakkori, A., & Teddlie, C. (2010). *Sage handbook of mixed methods in social & behavioral research: sage*.
- Tashakkori, A., Teddlie, C., & Teddlie, C. B. (1998). *Mixed methodology: Combining qualitative and quantitative approaches* (Vol. 46): Sage.
- Thirlway, F. (2016). Everyday tactics in local moral worlds: E-cigarette practices in a working-class area of the UK. *Social Science and Medicine*, *170*, 106-113.
- Thornton, S. (1995). The Social logic of Subcultural Capital. In K. Gelder (Ed.), *The Subcultures Readers* (2 ed.). New York: Routledge.
- Tjora, A. (2012). Kvalitative forskningsmetoder i praksis (2. utg) Gyldendal. In: Oslo.
- Tjora, T., Hetland, J., Aarø, L. E., Wold, B., Wiium, N., & Øverland, S. (2014). The association between smoking and depression from adolescence to adulthood. *Addiction*, *109*(6), 1022-1030.
- Tokle, R. (2014). *Elektroniske sigaretter–bruksmønster, brukergrupper og brukerkultur* (8271714201). Retrieved from <https://www.fhi.no/publ/2014/elektroniske-sigaretter--bruksmonster-brukergrupper-og-brukerkultur/>
- Treur, J. L., Rozema, A. D., Mathijssen, J. J. P., van Oers, H., & Vink, J. M. (2018). E-cigarette and waterpipe use in two adolescent cohorts: cross-sectional and longitudinal associations with conventional cigarette smoking. *European Journal of Epidemiology*, *33*(3), 323-334.
- TSD. (2016, Apr. 11, 2017). An introduction to TSD. Retrieved from <https://www.uio.no/english/services/it/research/sensitive-data/about/introduction.html>
- Unger, M., & Unger, D. W. (2018). E-cigarettes/electronic nicotine delivery systems: a word of caution on health and new product development. *Journal of Thoracic Disease*, *10*(Suppl 22), S2588.
- US DHHS. Department of Health and Human, Services. (2016). *E-cigarette use among youth and young adults: A report of the Surgeon General*. U.S. Department of Health and Human Services. Retrived from: https://www.cdc.gov/tobacco/data_statistics/sgr/e-cigarettes/index.htm
- US DHHS. Department of Health and Human, Services (2018). *Surgeon General’s advisory on e-cigarette use among youth*. U.S. Department of Health and Human Services. Retrived from: <https://e-cigarettes.surgeongeneral.gov/documents/surgeon-generals-advisory-on-e-cigarette-use-among-youth-2018.pdf>.
- Vallone, D., Allen, J. A., Clayton, R. R., & Xiao, H. (2007). How reliable and valid is the Brief Sensation Seeking Scale (BSSS-4) for youth of various racial/ethnic groups? *Addiction*, *102*, 71-78.
- Vartanian, L. R. (2000). Revisiting the imaginary audience and personal fable constructs of adolescent egocentrism: A conceptual review. *ADOLESCENCE-SAN DIEGO-*, *35*, 639-662.
- Vedøy, T. F. (2014). Tracing the cigarette epidemic: An age-period-cohort study of education, gender and smoking using a pseudo-panel approach. *Social Science Research*, *48*, 35-47.
- Vedøy, T. F., & Lund, K. E. (2017). Selvrapporterte forsyningskilder for sigaretter, snus og e-sigaretter. *Tidsskrift for Den norske legeförening*.
- Vugrin, E. D., Rostron, B. L., Verzi, S. J., Brodsky, N. S., Brown, T. J., Choiniere, C. J., . . . Apelberg, B. J. (2015). Modeling the potential effects of new tobacco products and policies: a dynamic population model for multiple product use and harm. *PLoS One*, *10*(3), e0121008.
- Wang, T. W., Neff, L. J., Park-Lee, E., Ren, C., Cullen, K. A., & King, B. A. (2020). E-cigarette use among middle and high school students—United States, 2020. *Morbidity and Mortality Weekly Report*, *69*(37), 1310.
- WHO. (2008). *WHO report on the global tobacco epidemic, 2008: the MPOWER package*. World Health Organization.
- WHO. (2018). *WHO global report on trends in prevalence of tobacco smoking 2000-2025*: World Health Organization.
- Whyte, W. F. (2012). *Street corner society: The social structure of an Italian slum*: University of Chicago Press.
- Williams, J. P. (2006). Authentic identities: Straightedge subculture, music, and the internet. *Journal of contemporary ethnography*, *35*(2), 173-200.

- Willis, P. E. (1977). *Learning to labor: How working class kids get working class jobs.*: Colombia University Press.
- Yates, L., & McLeod, J. (2007). *12 to 18: a qualitative longitudinal study of students, values and difference in Australian Schools*: Australian Curriculum Studies Association Deakin West ACT.
- Yule, J. A., & Tinson, J. S. (2017). Youth and the sociability of “Vaping”. *Journal of Consumer Behaviour*, 16(1), 3-14.
- Zhang, W., & Creswell, J. (2013). The use of “mixing” procedure of mixed methods in health services research. *Medical Care*, 51(8), e51-e57.
- Zuckerman, M. (2010). Sensation seeking. *The Corsini encyclopedia of psychology*, 1-4.
- Zuckerman, M. (2011). *Personality science: Three approaches and their applications to the causes and treatment of depression*: American Psychological Association.

“Cloud chasers” and “substitutes”: e-cigarettes, vaping subcultures and vaper identities

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Abstract The use of e-cigarettes is increasing, a practice denoted as *vaping*. We explore user motives, self-identity as vapers and involvement in vaping subcultures, drawing on sociological theory of stigma, subcultures and symbolic boundaries. Based on analyses of semi-structured interviews with 30 Norwegian vapers, we find that there is a vaping subculture in Norway. We identify two dominant vaper identities. The first is labelled *cloud chasers*. These were dedicated vapers who identified with symbols and values in the subculture. Many were politically engaged in improving vaping regulation regimes and felt a sense of belonging to a vaping community. The second group is labelled *substitutes*. These were former daily smokers who used e-cigarettes for smoking cessation in a more pragmatic and defensive manner, to avoid health risks, to escape the stigma of smoking and to manage nicotine addiction. In this group, self-identity as a vaper was generally lacking. Vaping was often symbolically linked to the stigmatised smoker identity they wanted to escape, and was restricted to private contexts. The perceived symbolic meaning of e-cigarettes varies: for some, they are a symbol of pleasure and community. For others, they connote the stigmatised status of the addicted smoker seeking an alternative to cigarettes.

Keywords: e-cigarettes, identity, smoking, subculture, symbolic boundaries, vaping

Introduction

E-cigarettes are handheld electronic devices that vaporise a flavoured liquid, which the users inhale (WHO 2014). E-cigarettes were initially developed as a less health-damaging practice to cope with nicotine addiction (Hajek *et al.* 2014). However, vaping soon moved beyond a cessation-only practice (Weier 2018), and started to serve social, recreational and sensory expectancies (Pokhrel *et al.* 2015) and to provide new rituals and social practices (Keane *et al.* 2017). The e-cigarettes market has at the same time evolved from early brands highlighting advantages over traditional cigarettes to present products with multiple flavours and product versatility (Zhu *et al.* 2014). E-cigarettes come in a range of models, along with a wide variety of e-liquids and levels of nicotine (Goniewicz *et al.* 2014, Soule *et al.* 2016).

Smoking, vaping and subcultures

As cigarette smoking has moved to the socioeconomic margins of society, its stigma has increased (Graham 2012). In Norway and many other countries, there has been a dramatic decline in smoking over recent decades. Simultaneously, a policy of denormalisation of smoking has been favoured by health authorities, redefining tobacco use as socially unacceptable (Peretti-Watel *et al.* 2014, Saebo 2016). Current smoker identities reflect such redefinitions (Bell *et al.* 2010). In Scheffels' (2009) study of young Norwegian smokers, discourses of smoking as stigmatised and immoral dominated, despite some stories reflecting classical positive meanings of smoking as a symbol of freedom. Evans-Polce *et al.* (2015) identified the process from external stigmatisation to self-stigma with consequences such as guilt, loss of self-esteem and defensiveness. Smoker-related stigmatisation has also been driven by possible health consequences of second-hand smoke and company policies against hiring smokers (Stuber, Galea, & Link, 2008). Patients with diseases such as lung cancer may feel particularly stigmatised as the diagnosis is so strongly linked to smoking (Chapple *et al.* 2004).

E-cigarettes are marketed as less harmful alternatives to smoking (Farsalinos and Polosa 2014). However, Lucherini *et al.* (2017), drawing on a sample of young adult Scottish smokers with disadvantaged backgrounds, observed a more complex picture. First, vaping was perceived as more addictive and less controllable than smoking, due to the lack of ending point and the possibility of vaping indoors. Second, vaping could not replace the social and cultural importance smoking had in these participants' lives. Thirlway's (2016) ethnographic research in a working class area in the UK revealed how different e-cigarette practices had developed: older men constructed e-cigarette use as functional rather than pleasurable, drawing on a narrative of family responsibility. Younger men more often constructed e-cigarettes as a legitimate alternative to smoking cessation that could otherwise conflict with their masculine ethic of working class hedonism (Thirlway 2016). Hoek *et al.* (2017) found some of their participants replicating the smoking rituals, valuing 'cigalikes' for the similarity. Others missed attributes connected with conventional smoking such as combustion and the dense smoke. Others again developed new and unique vaping rituals. Farrimond (2017) also identified differing motivations for use of, and varying political engagement in, vaping regimes among UK vapers. She constructed three main typologies: vaping for pleasure, vaping as medical treatment and ambivalent e-cigarette use, suggesting that the motives of vaping may be linked to different social identities. Some studies have pointed to the importance of online forums, blogs, YouTube videos (Luo *et al.* 2014) and Facebook groups in this process (Dai and Hao 2017, Pepper *et al.* 2017). These findings suggest that vapers as a group are diverse. One may hypothesise that parts of the vaper culture, such as those who develop rituals for vaping (Hoek *et al.* 2017) and those who vape for pleasure (Farrimond 2017), may have characteristics typically associated with visible and often self-confident subcultures.

A traditional perspective of subcultures is presented by Ken Gelder (2005: 4), defining them as groups of people that are "non-normative and/or marginal through their particular interests and practices". Groups may represent themselves in this manner, but may also be classified in this manner by others. Such a perspective, focusing on atypical and sometimes deviant groups, was typical in both the Chicago school (Colosi 2010) and the Birmingham school, where these groups were often regarded as cultural responses to socially marginalised positions (Griffin 2011, Rojek and Turner 2000). However, such perspectives have been criticised, as many may simultaneously participate in several subcultures. Moreover, such research may have overlooked the more ordinary everyday lives of larger groups who are influenced by such subcultures (Bennett and Kahn-Harris 2004). Fine and Kleinman (1979) earlier offered a less rigid understanding, conceptualising subcultures as culturally bounded networks of people who share ideas, material objects, and practices. Following them, subcultures can be interpreted as

clusters of cultural elements and forms of distinctions that do not necessarily dominate people's lives. Thus, they may engage in subcultural practices without identifying as subcultural participants (Thornton 1997).

Vaping is a new activity and its symbolic meanings and associated social practices are constantly being negotiated (Lucherini *et al.* 2018). In this process, subtle distinctions or symbolic boundaries may be important, as they function to establish personal and collective identities (Williams and Copes 2005). According to Lamont and Molnár (2002: 168), symbolic boundaries reflect the struggle over definitions of reality. Drawing symbolic boundaries, we can distinguish “us” from “them”, and separate people into groups that feel similarity, unity and group membership. In this respect, the use of symbolic boundaries also offers people who engage in a certain behaviour the ability to distance themselves from those defined as stigmatised. Similar sociocultural processes have been observed with, for example, occasional smokers: In Scheffels and Tøkle's (2017: 373) study, this group anticipated identities as “someone who smoke, but is not a smoker”. Similarly Hoek *et al.* (2012), revealed how social smokers simultaneously devaluated smoking, framed themselves as ‘better’ than smokers and yet continued to smoke to maintain membership of a social network. Generally, such developments illustrate the importance of shared narratives, symbols and rituals for substance use. Heavy alcohol use has, for example, been found to symbolise the embodiment of hegemonic masculinities (Peralta 2007), while cannabis has been linked to political opposition, androgyny and subcultural identification (Sandberg 2013). The data we present in this study show how individuals sharing the same activity – vaping – may, in a similar vein, create and negotiate such subcultural boundaries.

Methods

The Norwegian context

It is estimated that one per cent of the Norwegian population are daily vapers, while 2.5 per cent vape occasionally (Vedøy 2016). The health authorities have been reluctant to view e-cigarettes as an adequate tool in a harm-reduction-oriented tobacco policy (Lund 2016). At the time of the data collection, Norway permitted the sale of devices but banned the sale of nicotine e-liquid, resulting in 80 per cent of the e-liquid and 60 per cent of the vaporisers being purchased from foreign retailers online or abroad (Vedøy and Lund 2017). However, these products are to be given market access from 2019. Snus and conventional cigarettes are the most frequently used nicotine products, with a prevalence of 12 per cent for daily use of snus and 11 per cent for daily smoking (SSB 2018).

Sample and procedure

Thirty semi-structured interviews with vapers were conducted by the first author in Oslo, Norway between February 2014 and April 2018. The sample consists of 17 males and 13 females, age range 19–52 (mean age 35) (See appendix table A1. for more details on participant characteristics). They represent a heterogeneous group in terms of socioeconomic status, ranging from senior positions in academia and the private sector to unemployed on welfare support. All but one were former smokers. As an inductive, explorative study of the use of e-cigarettes, sampling and analysis followed the structure of grounded theory (Denzin and Lincoln 2008). In the early stages of the purposive recruitment, we observed a variety of users. Some seemed to be proud “public” vapers; others were more reserved and reluctant. To address this hypothesised diversity, we conducted theoretically based sampling from various locations in order to highlight gaps and uncertainties in the existing data and explore different perspectives

(Creswell 2007: 240–1). The first author attended vape meetings and visited vape shops in Oslo to recruit established vapers. Festivals and venues in the nightlife economy were visited in order to investigate use among young adults and the capital's frontrunners. Some were recruited through a post on the Facebook wall for vapers. In order to reach the "less visible" vapers, half the sample was recruited using a chain-referral strategy and extended personal networks. Interviews were informal, even if an interview guide was used to cover key themes. We talked about perceived stigma related to smoking and the use of e-cigarettes, nicotine addiction, trajectories of vaping, perceptions of groups of vapers, experiences of vaping at work and at parties, and online forums and chat groups. Each interview lasted between 1 and 2 hours and was audiotaped.

Participants were paid a NOK 300 fee (approximately GBP 30). The Privacy Protection Committee at the Norwegian Institute of Public Health gave ethical approval for the study, and the study was conducted in accordance with their ethical guidelines. All interviewees gave informed and active consent for participation. To ensure anonymity, names of participants and all identifying details have been changed.

Analysis

The recordings were transcribed by the first author and two qualified research assistants, and imported to the qualitative analysis software HyperRESEARCH. In line with grounded theory, the analysis started immediately, and continued in parallel with data collection (Sbaraini *et al.* 2011). The HyperRESEARCH software was used as an organisational tool in the coding process. First, codes were labelled close to the wording of the vapers themselves (Glaser *et al.* 1968). Both authors then took part in the development of broader and theoretically motivated coding categories (Denzin and Lincoln 2008), such as *vaping versus smoking*, *addiction*, *health*, *stigma*, *community feeling*, and *vaper identity*, drawing on literature on stigma, subcultures and symbolic boundaries. This work led to the construction of our two main categories "cloud chasers" and "substitutes".

Findings

First, we present two contrasting perspectives on the vaping subculture, followed by the identification of the two dominant vaper identities. We then outline the key dimensions of these vaper identities. Finally, we discuss our findings in relation to theory on subculture and stigma.

Two perspectives on vaping subculture

Users of e-cigarettes agreed that one can indeed talk about a vaping subculture in Norway, but they differed in the degree of identification with its symbols and values. Roger (44) and Axel (29) represented opposite positions in this respect. Roger, a former daily smoker, valued the vaping subculture and praised e-cigarettes:

Cigarettes and e-cigarettes are like beer and wine. Beer is just that pint, right. With wine, it's so much more. You can learn; it's about quality. You become a connoisseur. That is how it is with e-cigarettes as well. It's just so much more than smoking.

For Roger, e-cigarettes were a symbol of high-quality enjoyment. E-cigarettes had given him pleasure in a more complex and sophisticated manner than ordinary cigarettes. Axel took a completely different position. He had smoked since he was 13 years old, and had managed to

quit smoking for half a year by switching to e-cigarettes. However, at the time of the interview, he had gone back to “the deadly ones”, sardonically referring to ordinary cigarettes, smoking a pack a day. Axel’s explanation was that he had taken an “aesthetic evaluation”, in the same manner as Roger, but with the opposite conclusion:

You become part of a subculture totally involuntarily, one you don’t identify with at all ...
I was terrified that I would be identified with those people on YouTube if I continued.

Axel described the vaping scene as a “masculine, street-car-aesthetic with bikini-women and bad music”. He said the use of e-cigarettes unintentionally made him part of this vaping subculture, which he disliked. He used rich metaphors:

I skate, you know. Skaters do not like longboard. It represents something wrong. For me, e-cigarettes are the longboard, while fags are the skateboard.

In this manner, Axel constructed symbolic boundaries to separate smoking from vaping (Copes 2016, Lamont and Molnar 2002). His metaphors pointed to “the edge” of skateboards, compared to the more “inauthentic” longboards. Skateboards and smoking were seen as “the real stuff”, echoing how smoking was once perceived as a classical symbol of freedom and individuality (Scheffels 2009). Vaping, like the longboard, was used to appear cool or to fit in. It was, however, done in a manner that has been associated with “pretenders” or “wannabees” (Driver 2011, Fox 1987).

However, the common denominator in these two stories is how both talked about an emerging vaping subculture, albeit from completely different positions. Both referred to vape forums on the internet, championships and vape festivals. Both agreed that traditional cigarettes and e-cigarettes hold different symbolic meanings, describing cigarettes as simple and straightforward and e-cigarettes as more advanced. However, Roger eagerly outlined the possibilities for customisation of e-cigarettes, the range of flavours and the attractive subculture. Axel’s negative perception of the vaping subculture as “wrong” and unappealing conversely made him quit. These differing approaches to the vaper subculture were echoed in the rest of our data material. Two dominant vaper identities became evident; we labelled them “cloud chasers” and “substitutes”.

Cloud chasers

In the Urban Dictionary (nineX, 2015), a cloud chaser is defined as: “a person who, using a personal vaporiser expels large amounts of vapor from their lungs as a spectacle to behold. “Cloud chasers” display their skills at cloud chasing competitions.” Hence, the term is partly defined by the practice of vaping, partly by participation in certain public events. Previous research has linked the term “cloud chasing” to performing demanding “tricks” with vapour (Measham *et al.* 2016). Here, we use the term in a wider, more symbolic sense. As such, the cloud-chaser identity is based on the stories told us by dedicated vapers, those who identified with a vaping subculture. Of 30 interviewees, 12 shared perceptions connecting them to such a subculture. In addition to (i) the visibility of the performance of vaping and the vapour exhaled, we identified and included three other dimensions to the cloud-chaser identity, (ii) vaping as performance and hobby, (iii) a community dimension and (iv) publicly advocating the vape cause.

Vaping as performance and hobby

Kenneth (34) was an articulate representative of the cloud chasers and expressed how many were well aware of the variations in vaper identities:

There are two groups of vapers: those who have a technical interest, you may call us nerds, where vaping has turned into a hobby, and who are likely to be members of a range of forums. The other group, I believe, are the typical smokers who want to stay off cigarettes. They use simpler equipment and are happy with that.

The cloud chasers shared a general notion of e-cigarettes as a health-improving tool to stop smoking. However, importantly, e-cigarettes also offered social and symbolic functions not provided by ordinary cigarettes or snus. Some of the younger adult vapers, for example, described vaping as a tool for gaining attention. Nils (28), a dedicated vaper, described it like this:

One of the aspects of it [vaping] is that it's new and exciting and that you don't really mind having the role as the person with the new, cool gadget.

Particularly in night-life settings, vaping could create positive feed-back. The novelty aspect of vaping may change when vaping diffuses. However, in the Norwegian context, public vaping is still quite rare. Edward (25) described his motives for vaping in a similar manner:

It's new and exciting; we can be early adopters, that's a driving force. It makes it more fun. I vape in a manner that I hope people will notice and ask 'what do you think you are doing?' So I can use the arguments I have prepared: that this is vapour not smoke.

