Chapter 8

Slippery slopes and Trojan horses: The construction of e-cigarettes as risky objects in public health debate

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Introduction

The availability and use of electronic, or 'e', cigarettes has grown extensively since 2012, and it is estimated that approximately 2.8 million people use them in the UK alone (ASH, 2016). Over this time shops devoted to selling e-cigarettes and cafes for e-cigarette use have sprung up across the UK, internet messaging boards and social groups have been formed through the identity of being an e-cigarette user, and new language has developed around the practices of e-cigarette use, with 'e-cigs' and 'vaping' being added to the Oxford Online Dictionary in 2014. The spread and development of e-cigarettes is being undertaken both by big tobacco companies and by smaller and (at present) independent companies. Promotional material produced to market e-cigarettes differs in its emphasis. Some explicitly suggest the objects are beneficial to health as an alternative to tobacco cigarettes, whereas other advertisements push cultural appeals, promoting these objects as 'cool' or glamorous, or emphasising the ability to 'vape' in a range of places where smoking would not be permitted.

This growth has attracted the attention of those working in public health, who have sought to predict what the impact of these new objects might be on the health and behaviour of the population. This has typically involved comparison of e-cigarettes with tobacco cigarettes, an association which raises the stakes for assessing their impact. The reduction of tobacco cigarette use through the introduction of higher taxes and bans on advertising, selling, and places where tobacco smoking is permitted has been seen as a success story in public health. These measures have been viewed as resulting in tobacco smoking becoming

'denormalised' (Bell et al, 2010), leading to a general cultural shift where smoking is no longer part of usual acceptable behaviour.[1] In other words, public health interventions have succeeded in stigmatising smoking (Bell et al, 2010). Despite this shift, however, there remains a concern that denormalisation does not aid those 'addicted' to tobacco, nor prevent groups of potential new smokers (usually seen as children and adolescents) from taking up tobacco (Hsu et al, 2013). How e-cigarettes may add to, or detract from, previous successes in combating tobacco use and these enduring concerns is therefore of high interest and importance to public health scientists.

Like other concerns of public health, debates on e-cigarette use revolve around the management of risk and future risk. As a new technology, debates around e-cigarettes have had to start without much evidence as to their use and impact, and to what extent these objects are themselves 'risky'. Despite this, or perhaps because of this, opinion in public health has fallen into two camps: those in favour of e-cigarettes, who view them as medical devices or treatments (e.g. Britton and Bogdanovica, 2014; Etter, 2014; McNeill et al, 2015; Hajek, 2013; Stimson, 2014), and those who are against them, viewing them as potentially harmful (e.g. Abrams, 2013; de Andrade; Chapman, 2013, 2014; Fairchild et al, 2014; Hsu et al, 2013; McKee and Capewell, 2015). Those who are positive about such technology suggest that these are the most useful smoking cessation aids yet - a personal medical device providing a safe delivery mechanism for nicotine which can be used by a person as they would a cigarette. For those who are against e-cigarettes, these are potentially harmful objects, whose sale and use give a legitimate public presence to cigarette-like objects and to smoking-like behaviour. This, it is feared, will undo 'decades of work' by 're-normalising' smoking and encouraging people to continue, or to start, to smoke (Hsu et al, 2013). One side of the debate therefore believes that the impact of e-cigarettes will be that that less people will smoke tobacco, whilst the other fears that more people will do so.

This chapter examines the ways in which biomedicine, in this case public health science, has sought to understand and locate e-cigarettes as a new development which may, or may not, be a personal medical device (PMD). While earlier book chapters considered the personal relationships of individual users to PMDs, this chapter looks at the impact and positioning of a particular PMD within a wider area of concern - how medical research conceptualises e-cigarettes in relation their impact on health. As Jeanette Pols notes of the introduction of telecare, innovative technologies can see individuals rushing to declare both the positives and negatives of new devices and the impact they will have (2012). Pols makes the point, however, that new technologies can do new and unexpected things in practice, with people using these in unpredictable ways. She cites the example of the telephone becoming popular as it was used to facilitate 'the social chatter of American women, even if its designers created it to transmit the business conversations of American men' (2012, p.18). Through her own study it becomes clear that the telecare devices at the centre of her research - predicted to reduce professionals' workload through less contact with patients, creating care devoid of human contact - instead *increased* contact between carers and patients. These new technologies did not emerge as being cold, rational and functional in opposition to warm, comforting, human care as was initially suggested (Pols, 2012). As Pols states of telecare, arguments about supposed impacts may be less of a *debate* and more *juxtapositions,* which contest '"inevitable" futures' (2012, p12). Indeed the two sides in the e-cigarette debate have become completely polarized, resulting in mud-slinging and divisions.

