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# Finding better ways of motivating and assisting smokers to stop: Research at the CRUK Health Behaviour Research Centre

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### The problem of cigarette smoking

A major goal of Health Psychology is to find better ways of encouraging and helping people to stop doing things that are bad for their physical or mental health but which they enjoy or that meet immediate needs. For the majority of people who smoke cigarettes, stopping smoking is the change in their behaviour that would make the biggest improvement to their life-expectancy. Most smokers know this and try to stop repeatedly, but they also fail repeatedly. Table 1 summarises the problem.

### What we know about combating smoking

Of all the areas of health-related behaviour, smoking cessation is arguably the one that has the strongest evidence base in terms of proven methods of motivating attempts at change and improving the long-



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**Table 1: The problem with cigarette smoking (see West & Shiffman, 2007)**

- ▶ After the age of about 35 years, each year that stopping is postponed loses the smoker an average of 3 months of life
- ▶ Whereas in countries such as the UK almost half of all smokers try to stop in a given year, only about 2% actually succeed in the long term
- ▶ Smokers spend more of their lives suffering from diseases of old age than do non-smokers
- ▶ Smoking prevalence has declined substantially in countries such as the UK since the 1960s but it now appears to be stuck at over 20% and in many developing countries prevalence is increasing
- ▶ With the most effective methods of cessation, only 25% of quit attempts succeed in the long term
- ▶ Even in the UK where help with stopping smoking is more readily available than almost anywhere in the world, most quit attempts are made completely unaided and fewer than 5% use the combination of psychological assistance and medication that gives them the best chance of succeeding.

term success of those attempts. Table 2 summarises what we know.

Despite this, smoking prevalence in western countries is falling only very slowly and in many parts of the world, such as China, it is rising. The annual death toll from tobacco is currently estimated at 5 million and if current trends continue tobacco will kill more than 1 billion people this century (World Health Organisation, 2008). It is clear, therefore, that much more needs to be done to reduce the extraordinary toll of death and suffering caused by cigarettes.

A great deal can be done simply by governments implementing measures that are already known to be effective. These measures are embodied in the first ever global health treaty: The Framework Convention on Tobacco Control (see Fong, Cummings, & Shoptland, 2006). However, there remain very important promising lines of research aimed at improving stop-smoking interventions. Cancer Research UK is one of Britain's main sources of funding for medical research and it is putting substantial resources into smoking cessation research. A major part of this research is a programme grant that funds a team of researchers at the Health Behaviour Research

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Centre (HBRC) housed in the Department of Epidemiology and Public Health at University College London.

### The HBRC smoking cessation programme

This research programme covers a wide range of methods but with one primary goal: to reduce suffering and premature death by finding better ways of motivating and assisting smokers to stop. However, it is also intended that the research should contribute to our understanding of behaviour change processes more generally. The programme is not directly concerned with preventing take-up of smoking because, while that is very important, there are other teams around the world who are better placed to follow that line of research.

*The 3Ts framework for smoking cessation:* A simple conceptual framework underpinning efforts to promote smoking cessation embodies three key elements of change designated as the 3 Ts (West & Sohal, 2006): Tension, Triggers, and Treatment (Figure 1).

Interventions may address one or more elements of this model. This framework provides the basis for the HBRC research programme. The remainder of this paper describes just three of the research questions that are being addressed. The first two

### Table 2: What is known about encouraging and helping smokers to stop (see West, 2006; West, 2006b)

- ▶ Price rises, mass media campaigns, smoke-free legislation and advice from a doctor all have a significant impact in encouraging smokers to try to stop
- ▶ Nicotine replacement therapy (NRT) in the form of transdermal patches, chewing gum, lozenges, nasal spray, and an inhaler helps between 1 in 20 and 1 in 10 of those using them to stop long term who would not have stopped otherwise
- ▶ The antidepressants bupropion and nortriptyline help approximately the same number as NRT.
- ▶ The nicotinic partial agonist, varenicline, helps somewhat more people
- ▶ Advice and assistance from a trained specialist, individually or in groups, helps about 1 in 20
- ▶ Personalised advice and assistance delivered by an automated website can probably help between 1 in 40 and 1 in 10
- ▶ Written self help materials can help about 1 in 100

