

<p><b>Institution: University of East London</b></p>
<p><b>Unit of Assessment: 4</b></p>
<p><b>Title of case study:</b> Informing public and policy debate about and improving understanding of the effects of cigarette and e-cigarette smoking</p>
<p><b>1. Summary of the impact</b></p> <p>UEL's Drugs and Addictive Behaviours Research Group (DABRG) was the first UK group to demonstrate that regular smoking can cause stress and depression. This work has had - and continues to have - a significant impact on public awareness and understanding of the effects of smoking on mood and cognition. Input into the Department of Health Consultation on the Future of Tobacco Control has directly fed into UK Tobacco Control Policy. More recent research on electronic cigarettes has informed public health professionals, smokers and users about the nature and effects of e-cigarette use. In particular, the work has underpinned the development and delivery of new and improved evidence-based information resources for use by these stakeholders. It has also delivered commercial benefits for e-cigarette manufacturers, whose marketing strategies, lobbying activities and preparations for regulatory control have been directly informed by this work.</p>
<p><b>2. Underpinning research</b></p> <p>The research underpinning impacts described here stems from a history of nicotine and smoking-related empirical work conducted by the Drugs and Addictive Behaviours Research Group (DABRG; formerly the Recreational Drugs Research Team) at UEL. This began in 1993 with work by Professor Andrew Parrott (at UEL until 2004; now Swansea), an international authority on the psychobiological and cognitive effects of nicotine/smoking in humans. Between 1993 and 2004 Parrott worked at UEL with Dr John Turner and Dr Kirstie Soar. The group's work has been enhanced by the addition of Dr Lynne Dawkins' (joined UEL 2006), whose recent work has focused particularly on electronic cigarettes (e-cigarettes). The group has published many widely-cited research and review papers into the psychobiological and cognitive impacts of nicotine.</p> <p>Parrott and colleagues examined the acute and chronic effects of nicotine on mood and cognition, and were the first research group to demonstrate that cigarette smoking can actually cause stress and depression. Smokers were shown to feel 'normal' only when nicotine cravings were satiated; during periods of abstinence (e.g. between cigarettes), mood and cognitive functioning soon begins to deteriorate, such that the apparent mood and cognitive 'gains' associated with smoking represent only the temporary return to a 'normal' level of functioning [1].</p> <p>These findings have been confirmed since 2007 by Dawkins, who demonstrated that negative mood and lack of responsiveness to everyday rewards or pleasurable activities are more prominent during abstinence than after recent nicotine ingestion [2], and improve over several weeks of successful abstinence [3]. Poor inhibitory control in abstinent smokers, however, was shown not to recover even with protracted (3 month) abstinence and can predict relapse during a quit attempt [3, 4].</p> <p>Since 2009 the group has been one of the first worldwide, and certainly the first in the UK, to conduct research into the nature of electronic cigarette (e-cigarette) use and its effects on tobacco craving, withdrawal symptoms and cognition effects on tobacco-related withdrawal symptoms and cigarette smoking behaviour. The UEL team has demonstrated that the e-cigarette can alleviate cigarette craving and withdrawal symptoms [5] and was the first in the world to show alleviation of prospective memory-impairment following acute e-cigarette use in abstinent smokers [6].</p> <p>In 2013, the group published the first survey of European e-cigarette users. This revealed that 76% of e-cigarette users started using because they wanted a complete alternative to smoking; 74% reported not smoking cigarettes at all for at least a few weeks since starting to use e-cigarettes [7].</p>
<p><b>3. References to the research</b></p> <p>The following outputs are all peer-reviewed articles published in journals with impact factors</p>

## Impact case study (REF3b)

exceeding 2.5 (median: 4.08). Collectively, they have over 217 citations (Google, June 2013).