Such impassioned arguments reveal an emotional element officially banished from scientific positioning, which otherwise claims to rely on cold, hard evidence. This evidence base has often relied on randomised controlled trials (RCTs), which, Pols suggests, discipline an individual's personal and subjective knowledge. These put 'objective' knowledge in place

as evidence to demonstrate the effectiveness of an intervention, leaving no (official) place for subjective positioning (Pols, 2012, p138). However, robust RCTs take time to carry out, and the field of new technologies is fast-developing. By the time a trial has been funded and set up, the intervention technology may have moved on. An example of this can be seen in the Get Moving trial, which aimed to increase physical activity through the use of self-monitoring wristbands providing feedback data about individual activity (Cooper et al, 2015). While this was cutting edge technology at the time of the development of the trial, by the time the trial was funded and undertaken sleeker commercial products allowing more sophisticated interaction with data (such as the Nike Fuel band and downloadable smartphone apps) had been developed, made the trial technology appear embarrassingly ugly, old and clunky (Lynch and Cohn, 2015).

As well as the problems with trialling technologies that have already been superseded or made redundant by the time the trial results are published, such trials are limited in their ability to pick up nuanced aspects of the use of novel technologies, such as the new places, practices and components that accompany these, as well as changes over time and in different contexts. Even as an evidence-base of the impact of e-cigarettes is built up, this is therefore unlikely to produce definitive results, and 'objective' evidence produced can be employed selectively and strategically, and in relation to particular audiences (Ecks, 2008). Not only is it hard to generate evidence on the impact of e-cigarettes, but it is also unlikely the called-for research trials will reconcile the stances in this debate. This can be seen in responses to publications on e-cigarette use, such as the report published by Public Health England (PHE), which found positive results (Public Health England, 2015; McNeill et al, 2015). This was criticised by fellow public health scientists as being:

methodologically weak, … which is made all the more perilous by the declared conflicts of interest surrounding its funding… [It] raises serious questions not only about the conclusions of the PHE report, but also about the quality of the agency's peer review process.   (McKee & Capewell, 2015).

That such arguments question the 'objective' nature of the evidence produced is no surprise given their origin in a framework which prioritises 'objectivity' of judgment. The 'objective' assessment, and associated positioning of objects within it, is of course how the scientific process deals with uncertainties. While there is substantial disagreement between the two sides of the e-cigarettes debate, both sides are eager to position these new and uncertain technologies somewhere within a particular frame of understanding - a positioning which relates to the predicted riskiness of these objects.

In his sociological examination of the science of public health, Kevin Dew argues that as chronic rather than infectious disease has become a greater concern for public health, risk factor epidemiology has taken a more central role (Dew, 2012).[2] Connecting people to individualised risk factors which make them susceptible to disease locates the source of health and illness within the individual body and individual choices and actions, or 'behaviours'. Some behaviours are seen as particularly risky to health and therefore have become foci for public health interventions. For many public health research teams there are four key 'health behaviours' - diet, alcohol use, level of physical activity and tobacco use. These can put individuals at greater or lesser risk of ill health, and particular objects and substances - sugar, alcohol, and cigarettes for example - are associated with these behaviours as risky objects. Despite this understanding, however, risks are not neutral, and there are wider consequences for framing behaviour and objects as 'risky'. Alongside conceptualisations of risk, notions of responsibility, blame and morality also emerge, so that

risky objects, and users of these objects, are also positioned positively or negatively in a moral framework. Individualistic understandings of health and personal responsibility for health fit well with the construction of risk factor epidemiology. Individual 'health behaviours', and therefore use of particular objects, are the choice (and responsibility) of individuals themselves.