Edward had an oppositional attitude and highlighted the dedicated vapers' visible, proud use of vaporisers. Some decades ago, smoking among youth was similarly linked to sociocultural opposition (Pedersen 1998, Willis 1977). Statements such as those from Edward indicate that today, in some contexts, e-cigarettes may serve as a similar symbol of opposition. At the same time, vaping was clearly distinguished from cigarette smoking. These participants consciously separated the two products; many described vaping as a lifestyle, and used vaporisers with little resemblance to ordinary cigarettes.

Embracing the vaping subculture, cloud chasers described vaping as a hobby, with pleasure, performance and knowledge as important elements. Andre (45) said:

For me it [vaping] has become a hobby. Smoking never was. I want to build my own e-cigarettes – or personal vaporisers to call them by the right term. It's all about advanced equipment to get the best experience possible in terms of taste and clouds.

These vapers often talked about personal customisation of vaporisers, liquids and the “unlimited amounts of flavours” (Barbeau *et al.* 2013, McQueen *et al.* 2011). Critics have argued that sweet flavours such as fruit and candy are designed to encourage vaping in under-age groups (Bonhomme *et al.* 2016). In our study, the range of flavours was in fact part of the appeal. Trying to explain this phenomenon to us as outsiders, they compared vaping to wine connoisseurs and professional baristas. Such unambiguous descriptions of enjoyment are not typical in the substance-use discourse (Duff 2008), due to the dominance of the medical model for accessing health harms, with little room for accounts of pleasure (Moore, 2008).

Many of the cloud-chasers described vaping as a time-consuming hobby. Mikael (19) said: “[Vaping] is something to tamper with for hours. There are so many models and so much to get your head around. I use YouTube tutorials to boost my understanding.” Like Mikael, several used YouTube tutorials to learn relevant skills, in a manner described as typical of the so-called “YouTube generation” (Morris and Anderson, 2015). Several described how they performed “*sick tricks*” with the vapour and ranked this as a key attraction (see also: Measham *et al.* 2016: 229). Other used social media platforms to share images, video footage and

tutorials. Some considered cloud chasing to be a sport and referred to competitions with more or less professional vapers (Mosbergen 2017). The majority of the cloud chasers in our study also invested much time keeping up-to-date on vaping-related topics. Ola (32) said:

Part of the hobby is to be up-to-date on what's happening out there, like: "Have you seen the newest one? Have you read that piece? Have you checked out this?"

Martin (41) spent much time on vape-related activities – managing a blog, keeping abreast of product development, research and regulations. '*Being in the know*', to use the concept coined by Thornton (1997), came out as an important part of this hobby. Most cloud chasers had a high level of knowledge and used numerous vape-related-references. Many used English terminology despite the interviews being conducted in Norwegian, illustrating insider competence. As observed in other substance-using subcultures (Johnson *et al.* 2006), they used complex argot such as "*dripping*", "*steeping*", "*throat hit*" for communication within the vaper subculture. The dynamic use of such argot constitutes a flexible communication system that is also hidden from mainstream culture.

A community and policy dimension

In addition to "being in the know", several of these interviewees were politically engaged with regard to the legislation of e-cigarettes and were often dedicated to the "vaping cause", reflecting how polarised regulatory responses are in this area (Caponnetto *et al.* 2015). They told us how they fought for better regulations and aimed to educate others by spreading vape-related information on forums, blogs and Facebook. Rita (34) called this activity "measures in the fight for the vaping cause". The most active vapers echoed Rita and used the word "*cause*" when discussing their involvement. Their opponents in these stories were often the public health authorities as well as "Big Tobacco".

The enormous potential e-cigarettes have to save lives is heavily limited by the [Norwegian] sales restrictions. I will go so far as to say that it's completely unethical and irresponsible of the Ministry of Health.

Several cloud chasers expressed frustration with existing regulations on e-cigarettes and the way health authorities communicated information related to vaping. Interestingly, as they distinguished between vaping and smoking when describing their motives, their social commitment seemed motivated by their enthusiasm for the product as a health-improving smoking substitute. Emma (27) stated:

The Norwegian government always says no straight away. It doesn't matter that e-cigarettes are a well-functioning alternative to getting cancer. It is only "NO!" It's difficult to take them seriously, but we have to try to make them understand for the sake of other smokers.

Many argued that the government should help smokers to switch from conventional cigarettes to e-cigarettes. In addition, many wanted vaping to be acknowledged in its own right – as a product for pleasure (McQueen *et al.* 2011). The strict legislation may have inspired vapers to unite in a form of shared resistance, reflecting the classical motive of the subculture (Hall and Jefferson 2006).

These vapers often talked about a fellowship of vapers. In Norway, vapers have formed their own organisation, Norwegian Vaping Society, with over 13 000 Facebook members. Several cloud chasers followed this group. Their political engagement reinforced the dedicated vapers' feeling of community. Martin (41) said:

It is extremely important for us who have taken vaping to the next level to find a culture or a hobby that unites everyone. People come from different backgrounds – cultures, gender, race, and they immediately have something in common.

The vaping subculture was described as inclusive, inviting trust, affective friendships and social networks, echoing earlier research on substance-using subcultures (Foster and Spencer 2013). However, the in-real-life-subculture was described as a small “*much above the average dedicated group*” and most claimed that the better part of it was taking place online. Their stories underlined the importance of online communities and national or international vaping forums. The dedicated cloud chasers described themselves as a minority in numbers among users of e-cigarettes, and shared the perception of the majority being former smokers using e-cigarettes to substitute their addiction to conventional smoking.

The substitutes

The majority of our interviewees could be classified in the constructed vaper identity we have labelled the *substitutes*. They were former daily smokers who talked about their vaping in a pragmatic and sometimes defensive manner. The substitutes often echoed a medical model of smoking, solidified by the development of medical treatments to quit smoking (Farrimond *et al.* 2010). They expressed little or no identification with the subcultural dimension of vaping. They were, however, well aware of the existence of more enthusiastic vapers. As Tone (49) said: “*It is a hobby for some, but I believe the majority just use it to substitute smoking*”. Isak (49), in a similar vein, stated, “*I am not interested in building mods. I just want it to work. It’s just a smoking substitute I use to get nicotine*”.

We identified three dimensions of the typical substitute’s identity: (i) e-cigarettes were perceived as a health-improving smoking substitute; (ii) several in this group struggled with stigma related to smoking; and (iii) they used e-cigarettes to cope with nicotine addiction in an often smoking-hostile context.

Improving health

The vapers holding the *substitutes* identity typically had a long history as addicted smokers. For this group, e-cigarettes were a smoking substitute and they often still struggled with nicotine addiction and an identity as smokers. Their stories evolved around ambivalence and problems related to numerous efforts to quit, reflecting the “ambivalent e-cigarette user” identity (Farrimond (2017)). They reported benefits of e-cigarettes, but strongly rejected a vaper identity and took no interest in online forums. Laila’s (40) motivation for vaping was a desire to improve health and at the same time maintain her smoking habit, which was associated with highly ambiguous feelings:

There are those who want to quit smoking and those who don’t want to quit smoking. I am in both categories. I wanted to quit smoking because it is so harmful; you can get cancer, COPD, claudication, you name it. Then there is a part of you that really enjoys it. I like vaping because of that; that it tastes good and is vapoury – like cigarettes.

For Laila, vaping filled the deeply felt void after cigarettes. She was well aware of the adverse health consequences of smoking. However, at the same time, smoking held a positive quality for her, in the same manner as described by Richard Klein (2012) in his exploration of the sublime appeal of cigarettes. In this manner, Laila emphasised both similarities and differences between smoking and vaping. Along the same lines, Ingrid (41) said:

E-cigarettes are for people who don't want to quit smoking, but who should quit. This [referring to her e-cigarettes] is smoking. Chewing gum is not smoking; using a nicotine bandage is not smoking. This is the only way you can give up smoking if you don't want to quit smoking.

Thus, in an apparent paradox, she said she simultaneously quit smoking and continued to smoke. All participants in our study preferred e-cigarettes to traditional nicotine replacement therapy (NRT). Statements such as “I was chewing myself to death on disgusting gums” to “Champix [a cessation medication] made me suicidal” were common in the stories on how vaping was superior to NRT products. The success formula was that e-cigarettes combined the intake of nicotine and the pleasure of smoking. Other cessation methods – abstinence, NRT or medication-assisted withdrawal – operate under the idea that the user has to give up rituals and habits linked to smoking (Weier 2018). Isak (49) had used e-cigarettes regularly for three and half years. He had tried to quit smoking several times, with deep depressions as a result, reflecting research suggesting that unsuccessful smoking cessation may increase mental health problems (Capron *et al.* 2014). He praised the e-cigarettes as they gave him his “*much needed nicotine in a safer manner*”. He continued:

I have decided to never stop smoking again. I am addicted to nicotine and I am going to stay addicted for the rest of my life. I am not putting myself through another 3 months of depression.

Interestingly, Isak also displayed his smoker identity in that he insisted on calling his use of e-cigarettes smoking, explaining that vaping meant “healthier smoking” to him.

Avoiding stigma

Another important motive for using e-cigarettes among the substitutes was the strain of feeling stigmatised as a smoker, reflecting the increasing negative normative climate related to smoking (Saebo 2016). Isak (49) talked about incipient COPD. We asked whether he switched due to such harmful effects. He replied:

Yes, but equally important was the social stigma. My girlfriend was a doctor and in that environment, it is so extremely stigmatising to show your addiction; to go out on the balcony to smoke in a dinner party. I really am an old radical and tried not to give a fuck, but it just became too incriminating.

Carl echoed this motive: “I got concerned by health, but most of all bothered by the stigma”. Surprisingly, these pragmatic users of e-cigarettes often transferred their perception of stigma on to their use of e-cigarettes. Marco (42), a former heavy smoker, talked about how he avoided vaping in public because of the reactions from bystanders:

Many people have given me these weird looks when I'm using one of these (showing his vaporiser). They are probably wondering what it is, right. And it isn't particularly cool. I don't think vaping is cool.

Marco, like several of the interviewees in the substitutes group, preferred to vape in private, despite the good sensory feeling he got when using e-cigarettes. For many in this group, e-cigarettes became a visible symbol of their addiction. Previous research on smokers in cessation services has reported that a narrative of continued nicotine use is seen as a threat to basic goals of getting nicotine-free as well as smoke-free (Rooke *et al.* 2016), and this was also shown in our data. Noelle (31) explained that she never vaped and preferred to smoke when

she was at work, explaining that: “... e-cigarettes show them how addicted I really am to smoking”. Thus, vaping could undergo a symbolic reversal from a health-improving product to one that displays your addiction. For some of the substitutes, it was impossible to escape their internalised feelings of smoking-related stigma. Their hypersensitivity to being perceived as addicted to smoking was transferred to their use of e-cigarettes, resulting in their avoidance of vaping in public.

Thus, e-cigarettes occupy a complex position between pleasure and smoking cessation, subject to perceptions partly originating outside the medical/pharmaceutical sphere, resulting in their controversial status within public health (Stimson *et al.* 2014). This may also be one of the reasons for the complex strategies witnessed among the substitutes. They were insecure about the basic status of e-cigarettes, in much the same manner as observed within the medical profession itself (Cummins *et al.* 2016).

Managing addiction

As opposed to the cloud chasers, most substitutes shared a preference for discreet equipment and vaping in private. A key reason for vaping was that it enabled them to cope with their occasionally deep nicotine addiction. E-cigarettes were also presented as a solution to public and personal smoking restrictions (Keane *et al.* 2017). Carl (34) really enjoyed smoking and described himself as someone “who would love to smoke all day”. By means of e-cigarettes, he was able to function throughout the day, despite his craving for nicotine. Carl appreciated the convenience of vaping, notably that: “e-cigarettes do not burn out, smell or pollute the surroundings”. The fact that e-cigarettes smell less than ordinary cigarettes increases the range of settings in which they may be used (McKeganey *et al.* 2018). At the same time, Carl stressed that, ideally, vaping would be something no one noticed. Camilla (36) agreed:

I want it to be as simple as possible and as similar to smoking as possible. I don't want to think about it or have others thinking about it.

The majority of the substitutes preferred neutral second-generation devices over customised mods, due to their sensitivity to the possible stigma of their nicotine addiction. Some talked about how they wished the smoke were invisible; they disliked the attention from bystanders and used strategies to avoid it, such as using their sleeve to hide their e-cigarette and swallowing the vapour to avoid the appearance of smoking. These strategies allowed them to vape in places where smoking was not an option. In this way, they managed their use of e-cigarettes in a discreet manner without identifying as vapers. These vapers differ from the proud, pleasure-seeking vapers who hold more of a cloud-chaser identity. However, in the same manner as reported by Farrimond (2017), we also observed a more subtle dimension of “pleasure” in this group: they felt healthier and reported having improved their life quality due to their use of e-cigarettes.

Discussion

This study suggests that we are witnessing the contours of a new vaping subculture in Norway. Key characteristics of the vapers centre around two dominant identities, labelled *cloud chasers* and *substitutes*. They differ in their motivations for vaping and hold different positions towards this subculture. Findings are summarised in Table 1 and extend earlier studies by identifying how the symbolic meaning of vaping and vaping subcultures are developed and perceived differently by these two main categories of e-cigarette users.

Table 1 *Defining codes for constructing two vaper identities*

<i>Cloud chasers' characteristics</i>	<i>Substitutes' characteristics</i>
Subcultural participants	Harm reduction
Holding a vaper identity	Vaping primarily as a smoking substitute
Vaping as a hobby	Discrete use of e-cigarettes
Part of a vaping community	Managing nicotine addiction
Engaged in the "vape cause"	Managing stigma
"In the know" on vape-related issues	Perceptions of vaping as stigmatised
Flavours	Negative perceptions of vaping versus smoking
Product customisation	Discreet vaporisers
The pleasure of vaping	The pleasure of holding on to a smoking ritual

As shown in Table 1, those holding the cloud-chaser identity are embedded in the vaping subculture in line with Fine and Kleinman's (1979) understanding of subcultures as culturally bounded networks of people who share ideas, material objects and practices. They engage in vaping-related activities on social media, feel belonging to a vaping community and are engaged in the "vape cause". The performance and the policy aspects of the vaping subculture can often be seen as a reaction towards what they perceive as a repressive health policy and the lack of a harm-reduction oriented approach. Among these vapers, a devaluated smoker identity (Evans-Polce *et al.* 2015, Scheffels 2009) has often been transformed into a proud vaping identity, which reflects the classical motive of the subculture (see e.g. Hall and Jefferson 2006), expressing resistance and opposition. The policy dimension is marked by a bottom-up structure with the aim of impacting regulations. This grass-roots movement distinguishes this group of vapers from other users of e-cigarettes, in a similar manner as has been witnessed in the cannabis policy field (Matthews 2003). Hence, such subcultures may represent organised responses to powerful institutions that do not value their activities (Willis 1977).

The substitutes perceive the vaping subculture more as a barrier to the use of e-cigarettes. They neither identify, nor want to be associated, with this subculture. As shown in Table 1, they have a pragmatic perspective and regard vaping as an efficient harm reduction tool and vape as a smoking substitute. Through discreet use, they manage nicotine addiction as well as stigma. Thus, they emphasise improved health, the pleasures of vaping and successful smoking cessation. At the same time, they are defensive and often ambivalent regarding the symbolic meaning and their use of e-cigarettes, often drawing symbolic boundaries (Copes 2016) by distinguishing and distancing their use of e-cigarettes from "performance" vaping and the aesthetic of the vaper subculture. Our study yields new evidence of the importance of the ritual aspects of vaping (Barbeau *et al.* 2013, Hoek *et al.* 2017). Several substitutes described the paradox that e-cigarettes enabled them "to quit smoking without quitting"; letting them continue with the often-valued practice of "smoking", albeit in a completely different manner and with potential for less damage to health (Barbeau *et al.* 2013). However, among the substitutes, the perceptions of vaping as an activity intrinsically linked to their nicotine addiction (Hoek *et al.* 2017) come with a price in terms of transferring stigma. As such, vaping is linked to the same smoking-related stigma they are trying to escape.

Our study echoes research pointing to the symbolic meaning and identity aspects of other types of substance use as well, such as cigarettes (Scheffels 2009; Scheffels and Tokle 2017; Hoek *et al.* 2012), alcohol (Peralta 2007) and cannabis (Sandberg 2013), in addition to previous studies investigating e-cigarettes from such a perspective (Barbeau *et al.* 2013, Farrimond

2017, Hoek *et al.* 2017, Measham *et al.* 2016, Thirlway 2016). New in our study were the complex perceptions among the users, as some embraced the emerging vaping subculture, while others avoided it. Thus, the subculture may possibly serve as both an efficient tool and a barrier for a successful switch from ordinary cigarettes to e-cigarettes.

Moreover, our findings point to how vaping and vaper identities are still linked to and interwoven with the symbols and practices of cigarette smoking. As smoking has gradually disappeared in high SES groups, remaining smokers are highly stigmatised (Stuber, Galea, & Link, 2008). Previous smokers make up the majority of vapers (Dockrell *et al.* 2013). This is coherent with the purpose of the invented product: e-cigarettes were designed to substitute smoking (Hajek *et al.* 2014). From a diffusion perspective (Rogers 2010), early adopters of new inventions hold top positions in the social hierarchy. However, in the case of vaping, this might not necessarily be the case, since adult vaper groups largely consist of former smokers. Admittedly, e-cigarette users appear to have higher socioeconomic status than ordinary smokers (Brown *et al.* 2014). In our data, the substitutes' stories reflect processes where the images of the stigmatised smoker and the stigma of smoking influenced their perception of vapers and contaminated their use of e-cigarettes.

Academic and media discourses may also have contributed to curbing the adoption of vaping in creating a narrative of uncertainty about the long-term health effects from the use of e-cigarettes (Pepper *et al.* 2017, Reditis *et al.* 2016).

Nonetheless, we also observed resistance to such narratives. Participants in both groups aggressively pointed to how health authorities had tried to make it harder to use vaping as a smoking substitute. Hence, more liberal future regulations may affect the symbolic meaning of vaping, potentially normalise vaping and lower the “switch barrier” for targeted smokers.

Limitations

There are limitations to the study. Firstly, the interviewees are not representative of the wider population of vapers. This also goes for the relative prevalence of the varieties of vaper identities. Even though the interviewees are only scattered in two vaper identities, we do not claim that the relative size of each group is representative of the broader picture. These identities are typologies based on the common and distinguishing characteristics identified in this study. Secondly, data were collected over an extended period of time (2014–2018), and this may raise concerns about datedness, given the high level of innovation and changes characterising the field of e-cigarettes (Farrimond 2017). However, as the goal in this explorative study was to capture different user groups and identities, we argue that the design offers the needed variety to obtain new insights into the symbolic meaning of vaping.

Conclusion

The social meaning of e-cigarettes and vaping varies and involves a vaping subculture, ideas about health through harm reduction, pleasure and community, as well as addiction and stigma. The existing vaper subculture has played a significant role for some vapers; however, the aesthetic and performance part of the subculture in particular may have little appeal for large groups of other vapers. In conclusion, our findings suggest that there is a “split vision” of health and stigma in the perceptions of vaping where the vaper identities are constantly negotiated. We argue that our findings add to the understanding of varying motives for use and new insights into the possible diffusion process of e-cigarettes.

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Acknowledgements

We thank Karl Erik Lund and Janne Scheffels at the Norwegian institute of public health (NIPH) for helpful comments, and the two anonymous peer reviewers whose suggestions to earlier drafts considerably helped improve the article. This project has been made possible by the Norwegian ExtraFoundation for Health and Rehabilitation.

