Mind shift, mode shift: A lifestyle approach to reducing car ownership and use based on behavioural economics and social marketing

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Key words

mode shift: behavioural economics; social marketing

Abstract

This paper sets out a new approach to the Wicked Problems of obesity and climate change, and the linked and causative Wicked Problem of increasing car ownership and use. Policies to bring about modal shift from car dependence to forms of transport that cause lower emissions, and are less obesogenic, are conventionally based on framing car use as an externality to be addressed by policies such as taxation or regulation. These policies have been hampered by the reluctance of politicians and policymakers to countenance electoral risk by impinging on the individual's perceived right to personal mobility. This paper's approach combines insights and methods from behavioural economics and social marketing: it shifts the focus by considering car ownership and use not as an externality to be addressed in the aggregate, but as the product of individual behaviours and lifestyle choices. Behavioural economics can help to uncover the motivations, heuristics and cognitive biases behind such behaviours. Social marketing builds on the premise that people will only change their behaviour if they are sufficiently motivated to do so. It can be used to design interventions which help sectors of the population make transport choices that are more optimal – both for the individuals concerned and for all of us who are affected by these Wicked Problems.

INTRODUCTION

Imagine. It is 1876 and TV has already been invented. You are watching Dragons' Den, where investors decide whether to fund new ideas paraded in front of them by eager inventors. Into the Den strides one Nikolaus Otto, who says:

'I have invented an engine that can be dropped into today's horse-drawn vehicles to enable them, with an onboard source of fuel, to be self-propelled. The owner of such a machine will be able to go wherever he wants, whenever he wants. If we get the funding we need, I forecast that in about a century there will be 600 million of these vehicles in active use. This could grow to 1.5 billion by 2023,1 or 2 billion by 2030.²

The Dragons are reaching for their cheque books when one asks: 'Is there a downside?' Otto replies:

'By 2010 motor vehicles will kill around one and a half million people a year. Much of the countryside, and many towns and cities will be devoted to roads. These cars will damage the social fabric of communities and cause social isolation and urban sprawl. People will increasingly rely on their cars, contributing to a sedentary society and alarming increases in obesity, even amongst children. There will be noise and pollution, and the need to fuel these vehicles will dominate the foreign policy decisions of the major powers, leading to decisions that will cause the deaths of hundreds of thousands of people, and cost trillions of dollars. And emissions from such vehicles will be among the fastest growing sources of CO₂, a major contributor to the growing problem of global warming which will threaten all life on earth.'

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SAGE Publications ISSN 1757-9139 DOI: 10.1177/1757913909354151

The Dragons put their cheque books away, saying: 'No politician, planner or policymaker, let alone the public, is ever going to let this happen. Health ministers and environment ministers are going to ban it. The government's chief scientific advisors and chief medical advisors would have a fit. And can you image what the health and safety guys would say?'

Looking back from 2010 we now know that Otto developed his engine, Henry Ford invented the production line, and Asian manufacturers perfected the technology. We now have too many cars; we are using them too much; and they are damaging our health and our environment.

CLIMATE CHANGE, OBESITY AND CAR OVER-USE: LINKED AND WICKED PROBLEMS

Climate change and obesity could be seen as archetypal Wicked Problems.³ Not only that, but they are connected by a third Wicked Problem: increased car ownership and use. Adrian Davis and colleagues set out the linkage in their 2007 paper *Unfit for Purpose*.⁴ The diagram from the Royal Commission on Environmental Pollution⁵ illustrates the complex links and feedback loops attached to increased car ownership and use: it would be hard to find a better example of a Wicked Problem.