1. Parrott AC, Garnham NJ, Wesnes K, Pincock C (1996). Cigarette smoking and abstinence: comparative effects upon cognitive task performance and mood state over 24 hours. *Human Psychopharmacology*, 11: 391-400. <http://bit.ly/17zMKJM>
2. Dawkins, L., Powell, J.H., West, R., Powell, J. & Pickering, A. (2007). A double-blind placebo controlled experimental study of nicotine: II effects on response inhibition and executive functioning. *Psychopharmacology*, 190 (4): 457-467. [doi:10.1007/s00213-006-0634-6](https://doi.org/10.1007/s00213-006-0634-6)  
Submitted to RAE2008 submission, which rated 97.9% of Dawkins' outputs at 2\* or above.
3. Dawkins, L., Powell, J.H., Pickering, A., Powell, J. & West, R. (2009). Patterns of change in withdrawal symptoms, desire to smoke, reward motivation, and response inhibition across three months of smoking abstinence. *Addiction*, 104 (3): 850-858. [doi:10.1111/j.1360-0443.2009.02522.x](https://doi.org/10.1111/j.1360-0443.2009.02522.x)
4. Powell, J., Dawkins, L., West, R., Powell, J. & Pickering (2010). Relapse to smoking during unaided cessation: Clinical, cognitive, and motivational predictors. *Psychopharmacology*, 212(4): 537-49. [doi:10.1007/s00213-010-1975-8](https://doi.org/10.1007/s00213-010-1975-8)
5. Dawkins, L., Turner, J., Hasna, S. & Soar, K. (2012). The electronic-cigarette: Effects on desire to smoke, mood and cognition. *Addictive Behaviours*, 37: 970-973. [doi:10.1016/j.addbeh.2012.03.004](https://doi.org/10.1016/j.addbeh.2012.03.004)
6. Dawkins L, Turner J, Crowe E. (2013) Nicotine derived from the electronic cigarette improves time-based prospective memory in abstinent smokers. *Psychopharmacology* 227(3): 377-84. [doi: 10.1007/s00213-013-2983-2](https://doi.org/10.1007/s00213-013-2983-2)
7. Dawkins, L., Turner, J., Roberts, A. & Soar, K. (2013). Vaping profiles and preferences: An online survey of electronic cigarette users. *Addiction*, 108 (6) 1115-1125. [doi:10.1111/add.12150](https://doi.org/10.1111/add.12150)

#### 4. Details of the impact

##### Informing and influencing UK public policy formulation.

Dawkins drew on the findings of her research with smokers attempting cessation to co-author a response on behalf of the British Psychological Society (BSP) to the 2008 Department of Health (DoH) consultation on the Future of Tobacco. The BSP consultation report [a] closely reflects key findings of her research: its recommendations that Government priorities focus on helping smokers to quit, tailoring interventions to individuals, and supporting the development of new interventions, drew particularly strongly on work published in [2]. That consultation represented the first step in the development of a new national tobacco control strategy aimed at reducing smoking rates and health inequalities caused by smoking; protecting children and young people from smoking; supporting smokers to quit; and helping those who cannot quit. Publication of the full consultation report, which has remained freely available on the DH website, was announced in Parliament on 9 December 2008 by the Secretary of State for Health, Alan Johnson [a]. It was also the subject of a widely distributed Department of Health press notice.

The consultation led to the introduction of tobacco control legislation in the Health Act 2009. This included the introduction of regulations ending both the sale of tobacco products from vending machines (from 1 October 2011), and open public displays of tobacco products in supermarkets and other large stores (from 6 April 2012) and in small shops/all other places (6 April 2015). These changes reflected key recommendations made by Dawkins and colleagues [1, 2] to focus on reducing tobacco advertising, marketing and promotion and reducing the availability and supply of tobacco products.