References

- Barbeau, A., Burda, J. and Siegel, M. (2013) Perceived efficacy of e-cigarettes versus nicotine replacement therapy among successful e-cigarette users: a qualitative approach, *Addiction Science & Clinical Practice*, 8, 5.
- Bell, K., McCullough, L., Salmon, A. and Bell, J. (2010) 'Every space is claimed': smokers' experiences of tobacco denormalisation, *Sociology of Health & Illness*, 32, 6, 914–29.
- Bennett, A. and Kahn-Harris, K. (2004) *After Subculture*. Basingstoke: Macmillan.
- Bonhomme, M. G., Holder-Hayes, E., Ambrose, B. K., Tworek, C., et al. (2016) Flavoured non-cigarette tobacco product use among US adults: 2013–2014. Tobacco control, *Tobaccocontrol*, 2016.
- Brown, J., West, R., Beard, E., Michie, S., et al., (2014) Prevalence and characteristics of e-cigarette users in Great Britain: findings from a general population survey of smokers, *Addictive Behaviors*, 39, 6, 1120–5.
- Caponnetto, P., Saitta, D., Sweanor, D. and Polosa, R. (2015) What to consider when regulating electronic cigarettes: pros, cons and unintended consequences, *International Journal of Drug Policy*, 26, 6, 554–9.
- Capron, D.W., Allan, N.P., Norr, A.M., Zvolensky, M.J., et al., (2014) The effect of successful and unsuccessful smoking cessation on short-term anxiety, depression, and suicidality, *Addictive Behaviors*, 39, 4, 782–8.
- Chapple, A., Ziebland, S. and McPherson, A. (2004) Stigma, shame, and blame experienced by patients with lung cancer: qualitative study, *British Medical Journal*, 328, 7454, 1470–3.
- Colosi, R. (2010) A return to the Chicago school? From the 'subculture' of taxi dancers to the contemporary lap dancer, *Journal of Youth Studies*, 13, 1, 1–16.
- Copes, H. (2016) A narrative approach to studying symbolic boundaries among drug users: a qualitative meta-synthesis, *Crime Media Culture*, 12, 2, 193–213.
- Creswell, J.W. (2007) *Qualitative Inquiry and Research Design. Choosing Among Five Approaches*, 2nd edn. USA: Sage Publications.
- Cummins, S., Leischow, S., Bailey, L., Bush, T., et al. (2016) Knowledge and beliefs about electronic cigarettes among quitline cessation staff, *Addictive Behaviors*, 60, 78–83.
- Dai, H. and Hao, J. (2017) Mining social media data for opinion polarities about electronic cigarettes, *Tobacco Control*, 26, 2, 175–80.
- Denzin, N.K. and Lincoln, Y.S. (2008) *Strategies of Qualitative Inquiry*, Vol. 2. Thousand Oaks: Sage Publications.
- Dockrell, M., Morrison, R., Bauld, L. and McNeill, A. (2013) E-cigarettes: prevalence and attitudes in Great Britain, *Nicotine & Tobacco Research*, 15, 10, 1737–44.
- Driver, C. (2011) Embodying hardcore: rethinking 'subcultural' authenticities, *Journal of Youth Studies*, 14, 8, 975–90.
- Duff, C. (2008) The pleasure in context, *International journal of drug policy*, 19, 5, 384–92.

- Evans-Polce, R.J., Castaldelli-Maia, J.M., Schomerus, G. and Evans-Lacko, S.E. (2015) The downside of tobacco control? Smoking and self-stigma: a systematic review, *Social Science & Medicine*, 145, 26–34.
- Evans-Polce, R.J., Patrick, M.E., Lanza, S.T., Miech, R.A., *et al.* (2017) Reasons for Vaping among U.S. 12th Graders. *Journal of Adolescent Health*, 62, 4, 457–62.
- Farrimond, H. (2017) A typology of vaping: identifying differing beliefs, motivations for use, identity and political interest amongst e-cigarette users, *International Journal of Drug Policy*, 48, 81–90.
- Farrimond, H., Joffe, H. and Stenner, P. (2010) A Q-methodological study of smoking identities, *Psychology and Health*, 25, 8, 979–98.
- Farsalinos, K.E. and Polosa, R. (2014) Safety evaluation and risk assessment of electronic cigarettes as tobacco cigarette substitutes: a systematic review, *The Adv Drug Saf*, 5, 2, 67–86.
- Fine, G.A. and Kleinman, S. (1979) Rethinking subculture: an interactionist analysis, *American journal of sociology*, 85, 1, 1–20.
- Foster, K. and Spencer, D. (2013) ‘It’s just a social thing’: drug use, friendship and borderwork among marginalized young people, *International Journal of Drug Policy*, 24, 3, 223–30.
- Fox, K.J. (1987) Real punks and pretenders - The social organization of a counterculture, *Journal of Contemporary Ethnography*, 16, 3, 344–70.
- Gelder, K. (2005) *The Subcultures Reader*. Hove: Psychology Press.
- Glaser, B.G., Strauss, A.L. and Strutzel, E. (1968) The discovery of grounded theory; strategies for qualitative research, *Nursing Research*, 17, 4, 364.
- Goniewicz, M.L., Hajek, P. and McRobbie, H. (2014) Nicotine content of electronic cigarettes, its release in vapour and its consistency across batches: regulatory implications, *Addiction*, 109, 3, 500–7.
- Graham, H. (2012) Smoking, Stigma and Social Class, *Journal of Social Policy*, 41, 83–99.
- Griffin, C.E. (2011) The trouble with class: researching youth, class and culture beyond the ‘Birmingham School’, *Journal of Youth Studies*, 14, 3, 245–59.
- Hajek, P., Etter, J.F., Benowitz, N., Eissenberg, T., *et al.* (2014) Electronic cigarettes: review of use, content, safety, effects on smokers and potential for harm and benefit, *Addiction*, 109, 11, 1801–10.
- Hall, S. and Jefferson, T. (2006) *Resistance Through Rituals*. London: Routledge.
- Hoek, J., Maubach, N., Stevenson, R., Gendall, P., *et al.* (2012) Social smokers’ management of conflicted identities. *Tobacco control*, 22, 4, 261–5.
- Hoek, J., Thrul, J. and Ling, P. (2017) Qualitative analysis of young adult ENDS users’ expectations and experiences, *British Medical Journal Open*, 7, 3, e014990.
- Johnson, B.D., Bardhi, F., Sifaneck, S.J. and Dunlap, E. (2006) Marijuana argot as subculture threads - Social constructions by users in New York City, *British Journal of Criminology*, 46, 1, 46–77.
- Keane, H., Weier, M., Fraser, D. and Gartner, C. (2017) ‘Anytime, anywhere’: vaping as social practice, *Critical Public Health*, 27, 4, 465–76.
- Klein, R. (2012) *Cigarettes are Sublime*. Durham: Duke University Press.
- Lamont, M. and Molnár, V. (2002) The study of boundaries in the social sciences, *Annual review of sociology*, 28, 1, 167–95.
- Lucherini, M., Rooke, C. and Amos, A. (2017) ‘They’re thinking, well it’s not as bad, I probably won’t get addicted to that. But it’s still got the nicotine in it, so ...’: maturity, control and socialising: negotiating identities in relation to smoking and vaping. A qualitative study of young adults in Scotland. *Nicotine & Tobacco Research*.
- Lucherini, M., Rooke, C. and Amos, A. (2018) E-cigarettes, vaping and performativity in the context of tobacco denormalisation, *Sociology of Health and Illness*, 40, 6, 1037–52.
- Lund, K.E. (2016) Article Commentary: The role of e-cigarettes in the tobacco endgame, *Nordic Studies on Alcohol and Drugs*, 33, 3, 241–2.
- Luo, C., Zheng, X., Zeng, D.D. and Leischow, S. (2014) Portrayal of electronic cigarettes on YouTube, *BMC Public Health*, 14, 1028.
- Matthews, P. (2003) *Cannabis Culture*. London: Bloomsbury Publishing.
- McKeganey, N., Barnard, M. and Russell, C. (2018) Vapers and vaping: E-cigarettes users views of vaping and smoking. *Drugs: Education, Prevention and Policy*, 25, 1, 13–20.
- McQueen, A., Tower, S. and Sumner, W. (2011) Interviews With ‘Vapers’: implications for Future Research With Electronic Cigarettes, *Nicotine & Tobacco Research*, 13, 9, 860–7.

- Measham, F., O'Brien, K. and Turnbull, G. (2016) "Skittles & Red Bull is my favourite flavour": e-cigarettes, smoking, vaping and the changing landscape of nicotine consumption amongst British teenagers - implications for the normalisation debate, *Drugs-Education Prevention and Policy*, 23, 3, 224–37.
- Moore, D. (2008) Erasing pleasure from public discourse on illicit drugs: On the creation and reproduction of an absence, *International Journal of Drug Policy*, 19, 5, 353–8.
- Morris, M. and Anderson, E. (2015) 'Charlie is so cool like': Authenticity, popularity and inclusive masculinity on YouTube, *Sociology*, 49, 6, 1200–17.
- Mosbergen, D. (2017) This Man Is An Athlete In The Sport Of 'Cloud Chasing'. *Huffington Post*.
- Pedersen, W. (1998) *Bittersøtt: ungdom, sosialisering, rusmidler*. Oslo, Norway: Universitetsforlaget.
- Pepper, J.K., Lee, Y.O., Watson, K.A., Kim, A.E., et al. (2017) Risk Factors for Youth E-Cigarette "Vape Trick" Behavior, *Journal of Adolescent Health*, 61, 5, 599–605.
- Peralta, R.L. (2007) College alcohol use and the embodiment of hegemonic masculinity among European American men, *Sex Roles*, 56, 11–12, 741–56.
- Peretti-Watel, P., Legleye, S., Guignard, R. and Beck, F. (2014) Cigarette smoking as a stigma: evidence from France, *International Journal on Drug Policy*, 25, 2, 282–90.
- Pokhrel, P., Herzog, T.A., Muranaka, N. and Fagan, P. (2015) Young adult e-cigarette users' reasons for liking and not liking e-cigarettes: a qualitative study, *Psychology & Health*, 30, 12, 1450–69.
- Roditis, M., Delucchi, K., Cash, D. and Halpern-Felsher, B. (2016) Adolescents' Perceptions of Health Risks, Social Risks, and Benefits Differ Across Tobacco Products, *Journal of Adolescent Health*, 58, 5, 558–66.
- Rogers, E.M. (2010) *Diffusion of Innovations*. New York City, NY: Simon and Schuster.
- Rojek, C. and Turner, B. (2000) Decorative sociology: towards a critique of the cultural turn, *Sociological Review*, 48, 4, 629–48.
- Rooke, C., Cunningham-Burley, S. and Amos, A. (2016) Smokers' and ex-smokers' understanding of electronic cigarettes: a qualitative study, *Tobacco Control*, 25, E1, E60–6.
- Saebø, G. (2016) Tobacco denormalisation and representations of different tobacco users in Norway: a cross-sectional study, *Sociology of Health & Illness*, 38, 3, 360–79.
- Sandberg, S. (2013) Cannabis culture: a stable subculture in a changing world, *Criminology & Criminal Justice*, 13, 1, 63–79.
- Sbaraini, A., Carter, S.M., Evans, R.W. and Blinkhorn, A. (2011) How to do a grounded theory study: a worked example of a study of dental practices, *BMC Medical Research Methodology*, 11, 1, 128.
- Scheffels, J. (2009) Stigma, or sort of cool Young adult's accounts of smoking and identity, *European Journal of Cultural Studies*, 12, 4, 469–86.
- Scheffels, J. and Tokle, R. (2017) 'Addicted to being cool': occasional smoking in a western context of tobacco denormalization, *Addiction Research & Theory*, 25, 5, 368–74.
- Soule, E.K., Lopez, A.A., Guy, M.C. and Cobb, C.O. (2016) Reasons for using flavored liquids among electronic cigarette users: a concept mapping study, *Drug and Alcohol Dependence*, 166, 168–76.
- SSB. (2018) URL: <https://www.ssb.no/royk>
- Stimson, G.V., Thom, B. and Costall, P. (2014) Disruptive innovations: the rise of the electronic cigarette, *International Journal of Drug Policy*, 25, 4, 653–5.
- Stuber, J., Galea, S. and Link, B.G. (2008) Smoking and the emergence of a stigmatized social status, *Social Science and Medicine*, 67, 3, 420–30.
- Thirlway, F. (2016) Everyday tactics in local moral worlds: e-cigarette practices in a working-class area of the UK, *Social Science and Medicine*, 170, 106–13.
- Thornton, S. (1997) *The social logic of subcultural capital [1995]*.
- Vedøy, T.F. (2016) *Rusmidler i Norge*. Available from https://www.fhi.no/globalassets/dokumenterfiler/rapporter/rusmidler_i_norge_2016.pdf
- Vedøy, T.F. and Lund, K.E. (2017) Self-reported sources for distribution of cigarettes, snus and e-cigarettes, *Tidsskrift for den Norske lægeforening*, 137, 16, 1185–90.
- Weier, M. (2018) Moving beyond vaping as a cessation-only practice, *Addiction*, 113, 3, 406–7.
- WHO. (2014) *Electronic nicotine delivery systems*. Available from http://apps.who.int/gb/fctc/PDF/cop6/FCTC_COP6_10-en.pdf

- Williams, J.P. and Copes, H. (2005) "How edge are you?" Constructing authentic identities and subcultural boundaries in a straightedge internet forum, *Symbolic Interaction*, 28, 1, 67–89.
- Willis, P.E. (1977) *Learning to Labor: How Working Class Kids Get Working Class Jobs*. New York City, NY: Columbia University Press.
- Zhu, S.H., Sun, J.Y., Bonnevie, E., Cummins, S.E., *et al.* (2014) Four hundred and sixty brands of e-cigarettes and counting: implications for product regulation, *Tobacco Control*, 23, 3–9.

Appendix

Table A1 *Participant characteristics*

<i>Pseudonym</i>	<i>Age</i>	<i>Gender</i>	<i>Smoker status*</i>	<i>Vaping status**</i>	<i>Years vaped</i>	<i>Device</i>	<i>Vaper identity</i>
Emma	27	F	Former DS	DV	3	Mod&VP	Cloud chaser
Anne	33	F	Former OS	OV	1.5	Vape pen	Substituter
Rita	34	F	Former DS	DV	3	Mod	Cloud chaser
Nils	28	M	Former OS	DV	2	Mod	Cloud chaser
Kenneth	34	M	Former DS	DV	6	Mod	Cloud chaser
Monica	22	F	Former DS	DV	1	Vape pen	Substituter
Edvard	25	M	Former DS	DV	1	Mod	Cloud chaser
Marco	43	M	Former DS	DV	2	Mod	Substituter
Oscar	29	M	OS	DV	1	Mod	Cloud chaser
Andre	45	M	Former DS	DV	2.5	Mod	Cloud chaser
Rolf	25	M	Former DS	DV	2.5	Mod	Cloud chaser
Marte	34	F	Former OS	OV	2	Vape pen	Substituter
Laila	40	F	Former DS	DV	1	Vape pen	Substituter
Kåre	51	M	Former DS	DV	2	Mod	Cloud chaser
Ola	32	M	Former DS	DV	1.5	Vape pen	Substituter
Tone	49	F	Former DS	DV	2	Vape pen	Substituter
Axel	29	M	DS	Former DV	0.5	Mod	Substituter
Roger	44	M	Former DS	DV	2	Mod	Cloud chaser
Jack	40	M	Former DS	DV	3	Mod	Substituter
Carl	33	M	OS	DV	2	Mod	Substituter
Philip	30	M	OS	OV	1.5	Vape pen	Substituter
Mikael	19	M	NS	OV	1	Mod	Cloud chaser
Isak	48	M	Former DS	DV	3.5	Mod	Substituter
Karen	52	F	Intermittent	DV	2.5	Mod	Substituter
Ingrid	41	F	Former DS	DV	2	Mod	Substituter
Noelle	27	F	Intermittent	DV	1	Vape pen	Substituter
Camilla	23	F	OS	OV	0.5	Vape pen	Substituter
Fanny	31	M	Intermittent	OV	1	Mod	Substituter
Martin	40	M	Former DS	DV	3	Mod	Cloud chaser
Lotta	43	F	Former DS	DV	3	Vape pen	Substituter

*DS: daily smoker; OS: occasional smoker; NS, never smoker.

**DV: daily vaper; OV: occasional vaper.



Bottom-up meets top-down: exploring vapers' accounts of risk in a context of e-cigarette controversies

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(Received 6 May 2019; accepted 27 March 2020)

Framed both as a solution to and as an additional part of the tobacco problem, e-cigarettes have been the subject of risk controversies since they were launched in 2006, followed by massive divergence in media, public health approaches and regulations across the world. This study explores vapers' risk perceptions and accounts of the public risk communication and regulation of e-cigarettes in a Norwegian context where nicotine-containing e-liquids are prohibited from being sold by domestic retailers. Based on analyses of semi-structured qualitative interviews ($n = 30$, 17 males) with adult vapers, I find that the participants emphasised three important dimensions related to risk. First, they perceived vaping as harm reduction by substituting for smoking. Second, they devalued much of the risk communication about e-cigarettes from Norwegian health authorities and media. Interlinked with their harm-reduction approach, they perceived the present regulation of nicotine e-liquid and vaporisers as increasing risk by decreasing their availability to smokers. Third, in general they preferred the lay expertise available online to the health authorities' information on e-cigarettes. The analysis displays a lack of trust among the participants in what can be labelled as top-down information. Based on these dimensions, I conclude that the dissonance between vapers risk perceptions and the regulation and mixed messages in risk communication of e-cigarettes has contributed to their preference for bottom-up expertise. From the vapers' point of view, e-cigarettes represent harm reduction, and the vaper community symbolises a bottom-up health movement where peer assistance compensates for a perceived lack of assistance from health authorities.

Keywords: risk communication; lay expertise; e-cigarettes; controversies; regulations; trust; risk perceptions

Introduction

Since the e-cigarette was launched as a smoking substitute in 2006 (Hajek et al., 2014), it has been the object of increasing interest and controversy (Bell & Keane, 2012). The use of e-cigarettes have been presented as a solution to the tobacco smoking problem, one of the main causes of ill health and premature death worldwide (Gowing et al., 2015), as well as evoked fear of additional harm, renormalisation of smoking (Fairchild et al., 2014) and new nicotine-addicted generations (Gilreath et al., 2016). The controversies have been followed by massive divergence in media, public health approaches and regulations across the world (Adekola et al., 2019; Annechino & Antin, 2016). In this paper, set in a Norwegian context where the sale of nicotine liquid is prohibited, I explore how vapers perceive and account for the public risk communication and regulations of e-cigarettes.

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In what follows, I outline an overview of the present context and literature on the epistemic climate of vaping and introduce the concepts of risk and stigma relevant to the analysis. I then present the qualitative design of the study, which consist of data from semi-structured individual interviews with adult users of e-cigarettes. The analysis of these data revealed a lack of trust among the participants in what can be labelled as top-down risk information. I identified three main dimensions associated with e-cigarettes and risk. First, they framed e-cigarettes as a smoking substitute and hence vaping as harm reduction. Second, they dismissed risk communication from health authorities when it conflicted with their harm reduction approach. Third, the adult vapers commonly favoured lay expertise over health authorities' information on e-cigarettes

Context

The invention of the e-cigarette can be understood as a disruptive technology (Fagerstrom et al., 2015) and a turning point in the history of tobacco, due to its contribution to a dramatic change in the nicotine market, with a shift away from combustion. Moreover, e-cigarettes, defined as handheld electronic devices that vaporise a flavoured liquid, often containing nicotine, for users to inhale (WHO, 2014), were relatively early on acknowledged, from a harm-reduction perspective, as having the potential to yield positive results on smoking cessation at a public health level (Fairchild et al., 2014). At the same time, applying a precautionary principle, e-cigarettes are a relatively recent addition to the nicotine market and there is a possibility that future research might reveal negative health effects from long-term use (Drope & Schluger, 2018). Furthermore, evidence to date indicates that e-cigarettes are not without risk, albeit likely to involve substantially less health risk than combustible cigarettes despite the long-term health effects of vaping remaining unknown (See National Academies of Sciences, E. & Medicine, 2018, for a more comprehensive review of public health consequences of e-cigarettes).

The epistemic climate of vaping

The communication of risk following use of new products encompasses both political implications and moral questions (Lupton, 1993). At present, there are complex international and multi-sourced risk communications on e-cigarettes. Health authorities across the world, including public health officials, regulators, and scientific scholars and professional communities, have been divided on matters relating to e-cigarettes with a more critical 'anti-vaping' community suggesting implementation of a ban on e-cigarettes, and a more pragmatic 'pro-vaping' community advocating for their use as an important tool in a harm-reduction strategy (Fairchild et al., 2014; Green et al., 2018; Warner & Schroeder, 2017). Focusing on the risk proportionality in their risk communication, harm-reduction-focused researchers are upholding evidence that e-cigarettes have the potential to save lives as a smoking substitute (Rooke et al., 2012).

The 'pro-vaping' community also consists of users of e-cigarettes offering their bottom-up expertise (Abrams et al., 2018; Green et al., 2018). The bottom-up approach emphasises local decision-making, community participation and grassroots mobilisation (Panda, 2007). On the opposite side are the anti-vaping community, consisting largely of representatives of the health authorities supporting tobacco-denormalisation policies which imply a rejection of the idea of tobacco harm reduction (Annechino & Antin, 2016) and strongly favour an

abstinence-only vision (Warner & Schroeder, 2017). Such rejection applies even if the harm potential of the product might be drastically reduced (Glantz & Bareham, 2018), as is the case with e-cigarettes and low nitrosamine ‘Swedish’ snus – a smokeless type of tobacco that is significantly less harmful than cigarettes (Nutt et al., 2014; Royal College of Physicians of London. Tobacco Advisory, G, 2007).