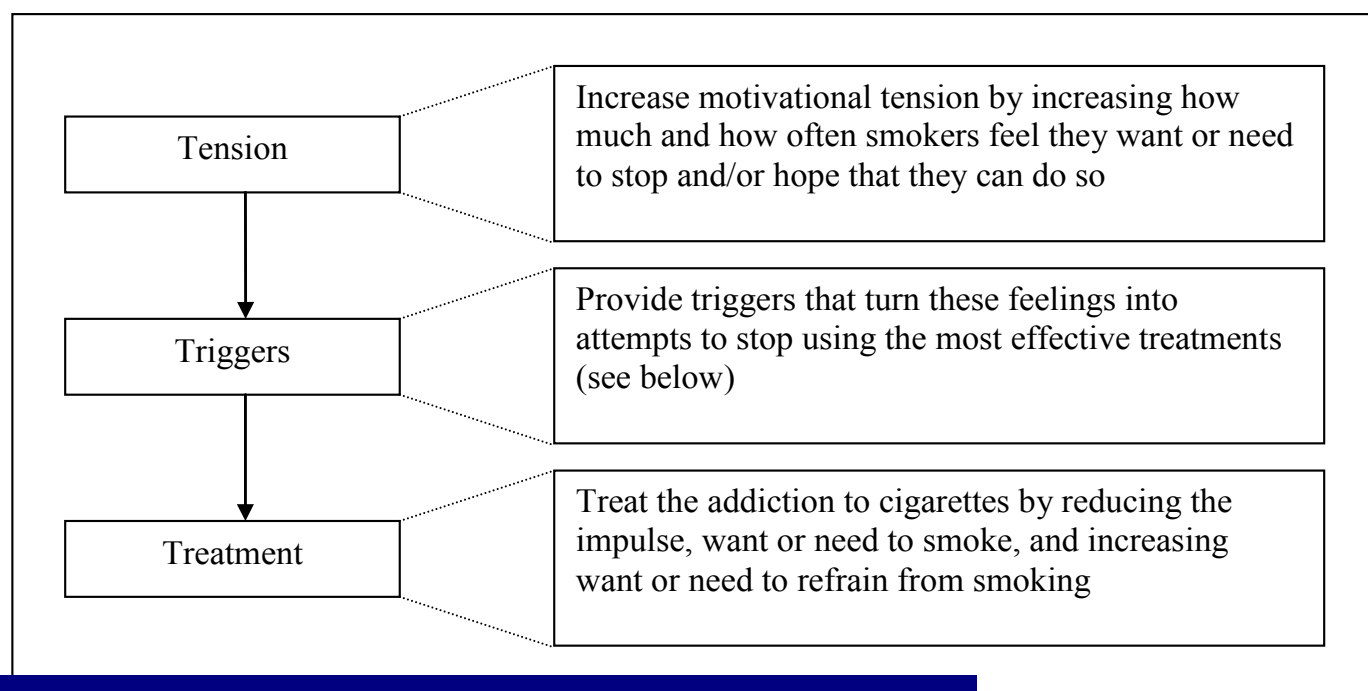


Figure 1: The 3Ts framework for promoting smoking cessation



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## Box 1

**PRIME Theory** focuses on the moment-to-moment control of behaviour through the strongest of competing impulses and inhibitions. These are generated 1) directly by internal or external stimuli acting on learned and unlearned dispositions (what one can term 'habit' and 'instinct'), and 2) indirectly by the strongest of any present feelings of 'want' (involving anticipated pleasure or satisfaction) and 'need' (anticipated relief). It argues that 'evaluations' (beliefs about what is good or bad etc.) can only influence behaviour through wants or needs. It notes that plans are formed when wants or needs motivate the idea of action to be taken in the future. For plans to have any effect on behaviour they must be remembered and generate wants or needs that are strong enough to overcome wants, needs, impulses or inhibitions arising from the immediate situation.

