Institution: Staffordshire University

Unit of Assessment: 4 – Psychology, Psychiatry and Neuroscience

Title of case study: Giving up to save face? Investigating the impact of age-appearance facial morphing on women's smoking.

1. Summary of the impact

Clark-Carter and colleagues' research on impact of facial morphing technology on smoking cessation has given national and international smoking cessation programmes a strong evidence base for the importance of focusing on the negative effects of smoking on personal appearance as well as on health. The work has impacted internationally; the developers of the software utilised in our studies (*Aprilage Inc*.) have used the research as evidence for effectiveness of their software, and stop smoking websites in the USA, Canada, and Ireland cite our research in full. In the UK, at least three Stop Smoking Services have incorporated age-appearance morphing programmes into their practice as a direct result of workshops on our research findings, and the *Operation Smokestorm* smoking prevention initiative (used by more than 100 schools across the UK) uses our research findings as part of the rationale for focusing on the appearance-damaging effects of smoking in the intervention.

2. Underpinning research

Outline of research

Researchers in the Centre for Health Psychology have been involved in research linking appearance to health promotion since 2001. Our focus on smoking began in 2009, in which pilot work (Grogan *et al*., 2009) established that young women smokers were more concerned about the impact of smoking on appearance than on their health. It was therefore decided to investigate the effectiveness of an age-appearance technique that showed young women smokers the impact of smoking on their own faces. We did this using sophisticated age-appearance morphing software which enabled us to show women their own faces aged up to 72 years old with and without smoking. A qualitative study (Grogan *et al.* 2010) used focus groups and interviews to investigate 47 women smokers' accounts of being exposed to these images both while they were looking at the images and retrospectively. A quantitative study investigated impact of the age-appearance intervention in a randomised controlled trial that compared 35 women exposed to the intervention with 35 in a control condition (Grogan *et al*., 2011). The work has led to an MRC NPRI grant on smoking prevention 2012-2017.

Key researchers, dates, roles

This work has been led by a team at Staffordshire University. Professor David Clark-Carter has been involved from September 2001 to present. Keira Flett was employed as Research Assistant between September 2009 and April 2011, and continues to assist on the project. This research also involved collaboration between the Staffordshire University Psychology team (including Professor Sarah Grogan now at Manchester Metropolitan University) and Professor Rachel Davey at University of Canberra, Professor Mark Conner at University of Leeds, and Professor Brendan Gough now at Leeds Metropolitan University and with health professionals involved in public health and smoking cessation (Deborah Richardson and Giri Rajaratnam at Stoke and East Midlands Primary Care Trusts).

Context

Smoking presents a significant economic burden to the National Health Service and most quit attempts fail. Health-related anti-smoking campaigns fail to motivate most smokers to quit, and there is growing evidence that young women respond better to threats to appearance than risks to health. The studies carried out by Staffordshire University on effects of facial morphing on smoking attitudes and behaviour are the first to investigate in a controlled way the psychological impact of this kind of intervention on smoking cessation.

Findings

Women reported being highly motivated to quit smoking as a result of the intervention, with two thirds of participants saying that they intended to quit after exposure to the intervention, linked with increased perceived personal responsibility for quitting. There were also statistically significant changes in attitudes to quitting smoking and increased intentions to quit smoking immediately after exposure. Nicotine dependence and self-reported smoking were also significantly lower in the intervention compared to control group at four weeks follow-up. These studies suggest that facial morphing interventions may be useful adjuncts to traditional cessation programs, especially with young women smokers. Work is continuing, to investigate impact of the intervention on men.

3. References to the research

Details of key outputs

All publications below are published in peer reviewed journals with high impact factors. Full references for each and impact factors are supplied:

Grogan, S., Flett, K., Clark-Carter, D., Gough, B., Davey, R., Richardson, D., & Rajaratnam, G. (2010). Women smokers' experiences of an age-appearance anti-smoking intervention: A qualitative study. *British Journal of Health Psychology, 16*, 675-689. Impact factor: 2.336.

Grogan, S., Flett, K., Clark-Carter, D., Conner, M., Davey, R., Richardson, D. & Rajaratnam, G. (2011). A randomized controlled trial of an appearance-related smoking intervention. *Health Psychology, 6*, 805-9. Impact factor 3.982.

Flett, K., Clark-Carter, D., Grogan, S., & Davey, R. (2013). How effective are physical appearance interventions in changing smoking perceptions, attitudes and behaviours? A systematic review. *Tobacco Control*. *22*, 74-79. Impact Factor: 3.077

Grants Supporting This Research

Grogan, S., Clark-Carter, D. Appearance and smoking: An Investigation of effectiveness of an age-appearance morphing intervention. Stoke Primary Care Trust September 2009-April 2011, £132,000.

4. Details of the impact

Process of dissemination

Two papers were published high-impact international peer reviewed journals (*British Journal of Health Psychology* and *Health Psychology),* and papers were presented at the *Appearance Matters* conference (that attracts both academics and health care professionals) in July 2010 and July 2012. This led to contacts from academics and health professionals from the UK and USA as well as significant media interest (see below). The work was reported in full in a number of health-related websites (see below) and in newspaper articles (e.g. *The Sentinel*) and magazines (e.g. *Marie Claire*). A report on both studies was passed to Stoke Primary Care Trust (who had funded the work) and we discussed the applications of the work with them. As part of the report we produced a list of recommendations for practice.