Some of the reluctance by some health authorities to welcome e-cigarettes as an adequate tool against tobacco smoking can be connected to ideology and the way that vaping mimics smoking (Bell & Keane, 2012), a practice that has been increasingly stigmatised over recent decades (Peretti-Watel, Legleye et al., 2014). Although e-cigarettes do not contain tobacco or involve combustion, they enhance the most dominant semiotic referent of the cigarette: the maintenance of ‘smoke’ (Bell & Keane, 2012). From a tobacco-control point of view, this can serve as a signifier of smoking and invoke the memory of public smoking and ‘renormalisation’. This can be challenging from some perspectives because of the role of tobacco denormalisation in current policies (Bell & Keane, 2012). Fear of a ‘gateway effect’ is an additional argument propounded by some health authorities, with the idea that use of e-cigarettes can cause subsequent uptake of cigarette smoking (Drope & Schluger, 2018). Moreover, additional controversies concerning e-cigarettes centre on how to define them, how to measure their effectiveness in smoking cessation and how to interpret the relevance of biomedical markers of short-term exposure for potential health effects. The involvement of ‘big tobacco’, such as British American Tobacco (BAT) and Altria (formerly Phillip Morris) (Abate, 2017) in e-cigarette production has further increased scepticism (Glantz & Bareham, 2018). At present, both pharmaceutical companies and ‘big tobacco’ have developed their own e-cigarette brands (Bareham et al., 2016).

Based on these highly contested debates over risk, e-cigarettes have presented a regulatory challenge for policymakers and governments, resulting in various outcomes; the products are banned in several countries; others permit the sale of devices, but not the sale of nicotine-containing e-liquid. Most countries have a regulated market, but often under tobacco control policies rather specific e-cigarette regulation (Drope & Schluger, 2018; Kennedy et al., 2017). In most European countries, e-cigarettes are regulated as a tobacco product under the EU’s Tobacco Products Directive (TPD). In Norway, however, the sale of nicotine-containing e-liquids is banned, although evaporator devices are legally available from a steadily increasing number of vapour shops (Vedoy & Lund, 2017). Under the EEA agreement, Norway is committed to adopting EU regulations (TPD) and consequently the ban on nicotine-containing e-liquids is expected to be lifted in 2020. The most commonly used nicotine products in Norway are Swedish snus (a low-nitrosamine smokeless tobacco product) (daily use across 12 per cent of the population) and conventional cigarettes (daily use across 12 per cent of the population) (SSB, Statistics Norway, 2018). In a recent national representative survey, 1.2 per cent of the respondents reported using e-cigarettes daily, while an additional 2.4 per cent reported occasional use (Lund et al., 2018). Despite a level of scientific disagreement as noted above, the Norwegian health authorities have traditionally been reluctant to adopt tobacco harm reduction as a supplementary strategy in tobacco control, and neither e-cigarettes nor Swedish snus are considered part of the official solution to the tobacco problem (Lund, 2016). In spite of the ban, prior research has identified a vaping sub-culture in Norway, typically expressed through social media (Tokle & Pedersen, 2019).

Risk communication and stigma

In line with several approaches to risk which consider a combination of probabilities and values, Sandman (1993) considers risk as a function of hazard and outrage. Hazard here involves the multiplication of two factors: how bad the event is when it happens and how likely it is to happen. Outrage points to the worries and risk perceptions of the non-expert public representing the bottom-up-approach. According to Sandman (1993, p. 20): ‘The public often misperceives the hazard. The experts often misperceive the outrage. But the overarching problem is that the public cares too little about the hazard, and the experts care too little about the outrage.’

My analysis in this article follows this approach of Sandman (1993) and is moreover guided by an understanding of risk as a constructed and sociocultural concept, rather than a neutral and easily measurable one (Lupton, 1993, 1999; Sandman, 1993). The concept of risk is for example, interlinked with the sociological concept of stigma. A social stigma can be defined as a distinguishing behaviour, or status, which is socially discrediting in a particular way (Goffman, 2009). Individuals who choose to ignore health risks can be perceived as placing themselves in danger of illness and disability, which puts them in a stigmatised role, as their activities can impose a cost on the community (Lupton, 1993, p. 429). Smoking is a commonly used example of a lifestyle risk, with smoking in the presence of bystanders adding the dimension of harm to others. The communication of the risk of vaping seems to be interlinked with that of smoking, with various arguments put forward, such as that vaping means swapping one addiction for another or that vaping leads to the renormalisation of smoking (see above).

Public health authorities have traditionally held a position as providers of objective guidance on matters affecting public health. However, against the backdrop of mixed risk communication of e-cigarettes, a lack of trust in researchers and health authorities has been observed in studies of members of e-cigarette forums (Annechino & Antin, 2016). Trust is often addressed in terms of its function in society (Meyer & Ward, 2009), as it reduces the complexity of how we think about phenomena and simplifies our resolutions to act (Pearson et al., 2005). Trust can be defined as an optimistic acceptance based on positive expectations of the intentions of the trusted individual and institution in a vulnerable situation (Meyer & Ward, 2009). It is unreasonable to expect the public to seek sufficient information to assess potential risk in its entirety. Thus, laypeople, here users of e-cigarettes, ‘must’ trust scientists, government officials, and the news media to inform them (Lupton, 1993, pp. 430–431). Such risk communication can be considered as a ‘top down’ validation exercise in which experts seek to educate a seemingly misguided public into the ‘reality’ of possibility and danger (O’Riordan et al., 1989). These mediators can potentially distort the ‘facts’ to further their case, making it difficult for laypeople to conceptualise risk in the face of conflicting perspectives (Lupton, 1993, p. 431).

The expert role has changed dramatically over the last decade. The current trend involves consumers collecting facts and information online from multiple sources in an increasingly self-sufficient manner, which marks a decentralising shift away from top-down authority (Lankes, 2008). While vaping companies promote e-cigarettes on YouTube as an alternative to cigarettes (Willis et al., 2017) and use social media influencers to create trust among a loyal audience of like-minded peers (Daniel et al., 2018), media are found to present varied and contradictory messages in their risk communication about e-cigarettes (Morphett et al., 2019). Simultaneously, Annechino and Antin (2016, pp. 110–111) found that mass media campaigns aiming at discrediting the e-cigarette industry were dismissed by pro-vapers as false information presented by

biased health authorities. In line with the bottom-up approach, online communities offer lay expertise in the form of alternative notions of health and risk based on assistance from peers. The community dimension within such online communities also forms a basis for personal and collective support (Bilgrei, 2019; Daniel et al., 2018).

Previous studies have found perceived risk to motivate health behaviour (Pepper et al., 2015). Amrock et al., (2014) reported that many adolescents felt unable to assess the comparative harms and benefits of using e-cigarettes relative to cigarettes, however, those who perceived e-cigarettes as less harmful than conventional cigarettes were more likely to practice vaping. Such positive user predispositions can be explained by theories of selective exposure (Hart et al., 2009) and perception or optimism bias (Masiero et al., 2015).

To date, little research has been conducted on the association between vapers perceptions of risk, risk communication and the regulation of e-cigarette use. By utilising a bottom-up perspective, in a sample of adult vapers in Norway, this study explores users' perceptions of risk and risk communication of e-cigarettes in a restricted legislative context.

Methodological account

Sample, procedure and analysis

In this study I analyse qualitative data collected from 30 interviews with users of e-cigarettes, of whom 17 were male, set in Oslo, Norway between February 2014 and April 2018. The age range was 19–52 years (mean age 35). The interviewees' socio-economic status varied. Employment status ranged from managers to students and to those who are unemployed and on welfare support. All but one of the participants were former smokers (See Table 1 for more details on participant characteristics).

Following an inductive logic of investigation, my sampling approach and analysis were inspired by grounded theory (Denzin & Lincoln, 2008). I began to analyse the data in parallel with data collection. To explore themes that occurred in the material and ensure a spectrum of perspectives, I purposively sampled vapers from various locations (Charmaz & Belgrave, 2012). The sampling process started at a vape meeting with the inclusion of two experienced vapers. Three users were recruited from two different vape shops; six participants were recruited through a post on the Facebook page of the largest Norwegian vaping group. The explorative recruitment design continued by visiting music festivals and venues in the night-time economy with the aim of investigating the use of e-cigarettes among young adults. Finally, in order to reduce sample bias and locate participants from categories that were missing in the sample, such as the less visible substitute vapers, I recruited half the sample by using a chain-referral strategy and extended personal networks.

The interviews lasted between 1 and 2 hours and were semi structured by an interview guide consisting of 10 main themes. Those most relevant for the analysis were 'risk perceptions' and 'regulation and opposition'. Interviews were audio recorded and transcribed verbatim to provide access to the vapers' own descriptions during the process of analysis. The data were subject to comparative analysis that developed over multiple stages (Charmaz & Belgrave, 2012). HyperRESEARCH software was used to sort and break down the material. Codes were generated based on the themes in the interview guide, previous research and phrasing of the participants (Glaser et al., 1968). The most frequently used codes in the study were: 'e-cigarettes and perceived health risks', 'personal health experiences following use', 'e-cigarettes relative to smoking/snus/NRT-products', 'e-cigarettes as smoking cessation', 'regulation', 'risk communication' and 'gateway'. After systematic, yet open, analysis and comparing of the concrete content in these codes (Charmaz & Belgrave,

Table 1. Sample characteristics (N = 30).

Characteristics	N
Gender	
Female	13
Male	17
Years of age	
19-29	10
30-39	8
40-49	10
50-59	2
Smoker status	
Former daily smoker	18
Daily smoker	1
Former occasional smoker	3
Occasional smoker	4
Intermittent smoker	3
Non smoker	1
Vaping status	
Daily vaper	23
Occasional vaper	6
Former daily vaper	1
Device	
Mod	19
Vape pen	10
Mod & vape pen	1
Vaper identity	
Substituter	18
Cloud chaser	12

2012), using simple tables, I identified a consistent pattern whereby vapers perceived their risk perceptions as conflicting with what I label ‘top down risk communication’. The term ‘Top down risk communication’, is in this study used as a collective term to capture the vaping participants’ (often conflated) perceptions of the risk communication and regulation of e-cigarettes by perceived health authorities, including some researchers, and the media. I organised the risk-pattern in the interviewees’ accounts by constructing three main dimensions presented in the findings: ‘Vaping as harm reduction’. ‘Dismissal of health authority messages’ and a ‘bottom-up movement celebrating lay expertise’. Subsequently, relevant theoretical frameworks were integrated (Denzin & Lincoln, 2008), such as the concept of risk (Lupton, 1999) and stigma (Goffman, 2009).

The study received ethical approval from the Privacy Protection Committee at NIPH and was carried out in accordance with their ethical guidelines. Interviewees were thoroughly informed of the study and gave active consent for participation. Identifying features, such as name and place of residence, were changed or omitted from transcripts and scientific output. Participants were compensated with a NOK 300 fee for their time (approximately GBP 30).

Findings

Bottom-up meets top-down in vapers’ accounts of risk

The analysis presents three dimensions in the interviewees’ accounts of risk related to the use of e-cigarettes. First, they accounted for the risk perceptions of vaping as harm

reduction. Second, they dismissed the more ‘top down’ risk communication by perceived health authorities, as they often perceived their communication and the regulation as ‘anti-vaping’, and hence increasing risk by preventing smokers’ access to nicotine-containing products. Third, the interviewees emphasised the importance of lay-expertise on vaping. Finally, I discuss how the dissonance between the participants harm-reduction approach to vaping, and their devaluation of the top-down risk communication and regulation of e-cigarettes can be seen as contributing to a bottom-up movement among vapers.

Vaping as harm reduction

The interviewees represented a heterogeneous group in terms of vaper identities, ranging from ambivalent, pragmatic substitute users to dedicated vapers engaged in the hobby and of vaping as a sub-culture. However, despite their various user patterns and characteristics, they shared important common perceptions of risk in their accounts. Their risk perceptions were interlinked with their former smoker status, and they considered the switch from tobacco cigarettes to e-cigarettes as health improving. Nils (28), for example, stated: *I perceive them [the e-cigarettes] as health promoting and as an investment for our welfare state when the alternative so obviously is cigarettes.* Many echoed Nils, and a distinction between e-cigarettes and tobacco cigarettes was at the centre of the majority of the adult vapers’ accounts. They described how vaping was superior in smoking cessation, and how vaping had relieved them of a series of health hazards, ranging from constant colds, chest pain, and poor physical condition to a loss of their sense of taste. Emma described a common version of the transition to e-cigarettes:

I started smoking when I was very young to appear cool. I didn’t become cool, I became addicted. From 2009 I started my non-stop history with failed attempts to quit. I used those band-aids, Champix tablets, Nicorette inhalator, nicotine gum, I tried everything from 2009 to 2013. Nothing worked; I was not able to stop. It has to do with the fumbling, the psychological more than the physical dependence. Then I got an e-cigarette. I thought, “I never gonna quit because of this”, but I haven’t smoked since. (Emma, 27)

The e-cigarettes were perceived as both a functional and vital smoking substitute. Several dimensions in Emma’s account resonated with the overall data, such as the feeling of decreasing acceptance of smoking in society, managing an addiction, experience with failed cessation attempts and, importantly, e-cigarettes as superior to traditional nicotine replacement (NRT) products in smoking cessation. Similarly to Emma, the interviewees commonly structured their narratives with a clear ‘before’ and ‘after’ being introduced to e-cigarettes. In addition to health as a focal point in many of these accounts, the stigma attached to their former smoking habit was an additional dimension that traversed the data. Emma continued from the turning point like this:

Suddenly I noticed that people did not label me as a smoker anymore – they couldn’t label me because I didn’t smell. It was such a relief getting rid of the social stigma, to be able to hold my head high and not be the victim of socially acceptable bullying.

Emma perceived e-cigarettes as important in coping with the incriminating stigma attached to smoking. Several interviewees echoed Emma in describing stigmatisation and the lack of the ‘ugly’ smell when vaping. In addition, many talked about the importance of e-cigarettes not possessing the dimension of causing harm to others posed by conventional cigarettes.

Intertwined with the perceived low status of tobacco cigarettes, the controversies of how e-cigarettes ought to be defined were addressed. There was an evident ambiguity to the term 'e-cigarette' in their accounts. Statements such as Kenneth's (34) were common: *Vaporisers is the right term. This [referring to his e-cigarette] is not a cigarette.* In general, the term e-cigarette was perceived as misleadingly connoted with harmful and stigmatised smoking. Despite health being a focal point for the transition from smoking to vaping, most still rejected labelling e-cigarettes as a medical product. Ola said: *You can say that e-cigarettes are a smoking substitute and a product for pleasure. It is certainly not a medical product!* (Ola, 32). The harm-reduction dimension of the e-cigarettes was connected to their appeal, and the appeal to the fact that they were not a prescribed therapeutic remedy. Several interviewees instead suggested defining e-cigarettes as a pleasurable consumer good, stating that the e-cigarette and the e-liquid are neither harmful tobacco nor a medical product.

The interviewees' risk perceptions of vaping also conflicted strongly with the risk controversies suggesting that vaping could lead to renormalisation or serve as a gateway. Ingrid was provoked when questioned about this:

If you start with e-cigarettes, there is no chance in hell that you will switch to tobacco cigarettes. Because it's not the same; it's not the same way of inhaling, it's not the same taste, it would hurt in comparison. (Ingrid, 41)

Ingrid rejected the idea of e-cigarettes renormalising smoking or serving as a gateway to smoking by highlighting the differences. Emphasising the lack of similarities was a common response. For example, interviewees focused on the relative risk by stating how much more harmful smoking was for the body, as well as the bad smell and distastefulness of smoking compared to the use of e-cigarettes. The negative normative climate around smoking was also a commonly used argument for dismissing the gateway and renormalisation theses. As Edward (25) stated: *Smoking is decidedly uncool. Smoking and vaping are just two very different things.* Their identity as former smokers was visible in their accounts, and they highlighted smokers as the target group for e-cigarettes. However, several stated that, if young people were to try a nicotine-containing product, e-cigarettes would be preferable to tobacco cigarettes:

Young people have always wanted to test new things, especially if it's unavailable. And even though I would never encourage it, vaping is by far a better alternative than smoking. If they were to prohibit e-cigarettes because young people might start vaping, then they need to prohibit a lot of things. Why are cigarettes allowed? Why is alcohol allowed? How can they sell red wine if young people can turn into alcoholics? It is so unfair and it is not a valid argument! (Rita, 34)

Rita pointed to adolescence as a time for experimentation and maintained her perception of e-cigarettes as substantially less harmful than smoking. In addition, she displayed her frustration over the strict regulation of e-cigarettes in Norway, by attempting to discredit the perceived contrary position with whataboutery. Rolf continued in the same vein: *It's naive to think young people won't try any nicotine products, and it's better if they try e-cigarettes rather than cigarettes.* In general, interviewees gave ambivalent accounts on how non-smoking adults and non-smoking youth might become consumers of e-cigarettes. On the one hand, they argued that e-cigarettes are relatively safe and their use unproblematic. On the other, they dismissed the whole issue as irrelevant, stating that e-cigarettes only appeal to those with an existing addiction. However, in terms of young

people who otherwise might have taken up smoking, the majority presented e-cigarettes as a better alternative. Their negotiation of the risk of vaping is hence best captured by understanding their harm-reduction approach to vaping: many described the pleasure and the appeal of vaping, but still asserted harm reduction by switching from conventional cigarettes to e-cigarettes to be the most important underlying motive.

Dismissal of health authority messages

The interviewees generally shared a common narrative of taking responsibility for their own health by substituting smoking with vaping, and perceived the health authorities as failing to facilitate, support and acknowledge it. ‘Health authorities’ emerged as a collective term that commonly included and entangled Norwegian legislators and health officials, including researchers, holding a critical approach towards e-cigarettes.

How can they say that e-cigarettes don’t work as an aid to quitting smoking? They don’t know what they are talking about! It really gets to me. I would not have been able to quit without my vaporizer. (Jack, 40)

According to Jack, ‘they’, referring to the health authorities, undermined the role of e-cigarettes in smoking cessation. In addition, Jack perceived that ‘they’ lacked proper knowledge of e-cigarettes and vaping. Several interviewees echoed this view. In these accounts, the public information on e-cigarettes conflicted with their personal experience of the harm-reduction side of e-cigarettes as a pleasurable and well-functioning smoking substitute. Hence, the frustration and reactance evident in these accounts seemed to be interlinked with the interviewee’s former smoker status: they reported feeling stigmatised as smokers, and then they reported not feeling acknowledged as vapers. In addition, they were upset over the lack of clear communication on the relative harm of these products. Anne expressed it as follows:

How can the health authorities not communicate how much less health-damaging this is [referring to her vape-pen] compared to smoking? There is no tar in this, no toxic metals and carcinogens, no combustion. It’s just unbelievable! (Anne, 33)

Anne had a hard time understanding why e-cigarettes were not offered to smokers who wanted to stop smoking. She continued to talk about what she perceived as misleading risk communication in the form of newspaper headlines stating that use of e-cigarettes could lead to cancer, vaping being the same as – or worse than – smoking and the lack of both pro-vaping information and availability of products in physical stores. Several accounts echoed Anne’s critique of what they perceived as negative media coverage of risk of e-cigarettes. Martin stated:

We lose all the smokers who read all the wrong headlines on vaping in the newspaper. It’s frustrating with all the misconceptions: all the ignorant people claiming that you are still smoking when that is so completely wrong. Yes, you have the vapour coming out, but this has nothing to do with combustion. (Martin, 40)

The interviewees’ accounts of the risk communication of vaping frequently ended up negotiating how the mixed media content, health institutions’ lack of harm-reduction-communication and the present regulatory status of nicotine-containing e-liquids, affected the public’s views of e-cigarettes and vapers. In addition, the present market

situation was perceived as having negative impacts, in that it kept smokers away from the less harmful e-cigarettes, as well as creating uncertainty around the quality of existing products. In addition the importance of distinguishing between vaping and smoking-products was also evident in this regard, as they perceived the definition and regulation of e-cigarettes to be interlinked. Monica stated:

They [public regulators] have handled e-cigs in a messy and confusing way. You have some drug legislation and then you have some tobacco legislation, despite e-cigarettes being neither medicine nor tobacco. (Monica, 22)

Monica described what she perceived as disorganised and unclear labelling of e-cigarettes. In general, the vapers were unhappy with the prohibition against selling nicotine-containing e-liquids in Norway, as the prohibition resonated poorly with their risk perceptions. Rather they reported availability as important, not only for current users, but particularly for all the remaining smokers.