Dawkins' e-cigarette research has also informed national policy via its use by the UK Government Department of Health Medicines and Healthcare Regulatory Agency (MHRA), which cited [5] and [7] in its recently published final report on a review (starting February 2010) of the use, quality and safety of e-cigarettes, and their potential impact on public health and regulation. More specifically, the articles were presented as evidence considered by the Commission of Human Medicines Expert Working Group on Nicotine Containing Products in formulating its advice to ministers to regulate e-cigarettes as medicines [b]. In June 2013, the MHRA announced the government's

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intention to regulate electronic cigarettes and other nicotine containing products (NCPs) as medicines.

The research has further contributed to UK policy discussion and debate via Dawkins' invited presentation of the results of [5] and [7] at a Parliamentary Round Table discussion of e-cigarettes led by Lord Hutton at the House of Lords in July 2013, and at a London Drug and Alcohol Policy Forum (LDAPF), where she sat as an expert member of a Panel on e-cigarettes and tobacco harm reduction. It has, moreover, informed policy debate beyond the UK: in the USA, for example, several articles published by Dawkins – including [7] – are cited in an article on the website of Americans for Nonsmokers' Rights, the leading US national anti-smoking lobbying organisation [c].

**Engaging public audiences via contributions to international media discourse.**

Beyond their direct influence on policy-makers' discussion, debate and decisions, key findings of the UEL studies have informed and enhanced broader public engagement with important issues relating to the research. This has been achieved particularly through their use to generate and inform media discourse about nicotine and smoking cessation across a range of national and international media outlets, including newspapers, TV and radio. Dawkins' recent finding that 74% of e-cigarette users have quit smoking [7], for instance, generated considerable media attention. It was featured in more than 30 news articles across the world, including features for Fox News (5 April 2013) and New York Daily News (5 April 2013). Closer to home, it formed the basis for stories in the Irish Independent (25 April 2013) and on the front page of the daily London paper, The Metro (11 April 2013), which reaches an average readership of 1.9million [d]. Public engagement with the content of that article is suggested by the fact that more than 100 comments on it were posted on the Metro's online edition; it has since been shared some 3,000 times on Facebook and discussed in almost 250 tweets, all of which activity has also extended the reach of its original impacts on public awareness of the potential health implications of e-cigarette use.

**Increasing the evidence basis for and enhancing the accuracy of information resources for health practitioners and public audiences.**

The finding that e-cigarettes improve withdrawal symptoms, craving and memory has also been widely cited across electronic information media with large public readerships - including Wikipedia [e] – and to support the development of information resources specifically intended to support smoking cessation. To that end, research insights have been shared particularly with e-cigarette users, healthcare providers, practitioners, and independent public health researchers, as well as with the media. Recent examples of their use to develop new or improved reusable public information resources include the inclusion of findings reported in [7] in an e-cigarette fact sheet produced by Action on Smoking and Health (ASH) Scotland [f]. The provision of an expert information service is a prominent objective of this independent charity set up to improve health and quality of life by limiting the number of young people taking up smoking, reducing the number of adult smokers, protecting people from second hand smoke and tackling inequality resulting from tobacco use. Both the research behind and the findings published in [7] are also discussed in detail on the NHS Choices webpage, which had received 4,939 hits (well above the average of 1-2000) by 31 July 2013 [g].

Dawkins' finding that quitting smoking improves mood [3], has also informed various widely-used public health information resources, including on international sites. It is cited, for example, in an article about managing the mood changes associated with quitting smoking, published on the 'Virtual Medical Centre' [h]; written entirely by health professionals, Virtual Medical Centre is Australia's leading source for trustworthy medical information.

The extent of public interest in and use of these information resources relating to e-cigarette use is suggested by the fact that they had, by 31 July 2013, prompted more than 40 direct e-mails to the research team. These included messages from independent e-cigarette advisors, smokers/e-cigarette users, and health professionals working with smokers, who have stated that the findings have helped them to advise smokers on e-cigarette use. To maximise the reach of public engagement with and understanding of important health issues relating to e-cigarettes, Dawkins delivered a public lecture on her research at UEL on 7 July 2013. The reach of this public engagement event was extended further by the subsequent upload of a video of the lecture to

YouTube; the video had generated 3000 hits in the three weeks to the end of July 2013 alone.

