

## Commentary on Shahab & McEwen (2009): Understanding and preventing attrition in online smoking cessation interventions: a self-regulatory perspective

Online interventions designed to promote behaviour change hope to deliver relatively intensive interventions to large numbers of people. However, Shahab & McEwen's review [1] of this infant field in relation to smoking cessation [only 11 randomized controlled trials (RCTs), all published in the last 4 years] points usefully to an important issue that may thwart this hope—high rates of attrition. Across the reviewed interventions loss to follow-up tended to be high, albeit variable, ranging from 7 to 73%. High attrition rates potentially undermine what can be concluded from reviews such as Shahab & McEwen's because there are rarely any outcome data on drop-outs [2]. Following published recommendations [3], intention-to-treat analyses take a conservative perspective and assume that smokers drop out because they have abandoned their quit attempt. More seriously, however, high attrition rates undermine what can be achieved with online smoking interventions because interventions cannot be effective if people are not exposed to them. Even among smokers who provided follow-up data, use of intervention materials among the studies reviewed varied from 37% of that recommended [4] to 95% [5]. Furthermore, more frequent use of intervention materials was associated with higher abstinence rates [1,4]. Therefore, two key issues for online interventions are: (i) why does attrition occur; and (ii) how can attrition be prevented?

The problem of attrition is not unique to online interventions and many good reviews of determinants and solutions have been published in other domains [6,7]. Rather than reiterate these points, this commentary emphasizes that attrition can be viewed profitably as an example of self-regulatory failure. Self-regulatory failure occurs when people 'fail to engage in a behaviour that would bring about attainment of the goal' ([8], p. 92). Thus, non-use of intervention materials can be viewed as a behaviour that moves the smoker further away from their goal of abstinence. According to a self-regulatory perspective [8,9] there are three main reasons why attrition might occur: (i) deficient goals; (ii) inadequate monitoring; or (iii) inadequate strength.

First, it is possible that smokers' are simply not motivated to interact with the intervention materials. Low motivation to engage with an intervention can be due to problems with the intervention itself. For example, changing the format of an online smoking intervention to appear as an online college life magazine increased

long-term use of an intervention [5]. Alternatively, low motivation may occur because smokers no longer want to quit smoking. For example, when smokers were contacted to find out why they had left an online programme many reported that this was due to stressful life events [10]. It seems likely that such stressful events promoted a shift in priorities [11] or a return to smoking as a coping mechanism. Taken together with Shahab & McEwen's finding, that interventions were effective only when aimed at smokers who were motivated to quit, it is clear that a key issue for online smoking cessation interventions is how to ensure consistently high levels of quitting motivation.

Secondly, attrition may occur because people fail to monitor their behaviour. That is, smokers may be motivated to quit and to interact with the intervention materials, but simply forget that they need to engage with the intervention. In support of this idea, Shahab & McEwen note that 'the use of websites quickly tapered over time'. One solution to this problem is to reduce the need for self-monitoring via prompts or reminders [10]. Some online interventions even provide small gifts to participants to remind them to visit the website [12]. Designers of online interventions might also usefully consider factors that impair smokers' ability to monitor their actions, not least alcohol [13]. For example, it may be prudent to require smokers to use intervention materials in the morning rather than the evening.

Finally, attrition may occur because smokers struggle to interact with the intervention materials. This can be the result simply of difficulties with internet access (the reason why some online interventions provide computers to their smokers [14]) or because the smoker lacks the 'self-regulatory strength' to engage with the materials. Muraven & Baumeister [15] show that peoples' capacity for exerting self-control is limited, such that using self-control in one domain (e.g. resisting cigarettes) reduces temporarily the self-control available for subsequent efforts (e.g. resisting the temptation to watch television in order to log onto an online intervention). However, studies also suggest that these depletions of self-control can be overcome by practising self-control [16], drinking lemonade to boost blood glucose [17], challenging participants' expectations about self-control [18] or forming specific behavioural plans known as implementation intentions [19]. Future online interventions for smoking cessation might capitalize on these advancements to

prevent depletions in self-control leading to attrition in online interventions.

#### Declaration of interest

None.