This [referring to his e-cigarette] should be sold over the counter, like a slightly more regulated kiosk product. The prohibition is unbearable and that it hasn't been changed yet is unbelievable to me! (Nils)

The enormous potential e-cigarettes have to save lives is heavily curbed by the [Norwegian] sales restrictions. I will go so far as to say that it is completely unethical and irresponsible of the Ministry of Health. They are neglecting the smoking population. (Rita, 34)

Nils and Rita critically expressed their dissatisfaction with the present situation and the health authorities. The repeated account was that the government should help smokers switch from conventional cigarettes to e-cigarettes, but instead vapers were forced into buying nicotine-containing e-liquid and vaporisers online, or abroad. According to them, this created a harmful barrier to swapping ordinary cigarettes for e-cigarettes. The interviewees also presented low availability as an important explanation for the low vaping prevalence in Norway. The elderly and the marginalised were often referred to as '*the losers*' in the present regulatory regime. Moreover, some interviewees expressed fear and uncertainty for their own future vaping:

I must admit that I worry a lot about how the government will end up regulating e-cigarettes in the future. I'm so grateful for the existence of e-cigarettes, if it wasn't for them I would never have become smoke-free (Tone, 49).

I just hope that the health authorities value our right to remain smoke-free and that they take our health seriously (Lotta, 43).

Tone and Lotta talked about the distress of stricter future regulations, such as prohibition against importing nicotine. In their accounts, vaping was framed as the only alternative to smoking. Data revealed a cost connected to what the interviewees perceived as uncertainty and inconclusive treatment of e-cigarettes at the time of the interviews. As Roger (44) said: *If they take the wrong path with the regulation, they create an unnecessary disaster – or to be more accurate – thousands of them.* Accounts such as Roger's imply that the interviewees believed in regulation and, in general, they agreed that a certain level of regulation of e-liquids and e-cigarettes was important. However, they argued that the regulation should mirror the risk; they suggested measures such as setting the

minimum age for purchasing e-cigarettes to 18 [same as for tobacco products], child-proof containers for e-liquids, content declarations and battery controls.

When I buy the nicotine-containing e-liquids, I can't know for sure who made them. I can't know if the people producing juice in England are doing it in their backroom, whether they have clean hands or mix it in a dirty bowl. (Monica, 22)

Monica described what she perceived as the present regulation leading to unnecessary increased risk from vaping by decreasing consumer safety. Online purchases from various sources allowed for products of lesser quality, uncertainty around the content of e-liquids and lack of transparency in the manufacturing process. Kenneth (34) reported on the room for improvement with regard to both the health authorities' risk communication and their future regulation of e-cigarettes, and said: *If they [the health authorities] do it right this time, it will help many people quit. This could be the invention that finally ends the tobacco pandemic.* In general, the vapers seemed to perceive the health authorities as lacking in their knowledge of e-cigarette-related matters, such as the importance of numerous independent distributors for keeping the price low and maintaining appeal through product diversity.

A bottom-up movement celebrating lay expertise

Across various age groups and social backgrounds, the risk communication and treatment of e-cigarettes appeared to fail to resonate with their own experiences of improved health. In general, the interviewees' negative perception of the public risk communication of e-cigarettes seemed connected to a discrepancy between their harm-reduction approach to e-cigarettes, on the one hand, and the Norwegian health authorities risk communication and regulation' being more aligned with the precautionary principle, on the other:

The best would be if the information from the public sector were accurate, but that ship sailed long ago. Today we just have these two alternative lines from them: the moralists or the precautionary principle. Even though the public health authorities should be responsible for providing the public with accurate information to enable us to make the right decisions, it seems they just fail completely and leave it up to us to seek this information through other channels. (Rolf, 25)

Rolf described the health authorities as moralists who have failed to inform the public of safer alternatives to smoking. The interviewees in general talked about how the dominant focus on the uncertainty of long-term health effects of vaping came with a 'high price' both for themselves as vapers having to defend their vaping, and also, and for the smokers who were not informed of the relative harm and hence were less likely to switch. Importantly, Rolf also reported on how the present situation made vapers search for information elsewhere. Several of the adult vapers echoed this and highlighted the importance of getting information from alternative sources:

I have vaped for two years thanks to help and support from the vape forum. If it wasn't for them, I would never be able to stick to e-cigarettes and quit smoking. They provide support, information on equipment and a community. From my point of view, vape forums are more important in the fight against tobacco smoking than the health authorities' campaigns and pages. On forums, everything is presented as more nuanced and not as politically coloured as the information from the health authorities. (Kåre, 51)

Vape forums and YouTube were described as important and more ‘neutral’ channels for vape-related information in contrast to the ‘top down risk communication’ in Norway. Similarly, to Kåre, several of the interviewees followed forums and/or vape-related profiles on YouTube in order to learn and stay up-to-date. In these accounts, it became evident that forums served as an entry point for many smokers into the world of e-cigarettes. The purpose of such vape forums was delineated as a way to learn how to navigate in the product jungle, learn how to use e-cigarettes and the various components such as coils, batteries, e-liquids and safety procedures. Vape forums were also arenas where participants shared up-to-date information on relevant research, media coverage of e-cigarettes and the present regulatory landscape.

Especially among some of the most dedicated vapers in the sample, the lack of pro-vaping information in the ‘top-down’ risk communication, was framed as creating a bottom-up movement. These vapers displayed a more organised ‘revolt’ against the authorities and described how they advocated the vape cause. Their activity was primarily visible online and made possible by user-edited platforms, such as vape forums and Facebook. They talked about the importance of more organised communities that had dispensed with traditional means of determining trustworthiness, based on information from the health authorities, in favour of digital tools and new network approaches. Oscar and Martin expressed it as follows:

The Facebook pages of the Norwegian vape society are a ‘must’ when it comes to uniting vapers in the fight for the vape cause. As a user, you are educated in vaping and as a group, you can influence. (Oscar, 29)

Without social media, vaping would not be where it is today. Forums were the place to go for information and help in Norway in the beginning. Few would have known so much about vaping without these networks. As the press have been limiting vapers’ access to the media, user groups online are invaluable for the products and the users. (Martin, 40)

Martin pointed to how social media was a go-to-place for vaping-related information. The national health authorities and the media were perceived by several interviewees as having ‘prevented them’ from easy access to ‘valid’ public information on e-cigarettes. Moreover, as the interviewees had managed a switch from smoking to vaping in the present regulatory and discursive landscape, some accounted for a feeling of responsibility to help the ‘unenlightened’ smokers. Oscar stated how, as a vaper, he possessed knowledge, and how vapers as a group became empowered. Hence, the public risk communication on vaping was not only framed as preventing smokers from quitting, but also as having a role in creating virtual platforms and vaping communities. These interviewees repeatedly described vape forums as a more trusted place for gathering information compared to public channels.

There is research spreading doubt about the effectiveness of vaping in smoking cessation. If I hadn’t stumbled upon a vaper forum and got in touch with other vapers, I wouldn’t have been smoke-free for the last two and half years. (Andre, 45)

Andre was one of the dedicated interviewees who acknowledged the importance of the forum for managing his switch from combustible cigarettes to e-cigarettes. Among the interviewees who participated in vape forums, the social interaction in these settings was contrasted with the ‘negatively biased’ health authorities’ risk communication; they described the forums as empowering, in that members experienced increased control

over their own health because of the positive risk communication and the supportive actions characteristic of these environments.

The findings seemed to reflect the interviewees' various vaper identities; those who described feeling part of a community were also more likely to describe feeling more proud and more confident in their use of e-cigarettes, compared with the more pragmatic and defensive substitute users who saw their vaping as a private act, and displayed their frustration in the form of a more solitary complaint. In sum, participants' perceptions of the present regulation and risk communication were of increasing rather than preventing risk. Moreover the importance of lay expertise in this context, resonated not only with the experience of devaluation of official risk communication about e-cigarettes, but also as contributing to a bottom-up vaping movement.

Discussion

By exploring how thirty adult vapers negotiate risk and perceive the risk communication on the use of e-cigarettes in Norway, I identified three dimensions that resonated across the data and various user identities: first, the importance of vaping as harm reduction. Second, a devaluation of the health authorities' risk communication and regulation as anti-vaping. Third, the vapers' perceptions of lay expertise as more trustworthy than 'top down' risk communication.

The Norwegian setting is contextually relevant for the discussion of the findings. This context includes illegality of nicotine liquids and health authorities who traditionally have (with exceptions) based their risk communication on the precautionary principle, hence been reluctant towards adopting perspectives of relative risk and harm reduction in their risk communication on use of tobacco products (including snus and e-cigarettes). The understanding of e-cigarettes in relation to health and risk largely depends on the perspective underlying the argumentation; particularly whether we view e-cigarettes as a less hazardous smoking substitute or an isolated consumer product with potential harmful side effects following use.

Researchers and health authorities advocating the precautionary principle will typically be reluctant to recommend e-cigarettes as a smoking substitute and call for awareness in the adoption of e-cigarettes (Cai & Wang, 2017; Glantz & Bareham, 2018; Reidel et al., 2018). Conversely, being a current user of a product is associated with an optimistic bias (Masiero et al., 2015). In the interviewees' accounts of risk perception, vaping is harm reduction and, from the same perspective, they perceive the precautionary principle, the 'negative' risk communication and 'strict' regulation as creating risk by generating uncertainty that may prevent smokers from switching to a less harmful product. The elderly and the marginalised smokers were often referred to as '*the losers*' in this context, aligning with the literature that portrays the remaining smokers as middle-aged persons of low educational attainment living in rural areas (Peretti-Watel, Seror, et al., 2014b).

Moreover, the interviewees' former smoker status in a smoking-hostile environment is also relevant for the analysis. Numerous studies have identified the increasing stigma attached to conventional smoking (Peretti-Watel, Legley et al., 2014; Sæbø, 2017; Sæbø & Scheffels, 2017). The interviewees accounted for feeling as 'outsiders' and being socially acceptable victims of bullying when they previously smoked. Stigmatisation can lead to an 'outsider' position (Goffman, 2009) with the potential to explain some of the frustration, reactance and opposition present in the interviewees' accounts. In terms of

stigma, the participants' former-smoker status speaks to a more general conception of the individual's responsibility for avoiding health risks for the sake of their own health, as well as for the greater good of society (Lupton, 1993, p. 433). The vapers perceived that they had taken responsibility for their health by substituting cigarettes with e-cigarettes; however, instead of recognition, they accounted for the health authorities' lack of support. In terms of opposition, their former smokers' status was evident in the construction of 'them' and us' The authorities were simplistically presented as anti-vaping and unenlightened, despite the health authorities themselves being divided in their approach to the controversies attached to vaping (Green et al., 2018).

Lupton describes risk definitions as hegemonic conceptual tools that can maintain power structures in society (Lupton, 1993). According to Lupton (1993, p. 432), the laypeople's perspective is rarely accorded an equal hearing with that of big business and politicians. Moreover, risk controversy is of interest to the media (Sandman, 1993). Motivated by attracting readers, the media can use negative headlines to over-dramatise or simplify information about health risks, leaving the general public confused (Lupton, 1993). In this study, the interviewees' emphasised how negative- and mixed risk-communication of use of e-cigarettes in the media created uncertainty in the public around the harmfulness of vaping, which in turn affected the social meanings of vaping and their status as vapers. The public media could, in addition, influence and shape public policy by setting an agenda for the public discussion of risk.

My findings from exploring risk from the vapers' perspective also imply that messages from public health channels can be undermined and overlooked. The most dedicated vapers in the study were most likely to express an outspoken and organised opposition towards the Norwegian health authorities' handling of e-cigarettes. Their dissatisfaction was manifested as distrust in their risk communication, which they perceived as too anti-vaping with a dominant negative focus on e-cigarettes. More broadly, a narrative of insecurity about the long-term health effects of vaping may decrease the adoption of e-cigarettes (Pepper et al., 2017).

The participants in my study generally described vapers as the experts on vaping, possessing 'lay expertise' with their special knowledge based on their personal and cultural experiences (Lupton, 1999). As a consequence of the lack of trust in health authorities, many relied on consumers' expertise concerning e-cigarettes by gathering information online, often from forums or on YouTube. These findings reflect other studies that have identified how increased use of the internet has led to greater self-sufficiency (Lankes, 2008; Morris & Anderson, 2015). The information available on online networks marks a general shift in perceived credibility away from traditional authority models, to reliability approaches with increased room for user participation (Lankes, 2008). Similar processes of devaluing the expertise of health authorities are identified in other studies exploring substance-oriented forum-cultures (Bilgrei, 2019; Boothroyd & Lewis, 2016; Soussan et al., 2018).

Despite this study being set in a Norwegian context, the devaluation of health authorities information echo findings derived in different regulatory contexts (Annechino & Antin, 2016). The interviewees in this group describe being part of a movement where vapers are offering lay expertise to smokers to cater for a lack of public support and availability. Vaping forums and YouTube play a significant part in this, as important channels for what the participants perceive as trustworthy vape-related information. At the same time vaping companies seem to use this context – of uncertainty and challenged authority – as an opportunity, by promoting e-cigarettes through

social media influencers with status among peer-followers (Daniel et al., 2018), and YouTube (Willis et al., 2017). The lay expertise represents guidance in a bewildering context, marked by rapidly evolving product technology and new products entering the market (Niaura, 2018). In line with this, vaper forums are reported to be places for receiving support online and advice, hence my understanding of these social contexts in terms of ‘vaping as a bottom-up movement’. Such developments point to a more general shift in risk communication on substance use, where the bottom-up structures of online communities not only seem to evolve as a reaction to top-down control, but also can challenge the discourse on risk matters and harm reduction in substance use.

There are limitations to the study. Firstly, this study are based on a sample of Norwegian adult vapers perceptions in a pre-TPD context, with restricted access to nicotine containing e-liquid, hence the viewpoints presented by the interviewees are not necessarily representative of the wider population of vapers. Secondly, data were collected over an extended period of time (2014–2018), and this may raise concerns about datedness, given the high level of innovation and changes characterising the field of e-cigarettes (Farrimond, 2017). However, there were highly consistent patterns in the interviewees’ accounts of risk throughout the period. Nevertheless, there is a need for studies exploring vapers’ perceptions’ of risk and risk communication of e-cigarettes in different jurisdictional and moral contexts, as well as for studies of how those currently smoking tobacco cigarettes understand and perceive risks associated with vaping.

Conclusion

In the study above I have found evidence that controversies around technologies – in this case, e-cigarettes – can enlarge the gap between public health authorities and users of e-cigarettes. In the study, a dissonance between vapers’ risk perceptions of e-cigarettes as harm reduction, and their perceptions of the regulations, negative risk communication and lack of assistance from the health authorities, have contributed to a bottom-up health movement based on peer assistance. Related processes of distrust can lead to a devaluing of messages from health authorities, and may hence extend challenges in risk communication and public health governance. A way of addressing such a trust-gap could be to consider examining more closely why harm reduction in the field of tobacco seems to have developed such a controversial status.

Disclosure statement

No potential conflict of interest was reported by the author.

Funding

This work was supported by Dam Foundation [2015/FO5245].

References

- Abate, C. (2017). Tobacco companies taking over the E-cigarette industry. *Huffpost*. https://www.huffpost.com/entry/tobacco-companies-taking-over-the-e-cigarette-industry_b_58b48e02e4b0658fc20f98d0
- Abrams, D. B., Glasser, A. M., Pearson, J. L., Villanti, A. C., Collins, L. K., & Niaura, R. S. (2018). Harm minimization and tobacco control: Reframing societal views of nicotine use to

- rapidly save lives. *Annual Review of Public Health*, 39(1), 193–213. <https://doi.org/10.1146/annurev-publhealth-040617-013849>
- Adekola, J., Fischbacher-Smith, D., & Fischbacher-Smith, M. (2019). Light me up: Power and expertise in risk communication and policy-making in the e-cigarette health debates. *Journal of Risk Research*, 22(10), 1294–1308. <https://doi.org/10.1080/13669877.2018.1473463>
- Amrock, S. M., Zakhar, J., Zhou, S., & Weitzman, M. (2014). Perception of e-cigarette harm and its correlation with use among US adolescents. *Nicotine & Tobacco Research*, 17(3), 330–336. <https://doi.org/10.1093/ntr/ntu156>
- Annechino, R., & Antin, T. (2016, November). Taking sides in E-cigarette research. *Ethnographic Praxis in Industry Conference Proceedings, 2016(1)*, 105–119. <https://doi.org/10.1111/1559-8918.2016.01079>
- Bareham, D., Ahmadi, K., Elie, M., & Jones, A. W. (2016). E-cigarettes: Controversies within the controversy. *The Lancet Respiratory Medicine*, 4(11), 868–869. [https://doi.org/10.1016/S2213-2600\(16\)30312-5](https://doi.org/10.1016/S2213-2600(16)30312-5)
- Bell, K., & Keane, H. (2012). Nicotine control: E-cigarettes, smoking and addiction. *International Journal of Drug Policy*, 23(3), 242–247. <https://doi.org/10.1016/j.drugpo.2012.01.006>
- Bilgri, O. R. (2019). Community-consumerism: Negotiating risk in online drug communities. *Sociology of Health and Illness*, 41(5), 852–866. <https://doi.org/10.1111/1467-9566.12864>
- Boothroyd, D., & Lewis, S. (2016). Online drug scenes and harm reduction from below as pronesis. *Contemporary Drug Problems*, 43(3), 293–307. <https://doi.org/10.1177/0091450916654266>
- Cai, H., & Wang, C. (2017). Graphical review: The redox dark side of e-cigarettes; exposure to oxidants and public health concerns. *Redox Biology*, 13, 402–406. <https://doi.org/10.1016/j.redox.2017.05.013>
- Charmaz, K., & Belgrave, L. (2012). Qualitative interviewing and grounded theory analysis. *The SAGE Handbook of Interview Research: The Complexity of the Craft*, 2, 347–365.
- Daniel, E. S., Jr., Crawford Jackson, E. C., & Westerman, D. K. (2018). The influence of social media influencers: Understanding online vaping communities and parasocial interaction through the lens of Taylor’s six-segment strategy wheel. *Journal of Interactive Advertising*, 18(2), 96–109. <https://doi.org/10.1080/15252019.2018.1488637>
- Denzin, N. K., & Lincoln, Y. S. (2008). *Strategies of qualitative inquiry* (Vol. 2). Sage.
- Drope, J., & Schluger, N. W. (2018). *The Tobacco atlas* (6th ed.). American Cancer Society.
- Fagerstrom, K., Etter, J.-F., & Unger, J. B. (2015). *E-cigarettes: A disruptive technology that revolutionizes our field?* Oxford University Press UK.
- Fairchild, A. L., Bayer, R., & Colgrove, J. (2014). The renormalization of smoking? E-cigarettes and the tobacco “endgame”. *New England Journal of Medicine*, 370(4), 293–295. <https://doi.org/10.1056/NEJMp1313940>
- Farrimond, H. (2017). A typology of vaping: Identifying differing beliefs, motivations for use, identity and political interest amongst e-cigarette users. *International Journal of Drug Policy*, 48, 81–90. <https://doi.org/10.1016/j.drugpo.2017.07.011>
- Gilreath, T. D., Leventhal, A., Barrington-Trimis, J. L., Unger, J. B., Cruz, T. B., Berhane, K., Urman, R., Wang, K., Howland, S., Pentz, M. A., Chou, C. P., McConnell, R., & Huh, J. (2016). Patterns of alternative tobacco product use: Emergence of hookah and e-cigarettes as preferred products amongst youth. *Journal of Adolescent Health*, 58(2), 181–185. <https://doi.org/10.1016/j.jadohealth.2015.10.001>
- Glantz, S. A., & Bareham, D. W. (2018). E-cigarettes: Use, effects on smoking, risks, and policy implications. *Annual Review of Public Health*, 39(1), 215–235. <https://doi.org/10.1146/annurev-publhealth-040617-013757>
- Glaser, B. G., Strauss, A. L., & Strutzel, E. (1968). The discovery of grounded theory; strategies for qualitative research. *Nursing Research*, 17(4), 364. <https://doi.org/10.1097/00006199-196807000-00014>
- Goffman, E. (2009). *Stigma: Notes on the management of spoiled identity*. Simon and Schuster.
- Gowing, L. R., Ali, R. L., Allsop, S., Marsden, J., Turf, E. E., West, R., & Witton, J. (2015). Global statistics on addictive behaviours: 2014 status report. *Addiction*, 110(6), 904–919. <https://doi.org/10.1111/add.12899>
- Green, L. W., Fielding, J. E., & Brownson, R. C. (2018). The debate about electronic cigarettes: Harm minimization or the precautionary principle. *Annual Review of Public Health*, 39(1), 189–191. <https://doi.org/10.1146/annurev-publhealth-102417-124810>