Data from the research were also disseminated through workshops with health professionals engaged in smoking cessation within a 30 mile radius of Stoke on Trent in September 2010 and March 2011 at Staffordshire University, and through a session at the Royal Free hospital in London in May 2013. These sessions incorporated details of psychological underpinnings of the technique, and led to several new links between us and local stop smoking services. We trained stop smoking staff from Staffordshire County Council and South Staffordshire Primary Care Trust (PCT) in how to use the technology, which is now incorporated into their routine practice. We have discussed with them how to use this most effectively, based on our research findings, and have carried out an evaluation of their stop smoking services, including their use of this software.

Who has benefitted?

- 63 Health Professionals involved in smoking cessation (smoking cessation advisors, consultants and public health professionals, clinical psychologists, and a pharmacist) have attended research dissemination workshops at Staffordshire University, Staffordshire County Council, and at the Royal Free hospital.

- 249 smokers have been exposed to the software as part of the research, and more than 4,200 through South Staffordshire Stop Smoking Services.
- Groups developing smoking-related interventions and needing evidence on whether to incorporate an appearance-related element (such as *Kick Butt*).
- 95 health psychology trainees at Staffordshire University, and Deakin University, Melbourne have been taught about the research intervention.
- *Aprilage Inc*. (distributers of morphing software used in studies).

How have they benefitted?

People running Stop Smoking Services in Staffordshire and across the UK have benefitted by being made aware of the potential effectiveness of facial morphing software and being trained how to use it most effectively. Smokers around Staffordshire have also benefitted since this software is now used as part of their package of stop smoking materials. We have demonstrated statistically significant increases in quit rates in these smokers in follow-up research studies, and anecdotal reports from stop smoking services in these areas suggest that our training has enabled stop smoking workers to increase their clinical effectiveness. Our work is used as part of the evidence base for *Operation Smokestorm* (used by more than 100 schools in the UK) to provide a rationale for an appearance focus in stop smoking materials. Health psychology trainees and other health professionals have also benefitted from learning about the psychological underpinnings of appearance-related interventions based on our research. *Aprilage Inc*. have benefitted through research evidence supporting effectiveness of software.

Dates

- Public health events at Staffordshire University: September 2010 and March 2011 (50 attendees).
- Dissemination to health professionals: May 2013 (Royal Free Hospital, London; 10 attendees).
- Dissemination to trainee health psychologists: March 2012, March 2013 (95 students).
- Training event at Staffordshire County Council (3 attendees): July 2011. Dissemination of the *BJHP* paper to *Aprilage Inc*.: December 2010.
- Dissemination of the *Health Psychology* paper to *Aprilage Inc*.: July 2011.
- *Sentinel* articles December 2010, December 2012, April 2013. *Marie Claire* article December 2010.
- Health-related website coverage December 2010-present (see below).
- *Operation Smokestorm* report: August 2011.

Evidence

- *Aprilage Inc*. use our research as one of the key elements of the evidence base for effectiveness of their age-appearance software and cite Staffordshire University as their key academic source on www.april.com.
- The developers of the *Operation Smokestorm* resource cite our research as evidence for effectiveness of age-appearance interventions and for incorporating these into the resource aimed at young people. See quote below and: www.lockinlearning.org.uk/oss_report_aug2011.pdf
- South Staffordshire Stop Smoking Services are now using the software extensively in their practice as a direct result of lead staff reading our research articles. See quote below and http://nhslocal.nhs.uk/story/lifestyle/white-van-used-deliver-smoking-cessation-services

5. Sources to corroborate the impact

Aprilage Inc. - can corroborate the claim that they use our research as one the key elements of the evidence base for effectiveness of their age-appearance software.

The developers of the *Operation Smokestorm* initiative cite our work as evidence for effectiveness of age-appearance interventions saying:

"Based upon recent research findings that highlight the benefits of using age progression

software [REF: Grogan et al., 2010] and Kick Butt's own positive experience of using this morphing technology on young people, the decision was made to view health risks in a broader sense and widen focus to include smoking's negative effect on personal appearance. Therefore, in addition to more serious smoking related health risks, such as cancer, action was taken to include premature ageing of the skin and eyesight in the resource (p.9)."

South Staffordshire PCT Stop Smoking Services can corroborate extent of impact on their Stop Smoking services.
A tobacco control coordinator at South Staffordshire PCT (who approached us to organise training for his staff after the initial publication in *British Journal of Health Psychology)* was impressed by the research finding that people were shocked into quitting smoking after seeing the morphed images: "The software is able to give a direct comparison between how someone would look if they aged normally and how they would appear if they continued to smoke, such as drying out their skin, having lots more wrinkles, and affecting their skin tone. That can be a real shock to people and is certainly a great draw." (http://nhslocal.nhs.uk/story/lifestyle/white-van-used-deliver-smoking-cessation-services.)

Websites in USA, Canada, Ireland, the Netherlands, Russia, Italy and the UK cite our work in full. For instance:

1. http://www.sciencedaily.com/releases/2010/12/101206211709.htm
   http://news.softpedia.com/news/Shock-Is-the-First-Step-to-Stop-Smoking-170926.shtml
2. http://www.irishhealth.com/article.html?id=18323
3. http://www.news-medical.net/news/20101207/2042/Dutch.aspx
4. http://www.news-medical.net/news/20101207/Smokings-effect-on-face-induces-women-to-quit-the-habit.aspx
5. http://www.tvojapluca.rs/clanak.php?id=45&tip=novost (Russian article)

http://www.newsfood.com/q/f05ec712/il-fumo-ti-fa-brutta-cos-le-donne-smettono-con-le-quot-bionde-quot/ (Italian article)