**Keywords** Attrition, behaviour change, intervention, online, smoking.

THOMAS L. WEBB

Department of Psychology, University of Sheffield,  
Western Bank, Sheffield S10 2TN, UK.  
E-mail: t.webb@sheffield.ac.uk

#### References

- Shahab L., McEwen A. Online support for smoking cessation: a systematic review of the literature. *Addiction* 2009; **104**: 1792–804.
- Hollis S., Campbell F. What is meant by intention to treat analysis? Survey of published randomised controlled trials. *BMJ* 1999; **319**: 670–4.
- Velicer W., Prochaska J., Rossi J., Snow M. G. Assessing outcome in smoking cessation studies. *Psychol Bull* 1992; **111**: 23–41.
- Japuntich S. J., Zehner M. E., Smith S. S., Jorenby D. E., Valdez J. A., Fiore M. C. *et al.* Smoking cessation via the internet: a randomized clinical trial of an internet intervention as adjuvant treatment in a smoking cessation intervention. *Nicotine Tob Res* 2006; **8**: S59–67.
- An L. C., Perry C. L., Lein E. B., Klatt C., Farley D. M., Bliss R. L. *et al.* Strategies for increasing adherence to an online smoking cessation intervention for college students. *Nicotine Tob Res* 2006; **8**: S7–12.
- Ribisl K. M., Walton M. A., Mowbray C. T., Luke D. A., Davidson W. S., Bootsmler B. J. Minimizing participant attrition in panel studies through the use of effective retention and tracking strategies: review and recommendations. *Eval Prog Plann* 1996; **19**: 1–25.
- Turk D. C., Rudy T. E. Neglected factors in chronic pain treatment outcome studies—referral patterns, failure to enter treatment, and attrition. *Pain* 1990; **43**: 7–25.
- Baumeister R. E., Heatherton T. F. Self-regulation failure: an overview. *Psychol Inq* 1996; **7**: 1–15.
- Carver C. S., Scheier M. F. Control theory: a useful conceptual framework for personality, social, clinical, and health psychology. *Psychol Bull* 1982; **92**: 111–35.
- Brendryen H., Kraft P. Happy ending: a randomized controlled trial of a digital multi-media smoking cessation intervention. *Addiction* 2008; **103**: 478–84.
- Schroevers, M., Kraaij V., Garnefski N. Goal disturbance, cognitive coping strategies, and psychological adjustment to different types of stressful life event. *Pers Individ Diff* 2007; **43**: 413–23.
- Buller D. B., Woodall W. G., Zimmerman D. E., Slater M. D., Heimendinger J., Waters E. *et al.* Randomized trial on the 5-a-Day, the Rio Grande Way website, a web-based program to improve fruit and vegetable consumption in rural communities. *J Health Commun* 2008; **13**: 230–49.
- Hull J. G. A self-awareness model of the causes and effects of alcohol consumption. *J Abnorm Psychol* 1981; **90**: 586–600.
- Patten C. A., Croghan I. T., Meis T. M., Decker P. A., Pingree S., Colligan R. C. *et al.* Randomized clinical trial of an internet-based versus brief office intervention for adolescent smoking cessation. *Patient Educ Couns* 2006; **64**: 249–58.
- Muraven M., Baumeister R. F. Self-regulation and depletion of limited resources: does self-control resemble a muscle? *Psychol Bull* 2000; **126**: 247–59.
- Muraven M., Baumeister R. F., Tice D. M. Longitudinal improvement of self-regulation through practice. *J Soc Psychol* 1999; **139**: 446–57.
- Gailliot M. T., Baumeister R. F., DeWall C. N., Maner J. K., Plant E. A., Tice D. M. *et al.* Self-control relies on glucose as a limited energy source: willpower is more than a metaphor. *J Pers Soc Psychol* 2007; **92**: 325–36.
- Martijn C., Tenbult P., Merckelbach H., Dreezens E., de Vries N. K. Getting a grip on ourselves: challenging expectancies about energy loss after self-control. *Soc Cogn* 2002; **20**: 441–60.
- Webb T. L., Sheeran P. Can implementation intentions help to overcome ego-depletion? *J Exp Soc Psychol* 2003; **39**: 279–86.

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.