PRIME Theory notes that all behaviour is reactive 'in the moment' to internal or external stimuli and it delineates ways in which dispositions to generate plans, evaluations, wants, needs, and impulses and inhibitions change over time and in response to experiences. It argues that the dynamics of the process of change broadly follow the tenets of chaos theory, involving a mixture of stability and apparently chaotic switching of states in response to what are often minor fluctuations in influences. It also argues that 'identity' is a major source of wants and needs, and identity change is a major factor underpinning behaviour change. See [www.primetheory.com](http://www.primetheory.com)

concern all three elements of the 3Ts framework while the third addresses just treatment.

*1. What are the causal pathways leading smokers ultimately to succeed at stopping?* A popular model of the process of behaviour change, the Transtheoretical Model (TTM), has been found to be descriptively inaccurate and no better at predicting behaviour change than simpler models of motivation and addiction (Sutton, 2001; West, 2005, 2006c). Systematic reviews of interventions based on the TTM have not found these to be better than other forms of intervention in changing behaviour (e.g. Riemsma *et al.*, 2003).

Our research aims to advance the theory of behaviour change by developing and testing predictions from a theory of motivation, PRIME Theory, that seeks to encapsulate, in the simplest possible model, the breadth of understanding embodied in everyday language and the strong elements of existing formal theories (West, 2006a). The research involves qualitative studies, surveys, longitudinal studies and experimental tests of predictions. Box 1 briefly outlines key aspects of the theory.

PRIME Theory makes a number of specific predictions that differ from those from the TTM. One is that more smokers will quit if health professionals enthusiastically offer help to all comers and do not ask them first whether they are interested in stopping smoking. It also predicts that assessing how much smokers want to stop will significantly enhance prediction of quit attempts over and above assessment of intention to stop. A third prediction is that many successful quit attempts will be made without pre-planning because of a 'chaotic switch' in the

motivational system (a kind of 'epiphany') which suddenly makes 'not smoking' part of the person's core identity. A fourth prediction concerns the role of identity in maintaining behaviour change. It argues that a 'self-sealing tyre' type of identity about the new behaviour, with a clear boundary around it whose integrity is preserved after violations, will be essential for lasting behaviour change. This identity is contrasted with, to continue the metaphor, a 'balloon' identity that has a clear boundary but when punctured deflates entirely, or a 'leaky tyre' which does not have a clear boundary.

It is hoped that ideas from PRIME Theory will contribute to all three elements within the 3Ts framework by helping tailor mass media communications, improving the efficiency of clinician advice, and improving the effectiveness of psychological aids to cessation.

*2. How do key population smoking cessation parameters (rate of attempts to stop smoking, use of aids to cessation such as nicotine replacement therapy, and success of attempts to stop smoking) respond to events, including societal interventions (e.g. the introduction of smoke-free legislation), campaigns (e.g. No Smoking Day) and calendar dates (such as New Year's day)?* To answer this question we survey the adult population of England<sup>1</sup> every month and we follow up the smokers and recent ex-smokers 3 and 6 months after the initial contact. This 'Smoking Toolkit Study' (STS), is the first such study of its kind in the world. It has been going since November 2006. Table 3 lists some of the key findings of the STS to date. ►

<sup>1</sup> The study is restricted to England due to resource constraints

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This study should contribute to all three elements of the 3Ts framework by assessing how far policy initiatives such as smoke-free legislation generate motivational tension and trigger or aid cessation, by looking at what drives usage of different cessation aids and also by examining the real world effectiveness of these treatments.