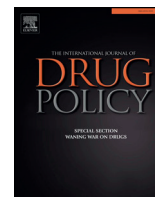
- Hajek, P., Etter, J. F., Benowitz, N., Eissenberg, T., & McRobbie, H. (2014). Electronic cigarettes: Review of use, content, safety, effects on smokers and potential for harm and benefit. *Addiction*, *109*(11), 1801–1810. <https://doi.org/10.1111/add.12659>
- Hart, W., Albarracín, D., Eagly, A. H., Brechan, I., Lindberg, M. J., & Merrill, L. (2009). Feeling validated versus being correct: A meta-analysis of selective exposure to information. *Psychological Bulletin*, *135*(4), 555. <https://doi.org/10.1037/a0015701>
- Kennedy, R. D., Awopegba, A., De León, E., & Cohen, J. E. (2017). Global approaches to regulating electronic cigarettes. *Tobacco Control*, *26*(4), 440–445. <https://doi.org/10.1136/tobaccocontrol-2016-053179>
- Lankes, R. D. (2008). Trusting the internet: new approaches to credibility tools. In Metzger, M.J. and Flanagin, A.J. (eds.) *Digital Media, Youth, and Credibility*, 101–122. Cambridge: The MIT Press.
- Lund, K. E. (2016). Article Commentary: The role of e-cigarettes in the tobacco endgame. *Nordic Studies on Alcohol and Drugs*, *33*(3), 241–242. <https://doi.org/10.1515/nsad-2016-0018>
- Lund, K. E., Tokle, R., & Vedøy, T. F. (2018). *Utbredelse av e-sigaretter og fordampere i Norge* <https://www.fhi.no/nettpub/tobakkinorge/bruk-av-tobakk/utbredelse-av-e-sigaretter-og-fordampere-i-norge/>
- Lupton, D. (1993). Risk as moral danger: The social and political functions of risk discourse in public health. *International Journal of Health Services*, *23*(3), 425–435. <https://doi.org/10.2190/16AY-E2GC-DFLD-51X2>
- Lupton, D. (1999). *Risk and sociocultural theory: New directions and perspectives*. Cambridge University Press.
- Masiero, M., Lucchiari, C., & Pravettoni, G. (2015). Personal fable: optimistic bias in cigarette smokers. *International Journal of High Risk Behaviors & Addiction*, *4*(1): e20939. <https://doi.org/10.5812/ijhrba.20939>
- Meyer, S. B., & Ward, P. R. (2009). *Reworking the sociology of trust: Making a semantic distinction between trust and dependence* [Poster presentation]. The Australian Sociological Association 2009 Annual Conference Proceedings, The Australian National University, Canberra: TASA)
- Morphett, K., Herron, L., & Gartner, C. (2019, April 21). Protectors or puritans? Responses to media articles about the health effects of e-cigarettes. *Addiction Research & Theory*, 1-8. <https://doi.org/10.1080/16066359.2019.1596259>
- Morris, M., & Anderson, E. (2015). ‘Charlie is so cool like’: Authenticity, popularity and inclusive masculinity on YouTube. *Sociology*, *49*(6), 1200–1217. <https://doi.org/10.1177/0038038514562852>
- National Academies of Sciences, E., & Medicine. (2018). *Public health consequences of e-cigarettes*. National Academies Press.
- Niaura, R. (2018). E-cigarette science and its relevance for regulatory actions and policy. *Nicotine & Tobacco Research*, *20*(8), 911–912. <https://doi.org/10.1111/1467-9566.12854>
- Nutt, D. J., Phillips, L. D., Balfour, D., Curran, H. V., Dockrell, M., Foulds, J., Letlape, K., Milton, A., Polosa, R., Ramsey, J., Sweanor, D., & Fagerstrom, K. (2014). Estimating the harms of nicotine-containing products using the MCDA approach. *European Addiction Research*, *20*(5), 218–225. <https://doi.org/10.1159/000360220>
- O’Riordan, T., Jungermann, H., Kasperson, R. E., & Wiedemann, P. M. (1989). Themes and tasks of risk communication: Report of an International Conference held at KFA Jülich. *Risk Analysis*, *9*(4), 513–518. <https://doi.org/10.1111/j.1539-6924.1989.tb01262.x>
- Panda, B. (2007). Top down or bottom up? A study of grassroots NGOs’ approach. *Journal of Health Management*, *9*(2), 257–273. <https://doi.org/10.1177/097206340700900207>
- Pearson, S., Mont, M. C., & Crane, S. (2005, May). Persistent and dynamic trust: Analysis and the related impact of trusted platforms. In *International conference on trust management* (pp. 355–363). Springer, Berlin, Heidelberg.
- Pepper, J. K., Emery, S. L., Ribisl, K. M., Rini, C. M., & Brewer, N. T. (2015). How risky is it to use e-cigarettes? Smokers’ beliefs about their health risks from using novel and traditional tobacco products. *Journal of Behavioral Medicine*, *20*(8), 318–326.
- Pepper, J. K., Lee, Y. O., Watson, K. A., Kim, A. E., Nonnemaker, J. M., & Farrelly, M. C. (2017). Risk Factors for Youth E-Cigarette “Vape Trick” Behavior. *Journal of Adolescent Health*, *61* (5), 599–605. <https://doi.org/10.1016/j.jadohealth.2017.05.010>

- Peretti-Watel, P., Legleye, S., Guignard, R., & Beck, F. (2014). Cigarette smoking as a stigma: Evidence from France. *International Journal of Drug Policy*, 25(2), 282–290. <https://doi.org/10.1016/j.drugpo.2013.08.009>
- Peretti-Watel, P., Seror, V., Verger, P., Guignard, R., Legleye, S., & Beck, F. (2014). Smokers' risk perception, socioeconomic status and source of information on cancer. *Addictive Behaviors*, 39(9), 1304–1310. <https://doi.org/10.1016/j.addbeh.2014.04.016>
- Reidel, B., Radicioni, G., Clapp, P. W., Ford, A. A., Abdelwahab, S., Rebuli, M. E., Haridass, P., Alexis, N. E., Jaspers, I., & Kesimer, M. (2018). E-cigarette use causes a unique innate immune response in the lung, involving increased neutrophilic activation and altered mucin secretion. *American Journal of Respiratory and Critical Care Medicine*, 197(4), 492–501. <https://doi.org/10.1164/rccm.201708-1590OC>
- Rooke, C., McNeill, A., & Arnott, D. (2012). Regulatory issues concerning the development and circulation of nicotine-containing products: A qualitative study. *Nicotine & Tobacco Research*, 15(6), 1052–1059. <https://doi.org/10.1093/ntr/nts235>
- Royal College of Physicians of London. Tobacco Advisory, G. (2007). *Harm reduction in nicotine addiction: Helping people who can't quit*. Royal College of Physicians of London.
- Sæbø, G. (2017). Cigarettes, snus and status: Differences in lifestyle of different tobacco user groups in Norway. *Health Sociology Review*, 26(2), 175–189. <https://doi.org/10.1080/14461242.2016.1197043>
- Sæbø, G., & Scheffels, J. (2017). Assessing notions of denormalization and renormalization of smoking in light of e-cigarette regulation. *International Journal of Drug Policy*, 49, 58–64. <https://doi.org/10.1016/j.drugpo.2017.07.026>
- Sandman, P. M. (1993). *Responding to community outrage: Strategies for effective risk communication*. AIHA.
- Soussan, C., Andersson, M., & Kjellgren, A. (2018). The diverse reasons for using Novel Psychoactive Substances - A qualitative study of the users' own perspectives. *International Journal of Drug Policy*, 52, 71–78. <https://doi.org/10.1016/j.drugpo.2017.11.003>
- SSB, Statistics Norway. (2018). *Røyk, alkohol og andre rusmidler*. <https://www.ssb.no/royk>
- Tokle, R., & Pedersen, W. (2019). “Cloud chasers” and “substitutes”: E-cigarettes, vaping subcultures and vaper identities. *Sociology of Health and Illness*, 41(5), 917–932. <https://doi.org/10.1016/j.drugpo.2013.08.009>
- Vedoy, T. F., & Lund, K. E. (2017). Selvrapporterte forsyningskilder for sigaretter, snus og e-cigaretter. *Tidsskrift for den Norske Laegeforening*, 137, 16–21. <https://doi.org/10.4045/tidsskr.16.0994>
- Warner, K. E., & Schroeder, S. A. (2017). FDA's innovative plan to address the enormous toll of smoking. *JAMA*, 318(18), 1755–1756. <https://doi.org/10.1001/jama.2017.14336>
- WHO. (2014). *Electronic nicotine delivery systems*. http://apps.who.int/gb/fctc/PDF/cop6/FCTC_COP6_10-en.pdf
- Willis, E., Haight, M. J., & Morris Ii, D. L. (2017). Up in vapor: Exploring the health messages of e-cigarette advertisements. *Health Communication*, 32(3), 372–380. <https://doi.org/10.1080/10410236.2016.1138388>



Contents lists available at ScienceDirect

International Journal of Drug Policy

journal homepage: www.elsevier.com/locate/drugpo

Research Paper

‘Vaping and fidget-spinners’: A qualitative, longitudinal study of e-cigarettes in adolescence

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ARTICLE INFO

Keywords:

E-cigarettes
Vaping
Adolescence
Qualitative Longitudinal study
Actor Network Theory
Interaction Ritual
Trend

ABSTRACT

Background: We see the contours of a cigarette-free adolescent cohort in Norway. Simultaneously, increasing use of vaping devices among adolescents internationally, and in the US in particular, has evoked fear of a new nicotine-addicted generation. This longitudinal study explores the vaping phenomenon in a context where nicotine e-liquid is still prohibited.

Methods: Data are from longitudinal, qualitative interviews with a sizable sample of 12-17 year olds (118 8th graders from 6 schools/classes at baseline). Four follow-ups were conducted from 2015 to 2019 (a total of 50 semi-structured group and 175 individual interviews). The interviews were coded using HyperResearch software and thematically analysed in the light of actor network and interaction ritual theory.

Results: Gradual and collective shifts in vaping practices and in the symbolic meaning of vaping were observed in three phases. First, in 8th grade, few had tried to vape, even if several were curious about this novel invention, practice and the available flavours. Second, after 9th grade, one in three reported personal use. They emphasised harmlessness, coolness, performance and accessibility online. However, by the end of middle school, a third phase became visible; vaping had lost status and was described as ‘childish’ and unpopular. Interviewees repeated the lack of relevance in high school, comparing e-cigarettes with the fidget-spinner and reserving vaping for kids and addicted adult smokers. The analysis displays a systematic pattern in which adolescents account for vaping as a time-limited trend.

Conclusion: E-cigarettes were devalued from novelty and transgression to childish and uninteresting within the same sample over a four-year period. In conclusion, e-cigarettes in the sample represented fashionable experimentation rather than steady user patterns.

Introduction

We see the contours of a cigarette-free generation of adolescents in Norway (Vedoy, 2015). Simultaneously, increasing use of e-cigarettes or vaping devices, especially among young people in the US, has evoked fear of new nicotine-addicted generations (Gilreath et al., 2016). Although vaping is found to occur among Norwegian adolescents (Lundberg, Kvaavik et al., 2019), we lack representative data and qualitative studies on e-cigarette use in this age group. The study offers a contribution to our understanding of young people's vaping, by exploring how the social meaning and usage of e-cigarettes evolves in a sizeable sample of Norwegian adolescents. Such knowledge of young people's perceived and evolving meaning of the technology and practices is important for identifying general attitudes, as well as mechanisms in and out of use.

In what follows, I provide context on e-cigarettes and young people's vaping. I then conceptualize the interwoven role of technology and

sociability in their vaping, drawing on Actor Network Theory (ANT) (Latour, 1987; 1994; 2005) and Interaction Rituals (IR) (Collins, 2004). I outline the restrictive Norwegian context, before presenting the methods. The study is based on extensive longitudinal, qualitative data (Brunborg et al., 2019). Through repeated interviews with adolescents from 2015 to 2019, the study identifies changes in perceptions and use connected with both the technical sides of e-cigarettes and the social sides of vaping.

E-cigarettes, vaping and young people

Studying the features of the e-cigarette is beneficial for understanding the meaning and appeal of vaping in adolescence. Originally e-cigarettes or ENDS (Electronic Nicotine Delivery Systems) were designed to replace combustible cigarettes (Hajek, Etter, Benowitz, Eissenberg, & McRobbie, 2014), as handheld electronic devices that allow users to inhale an evaporated flavoured liquid, often containing

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<https://doi.org/10.1016/j.drugpo.2020.102791>

nicotine (WHO, 2014). Studying understandings of these devices is however complicated by the rapidly moving commercial technology (Farrimond, 2017). The present e-cigarette market offers products with a wide variety of flavoured e-liquids, levels of nicotine and product versatility (Goniewicz, Hajek, & McRobbie, 2014). The ‘first generation’ of e-cigarettes, which largely mimicked smoking, has been overtaken by ‘second’ and ‘third’ generation devices, such as ‘mods’ or ‘tanks’ favoured by many users (Etter, 2016). The pod versions are among the newer vaporizers on the market, most notably those branded JUUL, which seem to particularly appeal to young people in the US (Huang et al., 2019). Relatedly, young people are found to view the e-cigarette as a product in its own right (Hardcastle et al., 2014; Measham, O’Brien, & Turnbull, 2016) and rather focus on flavours, product design and the opportunity to customize devices and show individuality (Hardcastle et al., 2014).

In parallel with the inventions of novel objects, new social practices have emerged. E-cigarettes are now the most commonly used tobacco product among young people in the US (Cullen et al., 2019). During the 2017–2018 period, the prevalence of current vaping (in the past 30 days) increased from 12 per cent to 21 per cent among US high school students. Similarly, data from the UK show that 23 per cent of 11–18 year olds have used e-cigarettes, but typically in an experimenting pattern. Only 1.6 per cent reported use more than once a week (ASH, 2019), indicating that the recent rise in adolescents’ use of e-cigarettes does not necessarily point to a new nicotine epidemic (Miech, Patrick, O’Malley, & Johnston, 2017). Moreover, in contradiction to the original conception of e-cigarettes as an alternative to combustible cigarettes, young people are found to be novel users of e-cigarettes, with no previous history with tobacco (Chapman & Wu, 2014), and to vape for reasons unrelated to conventional smoking (Evans-Polce et al., 2018). Rather, scholars have suggested that many young people use e-cigarettes for fun, to try something new (Hardcastle et al., 2014), or for the performative aspects of vaping (Measham et al., 2016).

Conceptualizing the agency of technology and sociability in adolescents’ vaping

ANT allows agency to be found in both human and nonhuman objects (actants). Hence, the ANT perspective provides attentiveness to how nonhuman objects such as the e-cigarette are part of – and evolve in – networks (assemblages) and how experiences pass through objects and act on users (Latour, 2005, p. 68). The ANT concepts of inscriptions and translations are of particular relevance in this study of vaping in adolescence. Inscriptions refer to how a technical object creates a user pattern by way of how the object facilitates its own use (Latour, 1987). Consequently, an object with a strong inscription will force use in a given way, whilst a weak inscription allows alternative user patterns than the ones originally intended by the creator. Translations refer to creating an inscription with the purpose of aligning the object or the assemblage in a given direction (Latour, 1994, pp. 32–41). E-cigarettes in the hands of non-smoking adolescents may indicate that e-cigarettes have weak inscriptions, given their original conception as a smoking substitute. This is further evident in studies identifying use for fun (Hardcastle et al., 2014) or performance and ‘cloud chasing’ (Farrimond, 2017; Tokle & Pedersen, 2019; Measham et al., 2016). Meanwhile, a translation of an inscription might be to decrease the availability of flavours in vaping devices. A relatable example from the tobacco field are the translations of the inscription of cigarette packets, through plain packets and the increased size of health warnings, in order to try to decrease package appeal (McNeill et al., 2017).

While ANT’s strength is making objects participants in the course of action (Latour, 2005 p.70), the IR perspective provides a supplementary analytical tool for investigating adolescents’ notion of the sociability of vaping. Collins (2004) partly meets Latour (2005) in acknowledging the importance that material objects can have in an IR. Membership

symbols is the label Collins uses for items upon which a group has focused attention during such rituals (2004, p. 150). Collins’ idea of focus is useful when exploring the meaning of e-cigarettes in adolescence. Following Collins, an IR “is the process in which participants develop a mutual focus of attentions and become entrained in each other’s bodily micro-rhythms and emotions” (Collins, 2004, p. 47). IRs create symbols of group membership, and represent boundaries of inclusion and exclusion (Collins, 2004, p. 297). Rituals, hence, can show how much solidarity and commitment to shared symbols will occur in a wide variety of situations, and how external conditions can shift the symbolic meaning and the strength of a social ritual (Collins, 2004). The shifting position of smoking in society, from status to stigma, serves as an example of such. Smoking, through the lens of IR, is a low-intensity ritual, defined as a practice that involves varying levels of formality and process. Depending on the social context, smoking has been interpreted as an elegance ritual as well as an anti-elite and toughness ritual (Collins, 2004). Correspondingly, vaping among young people has been identified as a low-intensity ritual, and been linked to both resistance and mechanisms for misbehaviour (Yule & Tinson, 2017).

Notably, when exploring adolescents’ vaping longitudinally, adolescence is in itself an important transformative, social context characterized by physical, mental, and psychosocial development and changes (Forehand & Wierson, 1993). Adolescents become increasingly concerned with peer-relationships during this developmental period (Vartanian, 2000), both in terms of conformity with peers and social acceptance (Forehand & Wierson, 1993).

The Norwegian context

Norway, which is the focus in this study, serves as a restricted regulatory context for vaping, in line with Australia and in contrast to the UK (Erku, Kisely, Morphett, Steadman, & Gartner, 2020). Nicotine-containing e-liquids are not available from domestic retailers, although adult consumers are allowed to import them for personal use. Vaping devices are legally available at selected shops for those over the age of 18. However, to evade the current regulation, the majority of adult users of e-cigarettes are found to purchase the nicotine, liquid and equipment from foreign retailers online (Vedoy & Lund, 2017). The ban on nicotine e-liquid is expected to be lifted in 2020, with the implementation of the Tobacco Product Directive (TPD). How these regulatory changes will affect use in adolescence is frequently debated in the media against the backdrop of increasing use among young people internationally, and the EVALI outbreak in the US in 2019.

The aim of this unique longitudinal study is to identify the evolving social meaning of vaping devices and usage in a sample of 12–17 year olds in the above-outlined context.

Methods

The data consists of interviews from the qualitative arm of the MyLife study, a prospective, longitudinal quantitative and qualitative study of young people’s development and substance use in Norway (Brunborg et al., 2019). To explore the perceived meaning of e-cigarettes and vaping, a sizeable sample from six schools from geographically and economically dispersed areas were recruited to participate with one 8th grade class each. Two schools were located in the north (N), two in the south-east (E) and two in the south-west (W) of Norway. The abbreviations of region (N/E/W), together with school number (1/ 2), are used in the findings to clarify the geographical location of each participant. In addition, two schools were rural, while four were located in urban areas. The analysis is based upon four rounds of group (T1, T2) and individual interviews (T3, T4) with the participants from 2015 to 2019. Experienced qualitative researchers (the author being one of them) conducted all interviews.

Data collection and sample

A pilot study was completed 1 year ahead of the main study schedule and informed decisions concerning the timing and balance of individual and group interviews, group sizes and composition. The pilot class (n = 13) is included in the overall sample, except at T2 due to incomparability with the main study, as the first pilot follow-up was carried out with the participants at a younger age and conducted as personal interviews. Group interviews were selected at the two first time points in the main study based on the participants' young age at study onset.

At baseline (T1), spring semester 2015 (main study), 26 semi-structured group interviews were carried out with 118 (58) boys and (60) girls, in 8th grade, age 12-13. First follow-up (T2), fall semester 2017, 24 group interviews (n = 85), was conducted when the participants were aged 14-15 years. Time 3 (T3), spring semester 2018 (main study), was conducted as individual interviews (n = 95), when the participants were in 10th grade, age 15-16. Finally, Time 4 (T4), spring 2019 (main study), was completed as individual interviews (n = 80) when the participants were 16-17 years old and in their first year of high school (for more details, see Brunborg et al., 2019).