Context and framing

Situated as an anthropologist in a multi-disciplinary public health research team that sought to add to the growing evidence on the impact of e-cigarettes, my argument is drawn both from participation observation within the team and from analysis of scientific papers and commentaries produced by the scientific community which were emerging on this topic between 2013-2015. Through the research meetings, discussions and email exchanges I participated in (between December 2013-September 2014) and also evident through the discourses produced more broadly within public health over this time, I observed how research scientists sought to give this new technology a value and moral positioning by placing it within a wider medical (and consequently moralising) framework. The two sides of the debate emerged and became more polarised through these discussions and over time, and this was a split we had to negotiate as researchers in interactions, collaborations, and everyday research tasks. From an anthropological perspective it also became clear that researchers on both sides were constructing e-cigarettes as particular *types* of objects which drew on similar fundamental understandings within public health. This meant that while e-cigarettes were being constructed as different objects by the two sides in the debate, these conceptualisations relied on the same understandings of objects and people, and the relationship between these.

Objects can be conceptualised as connected to, created by, and interacting with other actors such as materials, people, other objects and infrastructure in a co-constituted way (Maller, 2015, p.54), and as emerging from the context they are situated within rather than existing independently 'outside' it. Practice theorists and approaches from science and technology studies suggest that objects are created or 'enacted' through practices (Mol, 2002). Mol's work on atherosclerosis, for example, proposes that this disease, like other diseases and indeed like the body itself, is 'made' through the various practices undertaken by clinicians, surgeons, laboratory technicians and patients (Mol, 2002). Instead of taking what Law and Singleton refer to as an 'epistemological' approach - looking at one object (or one disease, in the case of atherosclerosis) seen differently by people with different perspectives on this - this is rather an 'ontological' perspective, where different enactments of an object make different objects (Law and Singleton, 2005; Mol, 2002). So the work undertaken by clinicians, surgeons, laboratory technicians and patients in the example of Mol's study *make* different atherosclerosis, and different bodies, through their different enactments. In the context of the e-cigarettes debate therefore, this approach suggests that the fundamental difference between the two sides is not merely an epistemological distinction between different perspectives on the same object, but an ontological distinction. Through their practices the two sides enact e-cigarettes in different ways, so that e-cigarettes are made as different objects that 'are' different things.

Rather than considering the growing evidence of e-cigarette use and impact, or trying to reconcile these positions, I instead wish to focus on how e-cigarettes are constructed as (different) objects in these public health debates. I look to move beyond the entrenched dichotomy of opinion by asking whether e-cigarettes might be considered different types of objects, over and beyond a medical device or a device masquerading as such. Presenting an alternative future for e-cigarettes, I suggest some limitations of the ways public health science

constructs its objects of study and how an alternative focus on objects in analysis may take us to different, and perhaps more productive, places.

E-cigarettes as types of cigarettes

For one side of the debate, e-cigarettes presented a number of potential harms. E-cigarettes might act as smoking 'cues' (2013), the increasing popularity and marketing of e-cigarettes having already resulted in an increased presence of 'cigarette-like objects, images and smoking behaviour' which may renormalise smoking (Hsu et al, 2013, p5). Others focused on the new role that e-cigarettes-as-medical-treatments allowed tobacco companies to take, becoming partners in health policy (Chapman, 2013; de Andrade, Hastings and Angus, 2013). In an impassioned opinion piece Professor of Public Health Simon Chapman suggests the promotion of e-cigarettes is of great advantage to the tobacco industry as a means to keep people smoking, 'conveying to young, apprehensive would-be smokers that nicotine is a benign drug; and welcoming back lapsed smokers' (Chapman, 2013, p3840). Suggesting that this in danger of becoming 'one of the biggest blunders of modern public health', Chapman insists that '[w]e should make none of the disastrous mistakes made with cigarettes... We should not start by assuming they are benign items of commerce' (Chapman, 2013, p3840). For those on this side of the debate, then, e-cigarettes were risky objects, not 'benign' objects - they were objects *masquerading* as personal medical devices.