**Table 3: Some early findings from the Smoking Toolkit Study**

(for more information: [www.smokinginengland.info](http://www.smokinginengland.info))

- ▶ Almost 50% of smokers made at least one quit attempt in 2007
- ▶ Approximately 40% of quit attempts involved use of nicotine replacement therapy, mostly bought 'over-the-counter' rather than obtained on prescription
- ▶ Approximately 50% of quit attempts are made spontaneously and not planned in advance; these appear to be more likely to succeed than those that are planned.
- ▶ Smokers in lower social grades try to stop and use treatments to help them stop at the same rate as those in higher grades but are less likely to succeed
- ▶ The New Year period and the introduction of smoke-free legislation in July appears to have increased not just the rate at which smokers try to stop but also the short-term success rates
- ▶ No Smoking Day appears to trigger about 100,000 smokers to try to stop
- ▶ Approximately 60% of smokers are trying to cut down at any one time of whom about 25% are using NRT to help them. Those who cut down are much more likely to try to quit
- ▶ Approximately 40% of quit attempts are made by gradual reduction. These are less likely to succeed in the short-term than abrupt quits unless the smokers uses NRT
- ▶ Approximately 15% of smokers regularly use NRT in situations where they cannot smoke and these are much more likely to make quit attempts
- ▶ Raising the legal age for selling cigarettes from 16 to 18 has had no immediate effect on smoking prevalence or levels of consumption in smokers age 16 or 17

*3. Are there more effective and cost-effective clinical interventions to aid cessation?* The studies addressing this question are all aimed at the 'Treatment' element of the 3Ts framework.

In collaboration with colleagues at the Marie Curie Cancer Centre in Warsaw, Poland, we are conducting a major clinical trial of tablets containing cytisine as an aid to cessation. Cytisine is a partial-agonist acting on particular nicotinic acetylcholine receptors thought to be important to addiction that is produced by the laburnum plant (Etter, 2006). It has been licensed in central and eastern Europe for more than 40 years as a smoking cessation aid and there is evidence strongly suggesting that it is beneficial. However, no high quality clinical trials have been conducted and before it can be recommended for use such trials are needed. The major advantage of this compound is that it is extremely cheap to produce and a full course of treatment could be sold for as little as £2, compared with up £50-£150 for existing treatments.

We are also undertaking development work on a device to enable smokers to get as much nicotine as they need relatively easily from a simple puffer. This device, known at the moment as the 'Nicotine Cannon', is a simply engineered mouthpiece that can hold five Nicorette inhalator cartridges at the same time with a system whereby the user can easily adjust the concentration of vapour inhaled. We are currently looking at how much nicotine smokers get from this device and how far it reduces their cigarette cravings. Pure nicotine in the doses obtained by smokers poses little or no harm to the health and a device such as this might prove a safe and effective tool for smokers wanting to stop.

We have developed a collaboration with a large number of smoking cessation services around England to provide data to inform best practice. We are investigating factors such how far the type of counselling and the skills of the individual counsellor makes a difference. Although most services are moving away from specialist advice provided by dedicated staff to smokers in groups, we have found this model of care to be associated with higher success rates than that now being offered, which is individual counselling by staff who do this as a small part of their healthcare role (McEwen, West, & McRobbie, 2006).

### Conclusions

There has been the space here to describe only ▶





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a small part of the work being undertaken. For the full programme see [www.ucl.ac.uk/hbrc](http://www.ucl.ac.uk/hbrc). It is in its early stages but we expect that by the end of the five year period we will have much better information on effective and cost-effective methods of motivating and assisting smoking cessation. We also hope to have a better understanding of how it is that smokers manage to achieve lasting cessation which can be fed into the further development of smoking cessation interventions. Such an understanding will hopefully have implications for behaviour change interventions more generally. ■

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*Disclosure: Robert West has undertaken research and consultancy for companies that develop and manufacture smoking cessation medications, including Pfizer, GSK, Novartis, Sanofi-Aventis and Johnson&Johnson.*

### An interview with Gaston Godin (continued from page 53)

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