T1-T3 interviews were carried out at the schools during school hours. At T4, the interviewees were contacted individually. Interview locations were decided based on participants' preferences, ranging from school areas, cafes and the interviewees' homes. Interviews lasted on average between 45 and 60 minutes. All interviews followed a semi-structured guide, in which participants were questioned about e-cigarettes, first in the form of general questions on their knowledge of e-cigarettes and use among peers, then personal experience. Those with lived experience were asked to elaborate on initiation, practices and exposure, such as: when, why, where, with whom, type of device, nicotine exposure and user patterns. In addition, both pupils who had vaped and those who had not were encouraged to elaborate upon how they perceived e-cigarettes and vaping. Field notes were written up after each interview, providing additional contextual data on aspects such as environment and appearance.

Attrition is a challenge in longitudinal studies (Farrall, Hunter, Sharpe & Calverley, 2015). 118 students were interviewed at T1 to ensure an adequate sample size throughout the study. Because of administrative recruitment issues, 20 participants were lost from T1 to T2 (pilot class included). Learning from these experiences, the attrition was minimized to 3 participants at T3. T4 recruitment was organized outside the school context, which increased the effort to partake in the study. Although all participants were contacted personally, 15 were lost from T3 to T4. All had changed schools, some had moved away, one had died. However, the selective attrition was kept to a minimum in that the heterogeneity in the sample was maintained, in terms of gender, location and inclusion of vulnerable participants.

Thematic analysis

All interviews were audiotaped, transcribed verbatim and systematically sorted using the HyperRESARCH software. Two researchers coded one third of the interviews to ensure that ambiguity in meaning was kept to a minimum. Coding involved developing a codebook consisting of 15 e-cigarette-related codes based on predefined themes from the interview guide, such as 'perceptions of e-cigarettes', 'own experience' and 'perceptions of vapers'. Thematic sub-codes such as 'relative risk' 'flavours' and 'symbolic meaning of vaping' were developed and added during the process of closely reading the transcripts. Data was initially thematically analysed based on the above-mentioned codes. After rounds of sorting and comparing codes, both for each code and time point, a pattern became evident in the large material in respect of how e-cigarettes and vaping changed their meaning for the participants over the study years. The ANT perspective guided the analysis process by increasing attentiveness to how they reported on the vaping devices,

and how these products acted on and integrated into the participants' practices (Latour, 2005; 2004), whilst IR (Collins, 2004) offered an analytical tool to investigate how the symbolic meaning of e-cigarettes and vaping played out in the sample. In addition to the coded interview transcripts, field notes contributed to the analyses in providing context to each interview, as well as to changes over time.

The study was approved by the Norwegian Data Protection Authority (reference no.:15/01495). Both parents and the participants gave their active informed consent. Identifying information, such as names and locations, was replaced with pseudonyms.

Findings and analysis

Vaping's symbolic journey from "transgressive" to "childish"

Outlined in three phases, the analysis shows the gradual and collective shifts in the agency of e-cigarettes and the social meaning of vaping in a group of Norwegian adolescents over four years. First, I present how the adolescents' accounts were marked by a distance to the vaping phenomenon. Second, I show how this distance was replaced by perceptions of vaping as a cool and established practice. Third, at T3, I show how vaping was suddenly perceived as a marginal activity, and how, at T4, the collective negotiated meaning of vaping as an uncool, out-group practice was further established. Findings are presented with awareness of the transitional context, and with attention paid to both the mediating role of the technological objects (e-cigarettes) inspired by the logic of ANT and the collective dimension of vaping through the lens of IR.

Technology, novelty and transgression

At baseline, the 12-13 year old participants had recently made their transition from elementary school to middle school, and described ambivalence about their new role as "more mature" and "no longer playing" in the school playground, as well as being the youngest in the school peer culture.

When asked about e-cigarettes, most had heard about them, but few had personal experiences of vaping. The inscription and the novelty, in terms of the product not yet being "black-boxed" as in normalized and a matter of indifference (Callon & Latour, 1981, p. 279), were present in the way they talked about e-cigarettes by actually describing what they were, as when Bjoern (T1.W1) stated: "*it's vapour, it's a vapour device*". In these accounts, a level of unfamiliarity was typically visible:

E-cigarettes? That's like those fake smokes, isn't it?" (Jorunn T1.N2),
 "E-cigarettes? That's vapour, right? Electronic ones? (Frank T1.W1).

From an ANT perspective, the way many replied in the form of a question highlighted the weak connections between the human and nonhuman actants (Latour, 2005). From a IR perspective (Collins, 2004), e-cigarettes seemed to have little membership significance. This distance was also evident in their accounts of being exposed to vaping by adults who used e-cigarettes for smoking cessation typically in the form of: "*My mum's boyfriend had one because he used to smoke*" (Kjersti T1.N2); or "*Mum bought one last year to quit smoking*" (Cecilie T1.N1).

In line with the quotes by Kjersti and Cecilie, vaping was primarily described as a means of quitting smoking, in accordance with the original inscription (Latour, 1987), and hence as a practice detached from their peer culture. However, a level of appeal was evident in the way some mentioned flavoured e-liquids. One of them, Halvor, eagerly talked about his first encounter with e-liquids after a visit to a store in Spain:

(...) *they had tobacco flavour, weird ones mixed with various flavours, and there was Coke and Red Bull flavour – and you can probably find them with cannabis-flavour and many more* (Halvor T1.W2).

The range of flavours seemed to increase curiosity by creating a

“wow” effect, highlighting another side of e-cigarettes’ inscription (Latour, 1987) as well as their novelty in the period. Flavours were also mentioned relative to conventional cigarettes, by way of increasing the attractiveness of e-cigarettes, as expressed by Roald:

I think e-cigarettes are cooler. It sounds cool to use, to breathe out watermelon-smoke, just without the harmful substances in it, but it's not like I want to order it (Roald T1.N1).

Roald stood out in the group interview due to his oppositional, too-cool-for-school attitude, where he refused to take his headset off during the interview. In line with Roald, several interviewees reported adolescents’ rationales for using e-cigarettes as being related to perceived harmlessness, with emphasis on the lack of nicotine, and perceptions of vaping as cool. Halvor said:

I want to start with e-cigarettes, with strawberry flavour, but without nicotine. I have seen it on YouTube. Those making rings out of the mouth. You can practise and stuff (Halvor T1.W2).

Halvor linked his curiosity to exposure on social networking sites (SNS), and asserted what the vaping devices allowed him to do. SNS emerged as an important translator in the network between curious adolescents and the vaping product, as several described learning about e-cigarettes from sources online. Moreover, Katrine said: “*I think young people use them to appear cool*” (Katrine T1.N2). Using e-cigarettes to enhance one’s image as ‘cool’ has previously been identified as a feature of young people’s use in a UK study (Hardcastle et al., 2014).

Whether located in the north, south-east or south-west of the country, the minority with positive attitudes, such as Roald and Halvor, shared some similarities. They were most often boys; they exhibited a level of opposition towards authority and seemed to value a ‘tough image’ in their way of dressing and talking of not caring for school, together with a level of curiosity towards substance use. Such oppositional denotations of vaping were echoed in the general sample:

I have seen this girl, a 9th grader, she has started vaping. She often hangs out in the city late. I even heard her talk about alcohol (Erling T1.E2).

Erling paired vaping with boundary-testing activities. The transgressive status of vaping became visible in the way several participants connected its use to those seemingly perceived as tougher peers. Trond expressed it like this:

The 9th and 10th graders use them at school, they don't even care, especially not the ones sitting in the chief coach [referring to the spot reserved for pupils at the top of the school popularity hierarchy], they just sit there and barely bother to attend classes (Trond T1.N1).

In Erling’s and Trond’s accounts, vaping was associated with a selected group of oppositional peers. Hence e-cigarettes’ cool connotation in the hands of adolescents emerged as interlinked with a symbolic meaning signalling both counterculture and opposition. Moreover, this symbolic meaning seemed to connote transgression in line with what has previously been identified with the smoking ritual (Turbin, Jessor, & Costa, 2017), but with a renewed focus on the performance. Hence, drawing on Collins (2004, p. 49), the majority of the participants reserved the focus on e-cigarettes to selected groups of ‘others’, namely the adult smokers or oppositional peers. In addition, following Latour (1987; 2005), these descriptions implied an altered inscription of the technical object for some, as the smoking substitute for adults translated to an object that also could act on young people within the network of SNS and oppositional peers.

In summary, it was the novice perspective on both the school context and e-cigarettes that marked the first phase. The 8th graders expressed a general distance to the vaping phenomenon, and presented the object primarily as a smoking-cessation tool for adults. Few had tried vaping, and few reported detailed knowledge. The ones with insight expressed some curiosity, and associated the social meaning of e-cigarettes in the hands of adolescents with novelty, appealing flavours,

transgression and opposition.

Vaping in focus: Performance, experimentation and social status

A second phase emerged at T2, as the now 14-15 year old interviewees had entered 10th grade and become the oldest pupils in middle school. The two years that had passed had not only caused a visible physical transformation, the interviewees had also matured in their way of speaking. Somewhere along the move towards increased status in the school hierarchy, a transition from perceptions of, to experience with, e-cigarettes had occurred for many. One-third now reported having used vaping devices themselves.

Arvid expressed it in a typical manner: “*I think most have tried them, especially my friends*” (Arvid T2.W1). Vaping seemed especially to appeal to boys, but not just boys, as Jorunn specifically pointed out: “*Most have tried them, even many of the girls*” (Jorunn T2.N1). Hence, the connections between the human and nonhuman objects had now strengthened (Latour, 2005).

The increased focus was also evident in terms of where they were used, such as Kjersti and Stian stating: “*Many have used them on the school bus*” (Kjersti T2.N2), and: “*We used them on this school trip, in our rooms*” (Stian T2.E2). Such observations were associated with an evolving IR (Collins, 2004), but also pointed to the agency of vaping devices, in that, compared to conventional cigarettes, they seemed to open up alternative spaces for use. Moreover, Marit talked about how e-cigarettes were passed around in social settings and, addressing her own experience, she said, “*I just tried it from my friend, I don't have my own*” (Marit T2.W2). By pointing to how these products were easy to share, Marit highlighted another aspect of the e-cigarettes’ inscriptions (Latour, 2005) in that they were not perceived as exclusively personal, rather they emerged as membership symbols in a social practice (Collins, 2004).

Importantly, the vaping practice was typically presented in the form of: “*I have tried them, but just like one puff of an e-cig without nicotine*” (Egil T2.W1). The participants generally described experimentation, motivated by an urge to ‘give it a try’, echoing previous findings of use among young people (Hardcastle et al., 2014). Similarly to Egil, Steffen said: “*It's without nicotine, for me that's the whole point of e-cigarettes*” (Steffen T2.N1). Overall, few described a steady user pattern and few vaped with nicotine. On the contrary, non-nicotine-containing e-liquids and vaporizers were presented as part of the attraction.

Interlinked with their preference for non-nicotine vaping, conventional cigarettes held low status among the interviewees. Several applied symbolic boundaries, by describing their use of vaping devices as “something else” than smoking:

No one uses e-cigarettes to quit smoking, it's just to do tricks and have fun (Dennis T2.W1).

Dennis’ quote is representative, as no-one in the sample reported addiction or substitution as a motive for using e-cigarettes. Moreover, Aksel expressed it like this:

E-cigarettes are much more common than normal cigarettes for people our age (Aksel T2.W1).

Many justified their experimentation by pointing to the perceived lack of health hazards. As Steinar stated: “*It's exciting and at the same time it doesn't seem dangerous*” (Steinar T2.E2). The way the interviewees described their vaping as ‘not containing nicotine’, not in the form of established and regular user patterns, and not in order to substitute smoking, distinguished the vaping practice of the young interviewees from how they presented vaping among adults in the first phase. These accounts of using e-cigarettes as a product in its own right, rather than for nicotine, also point to e-cigarettes’ weak inscriptions (Latour, 1987) and a translation of the technical invention (Latour, 2004, p. 33), as their perceptions break with those of the original conception of e-cigarettes as a smoking substitute.

Awareness of the technology part of the device and appeal in terms

of flavours were also more present:

I have one which looks like a big pen with a tank where you can refill the liquid, most often vanilla, and then you just push the button and vape. (Roald T2.N1)

Roald was attentive to the technological and visible features of his vape pen. Echoing previous findings (Measham et al., 2016), the interviewees with lived experience, similarly to Roald, also expressed clear preferences for sweet or fruity flavours, such as peach, tutti-frutti, apple, grape, strawberry, vanilla and Red Bull.

The increased focus on vaping was also demonstrated when the participants talked about user motives, in these terms: “*It’s fun and it’s the flavours*” (Anikken T2.W2), “*I use it to make rings*” (Bjarte T2.N2) and “*It’s like a hobby*” (Sturla T2.W1).

In line with Anikken, Bjarte and Sturla, the interviewees typically related the experimentation to curiosity and performance, by highlighting how the devices enabled them to act and engage in a practice. However, the greatest focus of attention seemed to be on the ritual preparation (Collins, 2004, p. 319) of vaping more than on the vaping itself (Yule & Tinson, 2017). Johannes explained:

I do tricks. You have all that vapour that allows you to do tricks, for example with your tongue. There is this trick called the tornado. You blow all the smoke down, and then you do like this [illustrates with his hands and his mouth] and two lines come up, and you make rings, that’s why I do it, not in order to vape, but because it’s cool to do tricks (Johannes T2.W2).

In the above excerpt, the agency of the e-cigarette (Latour, 2005) is visible as Johannes states that ‘the vapour allows him to do tricks’. There is, however, also an IR aspect in Johannes’ perceptions of the ‘cool’ play and performance features of vaping, evident in the way he expressed subcultural argot and displayed vape competence by describing the ‘tornado’ trick.

The IR aspect of vaping was also evident in the way adolescents translated a symbolic and social dimension of coolness to the practice of vaping in the second phase. Mats addressed this explicitly: “*Most of the young people who vape, do it in order to appear cool*” (Mats T2.W2). The cool connotation was often interlinked with performance: “*I think it looks cool, with the possibility to do tricks, those rings for example*” (Snorre T2.E2).

Descriptions of vaping as ‘cool’ highlighted the increased status and ritual aspects of the practise, as “*rituals do honour to what is socially valued*” (Collins, 2004, p. 25). In addition to the performance part of vaping, the status was related to novelty, typically in the form: “*It’s new; it provides status to try new things*” (Aase T2.E2).

The 14-15 year olds also associated the increased status of vaping with vape influencers on YouTube and Instagram.

You see those people online, crazy people, who make all these vape tricks, it’s cool to watch (Sturla T2.W1).

Sturla talked about how he enjoyed watching vape performances on YouTube. Regardless of their own experience, the majority reported having watched e-cigarette tutorials or videos of vapers performing tricks on SNS. Hence, SNS also involved exposure to vaping for the majority who had not used e-cigarettes themselves. Vaping on SNS was however not solely reserved for pro-vapers:

Many people share videos of themselves performing vape tricks, blowing rings and stuff. I see it on Instagram and My Stories all the time. It’s very like; “I vape, that’s cool” sort of (Ida T2.W2).

In line with Ida’s observations of vape content from peers on SNS, several described sharing their own vape videos and pictures. The practice of adolescents distributing content of themselves vaping on SNS emerged as a self-presentation strategy that most perceived as socially rewarding. Moreover, it demonstrated how drawing on ANT

and IR helped identify drivers for use, as the e-cigarettes weaved in and interacted in peer networks and SNS (Latour, 2005, p. 68), while the IR dimension was present in the increased focus (Collins, 2004) and the performance vaping in this phase.

In summary, vaping among the 14-15 year olds emerged as an activity one third of the sample played with for its performance, status and flavour aspects. In addition to talking about the amusing possibilities of learning new tricks, e-cigarettes in the overall sample seemingly held a position as something new – but not too harmful; transgressive – but not too boundary breaking.

“Unpopular and childish”: Processes of devaluation

A third phase became evident at T3. The now 15-16 year old participants were about to graduate from middle school. Many reported being tired of their present school setting, reading for exams, paralleled with strong expectations of the coming transition to high school. Interestingly, in the nine months that had passed since T2, they also seemed to have grown tired of e-cigarettes.

E-cigarettes? They were popular a year ago but I rarely see them anymore (Jetty T3.N2).

As expressed by Jetty, processes of devaluation of e-cigarettes marked the interviews. Jorunn stated similarly:

Before Christmas there were many who vaped. I guess they used them to get status, to appear cool and like they did not care. Now it seems like no one uses e-cigarettes (Jorunn T3.N2).

From the interviewees’ accounts of vaping as cool and transgressive, e-cigarettes had undergone a symbolic turnaround, and were now predominantly described as ‘pointless’ or ‘childish’. Ulf talked about the change in perceptions in a representative way:

I had one of those cheap shitty ones without nicotine, but I don’t see the point, really, it was supposed to be cool because of all the vapour, but seriously, no one uses e-cigarettes anymore, except perhaps for some younger ones (Ulf T3.N2).

Ulf described his e-cigarette as a low quality product, which in ANT terms, no longer acted on him (Latour, 2005), although he did not rule out that younger adolescents still used these devices. Ulf lived in North Norway. His perception of the devalued status of e-cigarettes was, however, part of a collective shift in focus (Collins, 2004) echoed in the wider sample, regardless of gender, personal experiences and geographical location. Lea talked about the shift in focus using the word ‘hype’:

At one point everyone was supposed to do it, but then it just disappeared, like a hype that passed (Lea T3.N2).

Dina echoed it by describing the use of e-cigarettes as a passing trend:

Now I look at vaping as if it’s untrendy. It was a trend, you know, everybody did it, but not anymore (Dina T3.W2).

The shared and radical change in status seemed connected to the same entangled dimensions of technology and collective mechanisms that first made e-cigarettes appealing, namely the novelty. Earlier the interviewees had connected a certain status to e-cigarettes as the new gadget, and of users being “in the know” (Thornton, 1997) through possessing or using e-cigarettes. However, when status is linked to the novelty of the product, as well as to older peers, the product’s appeal can fade as the product becomes established and they come of age. This mechanism seemed to affect the perceptions and meaning-making of e-cigarettes in the sample. By way of illustration, Arvid talked about e-cigarettes in a manner that connoted an old toy:

It was a thing you used to play with, but then it just became boring (Arvid T3.W1).

In general, e-cigarettes were now denoted as something they had grown tired of – similar to the fast fading glory of new toys. It was evident that the intriguing aspect of e-cigarettes had been related to the translations made possible by these products' weak inscriptions (Latour, 1987); the options of customization, flavours and playfulness. However, the devaluation seemed connected to social dimensions. When Nova discussed the diminished status of vaping, she included SNS:

It was a trend a year ago, when everybody was supposed to have an e-cigarette and take pictures with it to appear cool, but now it has just flattened out (Nova T3.N2).

Vaping's presence on SNS hence emerged as important for their shared understanding. Several described the fall in popularity as being linked with vaping's reduced presence in their social media feeds:

Vaping has become unpopular this year [2018] – it was popular in 2017. Then it was this huge thing, now there is no fuss about it and it's not all over social media anymore (Ida T3.W2).

When asked to elaborate, Ida explained the devaluation process like this:

People got tired. It is always fun in the beginning to try new stuff, and in this case, new ways of blowing smoke, trying new flavours and such. It's like when you get a new phone, it's cool in the beginning, but then it's soon just an ordinary phone. I think it's the same with e-cigarettes, you put them away and forget them.

Vaping was denoted a temporal practice now belonging to the past. Ida pointed to how vaping had gone through various stages in a hype cycle, initially triggered by novelty and social status. Such plasticity of vaping among young people has been identified in other studies (McKeganey, Barnard, & Russell, 2018). Moreover, vaping was commonly reserved for younger adolescents or peers described as 'outsiders':

I feel that they are unsocial, it just like a small gang sitting in their room and vaping for themselves. They are excluded from other people (Anja T3.W2).

Anja described the ones who still vaped in an unflattering manner, highlighting how perceptions of the ritual boundaries of vaping had shifted from that of a valued IR to being perceived as an exclusionary practice reserved for the out-group. Mats echoed this:

Those using e-cigs? It's the douchebags, those who think they are cool, but who everyone knows are the lame ones (Mats T3.W2).

Mats' quote points to how continued use of vaping at this time inflicted damage on users' social self (Collins, 2004, p. 32) and illustrates the importance of peer-impact on adolescents' vaping.

Vaping and "fidget-spinners"

The story of e-cigarettes as out-of-date was collectively confirmed when our participants were interviewed again at T4. They were now 16-17 years old and in high school; many reported increased autonomy in that they were treated as more mature in the school setting, and had less strict rules at home. In addition, many had started experimenting with alcohol and sometimes the occasional party cigarette. Echoing the T3 findings, vaping, however, was primarily talked about in retrospect.

I don't think it's cool. I don't know anyone my age who vapes anymore, even though it used to be popular. It was a middle-school thing. A trend, like the fidget spinner. Those are not trendy anymore either, it just dies out (Gaute T4.W1).