Underpinning this argument is the notion that e-cigarettes are a *type* of cigarette. Through this construction, e-cigarettes are so similar to tobacco cigarettes that they are viewed as another version of the same kind of object. This common-sense argument was also seen in public reactions to e-cigarettes and in the rationale for banning their use in some public places. For example, in statements given by the British pub and bar chains J.D.

Wetherspoon and Fuller's Inns as to why e-cigarettes were banned in their establishments, the managing director of Fuller's Inns is quoted as telling a trade magazine that:

> For non-smoking customers, the sight of a customer using an e-cigarette is disconcerting, especially it's often hard to tell the difference between a tobacco cigarette and an e-cigarette from distance, which causes added anxiety for our guests.   *(The Publican's Morning Advertiser, 2013).*

As e-cigarettes so resembled tobacco cigarettes, others present might *think* or *assume* that the person was smoking tobacco, leading to some undisclosed anxiety - perhaps relating to second-hand smoke exposure, or discomfort arising from another's rule-breaking. However, this argument of 'typing' falls down in a number of areas.

Richard Klein's book on the philosophical, literary and cultural history of cigarettes (*Cigarettes Are Sublime,* 1995) suggests that tobacco cigarettes are among the most significant objects of our time and a crucial integer of modernity, with their introduction to Europe coinciding with the spread of books, the development of the scientific method and increased questioning of theological positions. Cigarettes have been objects of gift and trade, portrayed in particular ways in literature, photography and film and have provided a language of acts and gestures. As newer objects, some e-cigarettes have been marketed in similar ways to cigarettes and have started to be depicted in popular culture, featuring in film and television shows where tobacco cigarettes would not permitted, such as the film 'The Tourist' (Bell and Keane, 2012; de Andrade et al, 2013) or the popular UK soap opera 'Eastenders' (de Andrade et al, 2013). However, neither the experience of smoking tobacco cigarettes, nor the multitude of symbolic meanings attached to tobacco cigarettes, can be directly taken on by e-cigarettes. Klein notes for example that the act of smoking may be an act of defiance or

a time for meditation or composure, opening a gap of time in everyday ordinary experience. E-cigarettes do not 'take' a similar time to consume in this way, however - a cigarette break (lasting as long as a cigarette takes to smoke) is not a similarly defined time period for an e-cigarette. As well as the self-consuming nature of tobacco cigarettes, the social act of sharing a packet does not translate to e-cigarette use, and nor are the range of designs, use of technological apparatus and wide range of flavours of e-cigarettes found in tobacco cigarettes. While a logical comparison of objects independent of context may see these objects as the same, as soon as an analytic focus is moved to situating the object within smoking practices it becomes more difficult to assume that e-cigarettes and tobacco cigarettes will have the same pattern of use and associations.

Moreover, these discourses not only group e-cigarettes into a wider category of 'cigarettes' but also lump together a wide range of objects under this term. The category of 'e-cigarettes' actually incorporates a range of different products of varying types. While public health discussions often group these together, in marketing these products and in online user forums significant distinctions are made between various forms of e-cigarettes, such as 'vaporisers' or 'e-hookahs'. Terming all these products 'e-cigarettes' retains and reinforces the link to tobacco cigarettes, despite the fact that only a few of these technologies closely resemble traditional cigarettes. Instead many have obvious metal, glass and plastic components, can be bought in a range of colours, and can be modified and personalised not only in look but by flavour, chemical mix and nicotine content. By their very nature, therefore, some types of e-cigarettes can be tailored to fit the user and user requirements – they are objects that people can form, and express, a longer-term relationship with as they personalise and refuel the same piece of equipment. The technology of e-cigarettes also requires engagement and use of different smoking paraphernalia such as chargers or refills.

Again, considering these objects in context and in use moves further away from a simple comparison with tobacco cigarettes.