**Benefits to companies: informing staff within and supporting lobbying by e-cigarette companies.**

The research on e-cigarettes has both resulted from partnerships with e-cigarette companies and subsequently been used by those companies, with some important benefits to them. In 2009, DABRG developed its partnership with The Electronic Cigarette Company (TECC) and Totally Wicked E-Liquids (TWEL), whose products were used in the research leading to [5]. These collaborations have been maintained since the end of that research project, and the research group's work continues to inform activity and ensure familiarity within the company with up-to-date scientific work on e-cigarettes. Thus, TWEL have discussed DABRG work in their newsletters, and provide links to published papers on their website, which receives 250,000 visits each week [i]. In March 2013, the company ran a competition encouraging users to read the Dawkins et al. papers and present a research proposal [j]. More than 80 people from the UK, Germany and the USA submitted entries, which were judged by Dawkins. DABRG and TWEL are currently seeking grant funding support to implement the winning research proposal. Dawkins and Turner have also presented the findings of [7] to 60+ staff members at TWEL's offices in Blackburn (15<sup>th</sup> May 2013). Since early 2013 TWEL have, moreover, used the research findings published in [5] and [7] in their extensive lobbying of the 700+ Members of the European Parliament (MEPs) involved in the EVNI Tobacco Products Directive (TPD), in an attempt to remove e-cigarettes from the TPD [j].

DABRG's work with these companies led to an approach in Spring 2012 from a third e-cigarette manufacturer, SKYCIG, resulting in a funded study on e-cigarette blood nicotine delivery, which demonstrated that e-cigarettes lead to consistent measurable levels of blood nicotine [6]. SKYCIG will use the results of this and previous studies [5, 7] to support their application to the MHRA for medical licensing.

**5. Sources to corroborate the impact**

- a. For Dawkins' Contribution to the BSP response to the 2008 Department of Health consultation on the Future of Tobacco: <http://bit.ly/1e3khxE> p. 1. References to [2] at p. 6. Alan Johnson's announcement of the release of the consultation on the future of tobacco control (based in part on findings published in [7]) may be viewed at: <http://bit.ly/1czQtVi> col. 46WS-47WS.
- b. For reference to [5] and [7] by the MHRA in its 2013 'Current use of electronic cigarettes' review: <http://bit.ly/1cwielO> p 14. The addendum to that review, which also discusses [7], may be found at: <http://bit.ly/1iDvtOW>
- c. For use of the research by Americans for Nonsmokers' Rights: <http://bit.ly/1hBWZi9>
- d. For national and international media coverage of findings published in [7]: <http://fxn.ws/1cvR3rn> (Fox News); <http://nydn.us/1aQRlYr> (New York Daily news); <http://bit.ly/1cvRZvJ> (Irish Independent). For its coverage on the front cover of the Metro: <http://bit.ly/16Vizqy>.
- e. For reference to [5] on Wikipedia: [http://en.wikipedia.org/wiki/Electronic\\_cigarette](http://en.wikipedia.org/wiki/Electronic_cigarette)
- f. For reference to [5] in the ASH Scotland E-cigarette Fact Sheet: <http://bit.ly/16Vql4I> n. 44
- g. For reference to findings published in [7] on the NHS Choices Website: <http://bit.ly/1aRJ6th>. The number of hits is corroborated in an email from a member of the Behind the Headlines Team. Available on request.
- h. For reference to findings published in [3] on Virtual medicalcentre.com: <http://bit.ly/HlcsFk> n. 6
- i. For the inclusion of links to [5] and [7] on the TWEL website: <http://bit.ly/17Euz3m>
- j. A factual statement may be obtained from the Managing Director at Totally Wicked to corroborate the impacts of [5] and [7] on their lobbying activities and report to the EU.