Gaute talked illustratively about the temporality of vaping, by pointing to how the symbolic meaning of vaping had turned from trendy to uncool. Gaute included both age and period (Suzuki, 2012) as important translators in this devaluation context. The way Gaute

compared vaporizers with out-of-fashion fidget spinners illustrated the continued weak connections (Latour, 2005) between e-cigarettes and the participants. Brita contributed additional information through retrospective reflections:

Back when we were in middle school, many brought their e-cigarettes into the classroom. I think it was mostly for fun – they used them for the vapour and flavours, but without nicotine. I feel that is something you do when you are younger, because it's the first thing you test because it is not perceived to be as dangerous as other things. But then you stop, at least if you were born in 04 like me (Brita T4.W1).

Brita similarly addressed temporality in describing how e-cigarettes had been a way to test and push boundaries in a controlled manner, for herself and her peers in middle school. She also implied that younger pupils still could find value in vaping, based on the same transgressive mechanisms. Erlend equally emphasised age as an important contextual dimension, as he differentiated between older and younger adolescents when asked about use of e-cigarettes:

The thing with vaping is that it's such an 8th grade thing to do. Lots of 8th graders buy them, believing it to be cool, however if you vape in high school people will tell you that it's so childish (Erlend T4.W1).

Like Brita, Erlend still connected a symbolic meaning of transgression to the vaping ritual for young adolescents, while labelling it as unappealing for young people of his age. Peers emerge as drivers in the devaluation process, in line with Collins' assertion that rituals generate situational ranking, between the popular and the unpopular, between the cool and the uncool (2004, pp. 337-8). In their rejection of vaping, the interviewees seemed to position themselves apart from the unpopular or 'less mature' adolescents:

That's the thing with e-cigarettes, you know, it passes. It's a thing for middle school pupils and older folks who quit smoking, not for us in high school (Kjetil T4.W2).

Kjetil's quote indirectly points to how the focus on vaping had changed in the transitional phase of adolescence (Forehand & Wierson, 1993). Moreover, the stories of how the vaping practice had faded away in this third phase denoted a 'failed ritual', deemed by Collins (2004 p. 50) as practices with a "low level of collective effervescence".

In summary, the 15-17 year old interviewees established vaping as an activity of the past. Vaping had gone from a symbol of social inclusion to one of social exclusion, whereby the interviewees, including the vast majority of those with personal experience thereof, distanced themselves from both e-cigarettes and the practice of vaping, labelling them as childish and unpopular. Their comparisons of e-cigarettes with trendy toy-gadgets like fidget-spinners highlighted both the translation and the agency of e-cigarettes in adolescent networks, but in the sense of how these devices had stopped acting on them.

Discussion

This study is the first extensive qualitative, longitudinal study of adolescents' user transitions and perceptions of e-cigarettes and vaping in a restricted regulatory context. The study contributes to the understanding of the evolving meaning of vaping devices and usage among adolescents. The longitudinal design illuminates changes in the inscription of 'e-cigarettes', first as novel objects, which act within a network with their own independent meaning regardless of the original conception, then as discarded 'old toys'. The study also identifies the social processes that shape perceptions and experiences of vaping in adolescence, such as transitions in age, positioning among peers and SNS. And importantly, how these changes interlink with variations in adolescents' vaping perceptions and practices over time. The

development can be distinguished in three phases; first, e-cigarettes were perceived as novel and transgressive. Second, e-cigarettes and vaping held status as appealing, harmless and cool, intertwined with increased use and performance vaping. In the final phase, the vaping devices no longer acted on them, and vaping was devalued and coined as childish. In summary, e-cigarettes and vaping are identified as a time-limited trend rather than steady user patterns and a successful IR in the sample.

Fluidity and experimentation

A backdrop for the study was the restrictive Norwegian context and the growing public health concern over young people's vaping internationally (Gilreath et al., 2016). In the current study, rather than signs of nicotine-addicted use, as observed in the US (Cullen et al., 2019), a low-intensity and temporal vaping pattern marked by fluidity and experimentation is witnessed. The evolving meaning of vaping devices and usage in the sample constitute use which, on the one hand, is motivated by non-nicotine devices, lack of addiction, and perceived harmlessness, and, on the other, by status, play and performance. Such fluid and gradually changing vaping patterns are also found in studies using a longitudinal design in other regulatory contexts, such as the US study by Hair and colleagues (2019) and in the small UK case-study by McKeganey and Barnard (2018).

The first phase includes a general distance to the vaping phenomenon. The 12-13 year olds primarily deem e-cigarettes as smoking cessation-tools reserved for adults, whilst a minority express curiosity related to the products' novelty and flavours. They also attach a social meaning of maturity, transgression and opposition to young people's vaping, corresponding with the insights of Yule and Tinson (2017), while also echoing meanings previously identified with young people's smoking (Turbin, Jessor, & Costa, 2017). Moreover, the minority of curious adolescents emphasise the appeal of flavours, echoing previous findings of young people's vaping motivated by varieties of flavours (Measham et al., 2016; Park, Kwon, Gaughan, Livingston, & Chang, 2019).

The second phase involves an increase in lived experience among the now 14-15 year olds, as well as general accounts of vaping as popular and vaping devices as appealing, in line with the findings of Hardcastle and colleagues (2014). The novelty and flavours are still present, but in addition performance and status are key aspects, matching the findings of Measham and colleagues (2016). Non-nicotine-containing e-liquids and vaporizers are part of the attraction, perhaps as a way of indicating that these vaping products were not dangerously acting objects (Latour, 2005) leading to addiction, as they rather seem to delegate more innocent and beneficial actions to them. Vaping's appeal is rather connected to the amusing possibilities of learning new tricks, and seemingly partaking in a ritual allowing them to transgress with limited risk.

The third phase represents a symbolic turnaround, as the 15-17 year olds deem vaping to be an irrelevant practice, and hence a 'failed ritual' (Collins, 2004). The former attractions attached to the vaping devices (novelty, status, transgression) are no longer evident, rather distance is apparent in the way they label devices and usage as childish and unpopular. From an ANT perspective, these devices no longer act on them, as the practices they enabled are dismissed (Latour, 2004, p. 45). Rather they are resorting to an external force (unpopular toys) that has little in common with the original translation or 'purpose' of the object (Latour, 2004, p. 38).

Similar fluid and gradually changing vaping patterns are identified in a US study (Hair et al., 2019) and a small UK case-study (McKeganey & Barnard, 2018), despite different regulatory contexts. Moreover, McKeganey and Barnard (2018) suggested that the development in perceptions among peer group members was one possible explanation of why adolescents' perceptions of vaping can rapidly shift. The fluidity may hence indicate that diffusion processes, both in and out of vaping,

can be affected by the regulatory context to a certain degree, but also unfold outside the control of policymakers. Advertising bans seem, for example, to be challenged by online content. Across the sample, the adolescents in our study reported SNS to be an important information source, both for their initial curiosity, in line with Park and colleagues' findings (2019), and for the continuous collective process of negotiating the meaning of vaping. The performance aspect of vaping mimicked by some interviewees in middle school was, for instance, associated with SNS influencers. Especially at T2, experience, displayed by 'cloud chasing' and performing tricks (Measham et al., 2016; Tokle & Pedersen, 2019) interlinked with status, inclusion and competence, highlighting SNS as an important socio-spatial context of vaping.

The social mechanism at play can also be related to adolescence as a transformative, social context (Forehand & Wierson, 1993), and age as an important driver for change (Suzuki, 2012), evident in the way the participants first connoted vaping with older, tougher peers or adults, then as they devalued vaping as 'childish'. Moreover, the increased knowledge and prevalence of vaping at T2 may be age-related, since curiosity, reward-seeking behaviour and wanting to be "in the know" (Thornton, 1997) have a special place in middle school (Steinberg, 2010).

Actor-Network and Interaction Ritual

In line with the logic of ANT, the study also identifies the importance of nonhuman actants for human practices (Latour, 2005). The adolescents in our sample adapted a technology designed to aid smoking cessation, and altered its meaning in their social context. Latour (2004, p. 234) noted how the effect of an actant depends on its use, as "not all rocks are the same". Latour outlined how objects which, on a broad scale, can be labelled the same, still act differently on us – a stone on a ring versus a stone in the shoe. This can be transferred to the interviewees' descriptions of vaping devices. The participants with personal experience primarily described vaping non-nicotine liquid from low quality e-cigarettes. None reported use of nicotine-containing pod-versions like JUULs as found popular in the US (Hajek et al., 2020). Hence, the decreased interest could be related to their choice – or availability of 'rocks'. Moreover, they assigned a new meaning to these products, presenting them as toys, in contrast to the original inscription of the e-cigarette as a smoking cessation tool (Hajek et al., 2014). In this translation (Latour, 1987; 1994), the adolescents created their own vaping rituals (Measham et al., 2016). Hence, the participants highlight the independent symbolic meaning of e-cigarettes for young people relative to their original purpose (Pokhrel, Herzog, Muranaka, & Fagan, 2015), as a marker of transgression, status and finally stigma. Moreover, Latour (2005, p. 39) wrote: "No matter how apparently simple a mediator might look, it may become complex; it may lead in multiple directions which will modify all the contradictory accounts attributed to its role". Such shifting directions is evident in the way e-cigarettes were given agency in the second phase, 'allowing' the actors to perform tricks and present themselves. Then, as they were disconnected from the human actors in the third phase, and discarded as old phones and unfashionable fidget-spinners. Hence, the e-cigarettes interact with the adolescents not only in their vaping practices, but also integrate into a larger network of consumer practices.

Collins (2004) meets Latour (1994; 2005) in his conceptions of the importance of material resources in social practices. The interviewees did not perceive e-cigarettes as particularly personal objects, rather they described the social aspects of how they were passed around, implying a low-intensity IR taking place (Yule & Tinson, 2017). Collins (2004) describes the relationship between the material market and IR as feedback loops; each is a necessary input into the other. In correspondence with Yule & Tinson's (2017) findings, the social sides of vaping are also driven by the processes of IR. For instance, having an e-cigarette in the initial phases was associated with positive attention, as vaping represented novelty and transgression. Hence, the vaping ritual

could socially include the ones who 'dared' to try. However, the successful IR (Collins, 2004) side to vaping simultaneously disappeared as the focus and meaning of vaping in the sample shifted.

The study adds to the literature on vapers as a heterogenous group vaping for various reasons (see e.g. Farrimond, 2017; Tokle & Pedersen, 2019), suggesting a need for targeted public health messages. Preventing vaping among young people implies a policy of altering the translations, to use Latour's (1994) terminology. This could involve implementing regulations that prevent access to low-cost vaporizers and appealing flavours online and maintaining restrictions on products with high likability such as JUULs in this age group. Importantly, the fluidity of adolescent's perceptions and vaping practices emerged as largely influenced by their shifting focus in peer networks and SNS. Hence, the important connection between symbolic meaning and use seems largely to be governed within the adolescent population itself.

Conclusion

In this study I have found evidence that e-cigarettes or vaping devices can represent fashionable experimentation rather than steady user patterns. Overall, these findings add to the existing literature on vaping in adolescence by acknowledging both the importance of the innovative features of vaping devices, and the evolving symbolic meaning of vaping in peer groups for usage in adolescence.

Declaration of Competing Interest

The author declares no conflicts of interest.

Acknowledgements

This project (2015/FO5245) has been funded by the Dam Foundation. I would like to thank Janne Scheffels and Kristin Buvik at NIPH for their valuable support and helpful comments. I am also grateful to the editor and the anonymous reviewers whose suggestions improved the article from the first draft. Dam Foundation (earlier called Extra stiftelsen) have 38 members, all voluntary health and rehabilitation organisations based in Norway. The foundation support free research and receives part of the profit the national lottery in Norway, Norsk Tipping.

References

- ASH (2019). "Fact sheet: Use of e-cigarettes among young people in Great Britain". June 2019. URL: <http://ash.org.uk/wp-content/uploads/2019/06/ASH-Factsheet-Youth-E-cigarette-Use-2019.pdf>. Retrieved: 20 June 2019.
- Brunborg, G. S., Scheffels, J., Tokle, R., Buvik, K., Kvaavik, E., & Burdzovic Andreas, J. (2019). Monitoring young lifestyles (MyLife) – a prospective longitudinal quantitative and qualitative study of youth development and substance use in Norway. *BMJ Open*, 9(10), e031084.
- Callon, M., & Latour, B. (1981). Unscrewing the big Leviathan: How actors macro-structure reality and how sociologists help them to do so (Eds) In K. Knorr-Cetina, & A. V. Cicourel (Eds.). *Advances in social theory and methodology: Toward an integration of micro- and macrosociologies* (pp. 277–303). Boston, London and Henley: Routledge & Kegan Paul.
- Chapman, S. L. C., & Wu, L.-T. (2014). E-cigarette prevalence and correlates of use among adolescents versus adults: A review and comparison. *Journal of Psychiatric Research*, 54, 43–54.
- Collins, R. (2004). *Interaction Ritual Chains*. Princeton: Princeton University Press.
- ... & Cullen, K. A., Gentzke, A. S., Sawdey, M. D., Chang, J. T., Anic, G. M., Wang, T. W., & King, B. A. (2019). E-Cigarette use among youth in the United States, 2019. *JAMA*, 322(21), 2095–2103.
- Erku, D. A., Kisely, S., Morphet, K., Steadman, K. J., & Gartner, C. E. (2020). Framing and scientific uncertainty in nicotine vaping product regulation: An examination of competing narratives among health and medical organisations in the UK, Australia and New Zealand. *International Journal of Drug Policy*, 78, 102699.
- Etter, J. (2016). Characteristics of users and usage of different types of electronic cigarettes: Findings from an online survey. *Addiction*, 111(4), 724–733.
- Evans-Polce, R. J., Patrick, M. E., Lanza, S. T., Miech, R. A., O'Malley, P. M., & Johnston, L. D. (2018). Reasons for vaping among US 12th graders. *Journal of Adolescent Health*, 62(4), 457–462.
- Farrall, S., Hunter, B., Sharpe, G., & Calverley, A. (2015). What 'works' when retracing sample members in a qualitative longitudinal study. *International Journal of Social Research Methodology*, 19(3), 287–300.
- Farrimond, H. (2017). A typology of vaping: Identifying differing beliefs, motivations for use, identity and political interest amongst e-cigarette users. *International Journal of Drug Policy*, 48, 81–90.
- Forehand, R., & Wierson, M. (1993). The role of developmental factors in planning behavioral interventions for children: Disruptive behavior as an example. *Behavior Therapy*, 24(1), 117–141.
- ... Gilreath, T. D., Leventhal, A., Barrington-Trimis, J. L., Unger, J. B., Cruz, T. B., Berhane, K., & McConnell, R. (2016). Patterns of alternative tobacco product use: Emergence of hookah and e-cigarettes as preferred products amongst youth. *Journal of Adolescent Health*, 58(2), 181–185.
- Goniewicz, M. L., Hajek, P., & McRobbie, H. (2014). Nicotine content of electronic cigarettes, its release in vapour and its consistency across batches: Regulatory implications. *Addiction*, 109(3), 500–507.
- Hair, E. C., Romberg, A. R., Niaura, R., Abrams, ... Vallone, D. (2019). Longitudinal tobacco use transitions among adolescents and young adults: 2014-2016. *Nicotine and Tobacco Research*, 21(4), 458–468.
- Hajek, P., Etter, J. F., Benowitz, N., Eissenberg, T., & McRobbie, H. (2014). Electronic cigarettes: Review of use, content, safety, effects on smokers and potential for harm and benefit. *Addiction*, 109(11), 1801–1810.
- Hajek, P., Pittaccio, K., Pesola, F., Smith, Myers, Phillips-Waller, A., K., & Przulj, D. (2020). Nicotine delivery and users' reactions to Juul compared with cigarettes and other e-cigarette products. *Addiction*. <https://doi.org/10.1111/add.14936>.
- Hardcastle, K., Hughes, K., Worsley, J., Bennett, A., Ireland, R., & Sweeney, S. (2014). "Most people I know have got one": Young people's perceptions and experiences of electronic cigarettes. *Liverpool: Centre for Public Health, Liverpool John Moores University*.
- ... Huang, J., Duan, Z., Kwok, J., Binns, S., & Emery, S. L. (2019). Vaping versus JUULing: How the extraordinary growth and marketing of JUUL transformed the US retail e-cigarette market. *Tobacco Control*, 28(2), 146–151.
- Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Cambridge, Mass.: Harvard University Press.
- Latour, B. (1994). On technical mediation. *Common Knowledge*, 3(2), 29–64.
- Latour, B. (2004). Why has critique run out of steam? From matters of fact to matters of concern. *Critical Inquiry*, 30(2), 225–248.
- Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory*. Oxford/New York: Oxford University Press.
- Lundberg, C. S., Kvaavik, E., & Tokle, R. (2019). Nye bruksmønstre i et tobakkmarked i ending-kombinert bruk av sigaretter, snus og e-sigaretter blant ungdom. *Nordic Studies on Alcohol and Drugs*, 36(1), 6–20.
- McKeganey, N., & Barnard, M. (2018). Change and continuity in vaping and smoking by young people: A qualitative case study of a friendship group. *International Journal of Environmental Research and Public Health*, 15(5), 1008.
- McKeganey, N., Barnard, M., & Russell, C. (2018). Vapers and vaping: E-cigarettes users views of vaping and smoking. *Drugs: Education, Prevention and Policy*, 25(1), 13–20.
- McNeill, A., Gravelly, S., Hitchman, S. C., Bauld, L., Hammond, D., & Hartmann-Boyce, J. (2017). Tobacco packaging design for reducing tobacco use. *Cochrane Database of Systematic Reviews*(4).
- Measham, F., O'Brien, K., & Turnbull, G. (2016). "Skittles & Red Bull is my favourite flavour": E-cigarettes, smoking, vaping and the changing landscape of nicotine consumption amongst British teenagers—implications for the normalisation debate. *Drugs: Education, Prevention and Policy*, 23(3), 224–237.
- Miech, R., Patrick, M. E., O'Malley, P. M., & Johnston, L. D. (2017). What are kids vaping? Results from a national survey of US adolescents. *Tobacco Control*, 26(4), 386–391.
- Park, E., Kwon, M., Gaughan, M. R., Livingston, J. A., & Chang, Y.-P. (2019). Listening to adolescents: Their perceptions and information sources about e-cigarettes. *Journal of Pediatric Nursing*, 48, 82–91.
- Pokhrel, P., Herzog, T. A., Muranaka, N., & Fagan, P. (2015). Young adult e-cigarette users' reasons for liking and not liking e-cigarettes: A qualitative study. *Psychology & Health*, 30(12), 1450–1469.
- Steinberg, L. (2010). A dual systems model of adolescent risk-taking. *Developmental Psychobiology: The Journal of the International Society for Developmental Psychobiology*, 52(3), 216–224.
- Suzuki, E. (2012). Time changes, so do people. *Social Science and Medicine*, 75(3), 452–456.
- Thornton, S. (1997). The social logic of subcultural capital (Eds.) In K. Gelder, & S. Thornton (Eds.). *The subcultures reader* (pp. 184–192). London: Routledge.
- Tokle, R., & Pedersen, W. (2019). "Cloud chasers" and "substitutes": e-cigarettes, vaping subcultures and vaper identities. *Sociology of Health & Illness*, 41(5), 917–932.
- Turbin, M. S., Jessor, R., & Costa, F. M. (2017). Explaining smoking behavior in adolescence. In R. Jessor (Ed.). *Problem behavior theory and adolescent health* (pp. 353–367). Cham: Springer.
- Vartanian, L. R. (2000). Revisiting the imaginary audience and personal fable constructs of adolescent egocentrism: A conceptual review. *Adolescence*, 35(140), 639–662.
- Vedoy, T. F. (2015). Hvor mange begynder og hvor mange slutter med tobakk hvert år? *Estimer fra tverrsnittundersøkelser 2005-2014*. URL: <http://hdl.handle.net/11250/2432102>.
- Vedoy, T. F., & Lund, K. E. (2017). Selvrapporterte forsyningskilder for sigaretter, snus og e-sigaretter. *Tidsskrift for den Norske Laegeforening*, 137(16-21) <https://doi.org/10.4045/tidsskr.16.0994>.
- WHO. (2014). *Electronic nicotine delivery systems*. Retrieved from http://apps.who.int/gb/ctc/PDF/cop6/FCTC_COP6_10-en.pdf.
- Yule, J. A., & Tinson, J. S. (2017). Youth and the sociability of "Vaping". *Journal of Consumer Behaviour*, 16(1), 3–14.