Inherent in the logic of this side of the argument, and again reinforcing the idea that these are the same sorts of objects as tobacco cigarettes, is the notion of the 'slippery slope' that leads individuals from one object, or substance, to another. This viewpoint suggests a single continuum of substances, with people being seen to migrate from e-cigarettes to tobacco cigarettes with relative ease. The same argument has been applied in terms of drug use, with people moving from cannabis to harder drugs along this one continuum (e.g. Kandel, 2003). This assumes an inherent vulnerability with people slipping from one object to another unproblematically, and that these objects are so similar that they are interchangeable - that cannabis is in some way the same as heroin, and that vaping an e-cigarette is the same as smoking a tobacco cigarette. From a perspective that focuses on user experiences and practices, however, this is not so smooth and inevitable a move.

The use of different drugs do not involve the same actions; they have different physiological effects and different contexts and meanings. This perspective also constructs the user as passive and lacking in will, as 'addicted' and unable to escape the power of the object or substance itself. This lack of individual will in the face of such a powerful object imbues both those smoking and the drugs themselves with a form of morality: smokers are 'weak' and drugs are 'dangerous' and 'addictive'. This implied morality around addictive objects and substances, and around addicts and addiction in general (a perspective also found in discourses on obesity, e.g. Puhl and Heuer, 2010), can be tied to broader cultural understandings of the importance of self-control and self-mastery as an indicator of civility (Bennett, 2013): we *should* be able to control and monitor ourselves in relation to these objects, and addiction is therefore a failure of will. Those who are addicted have less self-control, and are somehow deficient.

E-cigarettes as a copy of the original

For those who focus on the benefits of e-cigarettes, these are constructed as objects which could lead to the end of smoking-related disease (Hajak, 2013). From this perspective, smokers will 'switch' to e-cigarettes as 'an alternative and much safer source of nicotine, as a personal lifestyle choice' (Britton and Bogdanovica, 2014). As another public health professor, Jean-François Etter, points out, e-cigarettes do not need to be completely 'safe', only safer than tobacco cigarettes. This is about harm reduction, then, where alternative risks posed by different substances are weighed up to reduce risks to the individual, even if these are not removed completely. As Etter states: 'Even if some former smokers remain addicted to the nicotine delivered by e-cigarettes, this is not a public health problem because e-cigarettes have not been proved to be toxic. Thousands of former smokers are addicted to nicotine gum, and this is not a public health problem either' (Etter, 2013, p3845). For Etter, e-cigarettes offer a 'revolution in public health' and as many smokers should be pushed into using e-cigarettes as possible (Etter, 2013). These are therefore medical devices: they are only *appearing* to be a type of cigarette but in fact they are a *copy* of a cigarette. They are not cigarettes masquerading as medical devices but are medical devices masquerading as cigarettes. They are simulants (and stimulants of course!) - they simulate the real thing, the tobacco cigarette, mimicking this but remaining a copy.

It is in the mimetic faculty of the copy that its power lies, as the anthropologist Michael Taussig states: 'The wonder of mimesis lies in the copy drawing on the character and power of the original, to the point whereby the representation may even assume that character and that power' (1993, p.xiii). Through their mimicry of tobacco cigarettes, e-cigarettes may 'seem' to be cigarettes but actually they are quite different objects. While on the outside resembling a cigarette, they are actually delivering something else, like a Trojan

horse. Through being a convincing copy they have the potential to be subversive and useful objects in making changes to health behaviour. As a convincing simulant, this side of the argument theorises that people would find it easy to form the same relationship with a copy as they did with the original, moving away from being addicted to tobacco cigarettes to (being addicted to) e-cigarettes. Taussig's work on mimesis goes further, suggesting that not only is there a power drawn from the original in the copy, but also in the power of a copy to influence the original. He compares this to James Frazer's early anthropological understanding of sympathetic magic, or the use of powerful copies to magically affect what they are copies of (Frazer, 1890). This can be seen in practices associated with 'voodoo' or other forms of magic where a lock of hair or fingernail represents a person, so that enacting magic using these bodily parts impacts on the person who has been represented. Arguments for the benefits of e-cigarettes also draw on a sort of sympathetic magic argument in suggesting that e-cigarettes have the power to impact on tobacco cigarette use- the power of the copy affects how the original is used.

Taussig developed his work from Walter Benjamin's essay 'The Work of Art in the Age of Mechanical Reproduction' (1968 [1955]) which raises questions about reproduction and authenticity in relation to works of art. Looking at mass reproduction, Benjamin suggests that while the original piece of art is an independent object from the copy, through the act of reproduction something is taken from the original, changing its context. At the same time, the original retains something that will always be lacking from the copy. The original's 'presence in time and space', what he terms the 'aura' of a piece of work, is absent in a reproduction. As simulants, e-cigarettes draw on the power of original cigarettes in their construction and appeal, but without the aura of cigarettes, can these ever be a replacement?

The particular aura of cigarettes has been portrayed through many cultural sources including literature, photography and film, for example in well-known glamorous

photographs of Marlene Dietrich and the notion of the 'Humphrey Bogart cigarette' (Klein, 1995) from which the slang term for a cigarette as a 'bogey' also developed. Klein compares the sublimity of the tobacco cigarette to creating a poem:

> inhaling the hot breath of inspiration, letting words on a page burn up in the visible air of a muted electrocution, exhaling swirling figures of desire, conducting with gestures and modulating in smoke a lyric conversation overheard.   (Klein, 1995, p51)

Klein suggests that the cigarette's bad taste and poisonousness add to their sublimity; they are somehow edgy and dangerous. While e-cigarettes are a copy of a tobacco cigarette, their materiality differs - they contain none of tobacco's poisonousness and can be inhaled in a range of non-threatening-sounding flavours, such as 'caramel mocha', 'mango mirage' and 'apple grape breeze' (flavoured liquids produced by UK Ecig store). This makes them neither edgy nor dangerous, neither poetic nor sublime. The copy lacks the 'aura' of the original, as e-cigarettes lack the sublimity of tobacco cigarettes.

Discourses around pleasure, and certainly on sublimity, are notably missing from the debates on e-cigarette use. This is perhaps not surprising as these concepts are relatively neglected in public health more broadly. Notions of pleasure are ignored in the attempt to promote health and wider well-being, while addicts and substances are morally positioned (Coveney & Bunton, 2003).[3] Benson (2010) argues that dependence on nicotine has been increasingly medicalised and viewed as a chronic condition, while Bell and Keane (2012) note that nicotine has somewhat contradictorily been understood as both a cause and treatment for cigarette addiction.[4] The role of nicotine patches and chewing gum ('good' nicotine) have been situated as forms of treatment for cigarette addiction (caused by 'bad'

nicotine), reinforced through evidence of effectiveness demonstrated in research trials (Bell and Keane, *ibid*), much as current research on e-cigarette use seeks to establish. However Bell and Keane note that e-cigarettes have received a more hostile reception than other nicotine delivery treatments and suggest that this is because e-cigarettes challenge the distinction between nicotine as either a treatment or a harm, and therefore either 'good' or 'bad' nicotine. 'Good' nicotine should not resemble a cigarette, nor should it be connected to pleasure (Bell and Keane, 2012).

Furthermore, by replacing one substance for another, public health and medical discourses could be said to be controlling which substances the public are addicted to. This can be compared to the relationship between methadone and heroin, and the UK comedian Russell Brand's argument that that methadone is merely a medicalised form of heroin, allowing the state to control the substance that the individual is addicted to as a means of controlling addiction. The nicotine within e-cigarettes remains addictive, and through medicalisation the key difference in the promotion of e-cigarettes then becomes that it is *what* people are addicted to that is altered, rather than a removal of the addiction completely. This can be viewed as a further example of the medicalization of everyday actions, behaviour and objects which then become subject to biomedical control (Conrad, 1992), in this case meaning that government and biomedicine are able to select which substances the public are and are not allowed to become addicted to. Medicalisation justifies intervention and control, giving a foundation on which to base regulation of these products, but it does not take into account what the experience, use and material aspects of e-cigarettes may be.

E-cigarettes as better than the original

A key problem with the debate on e-cigarettes is that both sides assume that they know how to conceive of these objects and establish what e-cigarettes *are* - slippery slopes or Trojan horses. But based on these assumptions, we might consider other possibilities of what an e-cigarette might be. Abrams suggests that '[i]ndependent manufacturers of e-cigarettes could compete with tobacco companies and make the cigarette obsolete, just as digital cameras made film obsolete' (Abrams, 2013, p136). Rather than e-cigarettes being types of cigarettes or being simulants, e-cigarettes could be considered 'simulacra', the philosopher Jean Baudrillard's concept of imitations that become more 'real' or pleasurable that the real thing, which he links to postmodern culture. Baudrillard (1994[1981]) suggests that postmodern society is so dependent on models and maps *of* the world that we become out of touch with the *real* world. Contemporary examples of this might include individuals experiencing events unravelling in front of them through screens as they are filmed on mobile phones, or people turning away from the action to capture themselves within an image of it in the form of a 'selfie'. Objects that are simulacra link to Baudrillard's wider concern that we have lost contact with what is 'real', with consumer society and simulacrum taking over 'reality'. Plastic surgery and breast augmentation procedures, where the fake body and breasts are viewed as more desirable, is another example of the 'fake' becoming more 'real' than the original. Baudrillard suggests these objects are a form of 'hyper-reality'- through something becoming more real than the real, reality is abolished. Might e-cigarettes become 'even better than the real thing', more attractive than tobacco cigarettes themselves and more than a mix of tobacco cigarette and medical device?

It is possible also to argue that the e-cigarette market is already moving away from e-cigarettes being simulacra. E-cigarettes are becoming even less like tobacco cigarettes as they are being made to taste different, look different, and be more personalisable. E-cigarette development is linked to technological changes and may be limited and/or led by the

technology itself. Some commentators see a new generation of e-cigarettes being developed which will cause those presently in circulation to appear old-fashioned and obsolete. New relationships are formed with new objects and there is a huge and expanding range of e-cigarettes varying not only by design and chemical ingredient but also in contexts of use. These objects, and the practices that go alongside them, are far from stable, so that the entrenched arguments held up from within public health already make little sense to many users and non-users of e-cigarettes. More to the point, perhaps, is that while public health attempts to capture a notion of what an e-cigarette 'is', such objects are not singular and fixed, and they do not exist independently of environments. If we follow Mol's argument of multiplicity, debates in public health have already 'made' e-cigarettes into (at least) two different objects through their different constructions, objects that are likely to be constructed differently again through the practices of different users.

Constructing 'risky objects' in public health

While we might know little of the impact of e-cigarette use on the general population, the ways these objects have impacted on the field of public health is more evident. E-cigarettes have become part of public health science itself - the subject of seminars, papers and policy documents, creating research groups and alliances, grants and jobs. In efforts to generate evidence, the assumptions behind the relationships between objects, people and notions of behaviour have already worked themselves into the design and conduct of behavioural interventions and evaluations, with the enactment of e-cigarettes as particular 'things' being made and remade through ongoing discourses and practices. The construction of e-cigarettes is therefore not only shaped by public health but also shapes public health itself. This highlights the key issue within this debate - that e-cigarettes, like other objects, are inevitably embedded within and co-constituted through wider environments and cannot be examined

separately from these. Even as e-cigarettes are constructed in public health as static objects independent of contexts and practices, at the same time they are being further embedded within public health as objects that are dynamic and changing.

Public health science does not conceptualise objects in this dynamic way. As well as both sides of the debate constructing e-cigarettes based on tobacco cigarettes, e-cigarettes are also framed externally to their use, as static and independent objects separate from context. They are seen to have particular inherent qualities which mean that they are interchangeable with other similar objects, with e-cigarettes and tobacco cigarettes seen as a transposable 'thing'. This view of objects as separate and static is also one outside of time. As objects independent of context, they are not seen as changing over time, so that how they 'are' in the present will continue in the future. This is key for conceptualising risk - objects need to be viewed as consistent in order to have a predictable future outcome.

However, it is not only objects that are seen as external to context but also people, and the relationship between person and object - in this case smokers (potential, former or current) and cigarette (of whatever type) - is also constructed in a particular way. Through both sides of the argument e-cigarettes are viewed as determining the actions resulting from their use, with e-cigarettes practices resulting from what the e-cigarette does to the person. Through this set-up, the presence of a cigarette, whether a tobacco cigarette or an e-cigarette, acts on the smoker - the smoker does not influence this object but is a 'passive' user of it. Conceptualisations of risk within public health also set up such a relationship - a one-directional connection where the object acts on the individual in a fairly consistent way, across different groups of people and different environments, through a quality inherent to the object itself.

The object is seen to act on the individual as a psychological 'cue' to the smoker to perform the action of smoking - the impact seen to be so powerful in denormalisation arguments. Smoking behaviour is therefore constructed as a cognitive practice which occurs from a smoker choosing to smoke, or being prompted to smoke by the object. Through this framing addiction is a physical dependence on a substance, which impairs the cognitive process to freely choose to smoke or not smoke. Both addiction and behaviour, and therefore interventions to change behaviour within public health, become issues of will and psychological cueing, which situate behaviour within the individual's head. Blame and responsibility also emerge from this understanding, as an ability to make 'health' choices is framed as an individual issue and cognitive decision.

However, such a framing misses the multiple interactions between people, e-cigarettes, places, other people and other objects, and the ways in which these may contribute to actions. Indeed, rather than being situated in the head, health practices can instead be seen to emerge from assemblages of elements - objects, people, places, etc, which act together. Through these understandings, e-cigarettes are not one thing, separate from space and time, but rather are objects that emerge relationally from particular circumstances, potentially shaping not only the relationships held with tobacco cigarettes, but also the varied relations which compose healthy, moral 'bodies', and indeed what addiction might mean and how this is experienced. Practices around e-cigarettes may configure new kinds of socio-material relations and lead us to ask new questions, not only about e-cigarettes but about health, mind-body relationships and morality.

This understanding of people and objects as independent, bounded and disconnected from wider contexts of course means that RCTs generating a public health evidence base are better able to pin down the impact of objects. Conceptualising objects and people in this way makes them measurable and manageable, again situating responsibility within the

individual. However the material-semiotic practices of public health, through which debates and evidence-gathering on e-cigarette risk emerge, draw on particular fixed *a priori* assumptions to frame objects, people and the relationship between them - frames which not only miss but actively exclude alternative ways through which people might enact e-cigarettes. New practices, relationships and differing socio-cultural patterns of smoking, some of the very aspects that researchers in this area declare they are interested in examining, may be found within the very relations that public health researchers have already presupposed. However, there are wider consequences of a shift to conceptualising objects as 'made' or enacted through practices. If e-cigarettes are constituted differently in different arenas and at different time periods, one fixed and definitive version of an e-cigarette cannot be captured in this way. How then might the riskiness of a technology be assessed? And if objects and individuals do not interact in such a manner, how might these affect conceptualisations of an individual responsibility for health?

Disagreements within the public health e-cigarette debate are unlikely to be resolved because both sides are in the end talking about different things. Different sides in the debate enact different objects through their practices and discourses, even if they draw on similar conceptualisations of objects, people and their relationship to do so. The e-cigarette-objects that emerge from each side may not be recognisable to e-cigarette smokers themselves. These practices and discourses set up their own socio-material relations. PMDs emerge from and impact on material-semiotic practices within medicine as well as outside it, no matter how static and separate medicine might frame these as being. Neither what an object 'is' nor whether it is 'risky' are therefore elements intrinsic to a particular technology, as technologies are not singular things. Instead, the qualities of objects are relational and emerge from how these are enacted in practices. 'Riskiness' emerges as an

attribute ascribed by medicine as a future trajectory of just one of the multiple objects made through these different constructions.

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