There is a vast literature on the need for alternatives to car domination and dependency. There is recognition of the damage caused by the excessive numbers of, and use of, cars. There is rhetoric from politicians, planners and policymakers that something has to be done. But progress is limited. There is an enormous gap between perceptions and action, as underlined by Anable *et al*, who surveyed the literature and stated:

'There is only a weak link between knowledge and awareness of climate change on the one hand and travel behaviour at the individual level on the other. Raising public awareness of this link is necessary, particularly to galvanize support for carbon abatement policy, but it is not

sufficient to change behaviour on its own. In order to effect change, many other factors need to be addressed – at the objective and subjective and at the individual and collective levels. These factors will be different for different travel behaviours and for different people. '6

It is recognition of this insight that prompts us to take a different approach: using social marketing and behavioural economics we start from the notion that, in order to improve conditions for society at large, it is necessary to find interventions that are capable of delivering clear and meaningful benefits for the individual.

WHAT HAPPENS WHEN WICKED PROBLEMS ARE TREATED AS EXTERNALITIES

Wicked Problems can be seen by economists as externalities: costs or benefits resulting from an economic transaction that are borne or received by parties not directly involved in the transaction. For example, a factory that causes air pollution imposes costs on those who breathe the polluted air, regardless of whether they work in the factory or purchase its output. Externalities typically mean that production and consumption of such goods is higher (or lower) than it should be, relative to the overall costs (or benefits) to society. Externalities are examples of market failures. Clearly some market failures are more important than others: they can even operate on a global scale. As Nicholas Stern noted, climate change is 'the largest market failure of all time.'7

Actions to internalize negative externalities normally need political intervention. Methods often use the price mechanism, sometimes based on what John Stuart Mill called 'sin taxes', such as taxes on tobacco, alcohol and congestion. Other approaches use regulation and legislation. Or policymakers can appeal to individuals to do things differently by using incentives and penalties: fines for not clearing up

after your dog; gift vouchers to give up smoking; pay as you throw schemes for rubbish disposal.

Such measures tend to be unpopular when implemented, but become generally accepted over time. But not measures to curb car use. Whether these take the form of increased car parking charges, congestion charging, road pricing, or practically any other form of restriction, these measures remain unpopular." Why is this? Our view is that politicians (and economists) who view over-use of the car as a Wicked Problem tend to see the consequences in terms of externalities. This generates a policy framework that spawns unpopular interventions focused on the effects of car use, rather than engaging with the reasons why people behave as they do. As such, interventions are so unpopular, that politicians retreat, and the externalities and symptoms continue unchecked. iii,iv

MORE PROBLEMS WITH EXTERNALITIES: THE TRAGEDY OF THE COMMONS AND THE CHALLENGE OF SPLIT INCENTIVES

The Tragedy of the Commons

Where an individual benefits from unlimited access to a finite resource, the unrestricted demand from that individual, when combined with others of similar intentions, can add up to doom the resource through over-exploitation. One example is over-fishing; another is treating the atmosphere as a commons, turning it into a sink for carbon discharges.

As Garret Hardin pointed out in *The* Tragedy of the Commons,8 freedom in a commons brings ultimate ruin to all. More recently, Jared Diamond has shown how the Easter Islanders sowed the seeds of their own destruction by chopping down all of the trees.9 He asks whether they would they have pursued their logging had they foreseen that extinction would follow. And have we learned the lesson? Hardin shows that the only way to prevent the tragedy of the commons is by agreement to coerce and regulate.8 Absent such agreement by lawmakers, car users will continue to see assets like road space or the



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atmosphere as a commons, with the Wicked consequences that will inevitably follow: more emissions, more climate change, more obesity.

The Challenge of Split Incentives

Another reason for the lack of political support for bringing about behavioural change, particularly when it relates to the environment, is caused by split incentives. These arise when the people and places that are affected by a particular action are distant from the people and places where the actions happen. To take one example, excessive CO₂ pollution in advanced countries is probably contributing to rising sea levels in South Asia. Apart from arguments based on morality, people in the advanced countries seem unwilling to give up the trappings of their affluent lifestyle in order to improve the prospects of people in distant lands whom they do not know and will probably never meet.

So although people may agree that further climatic change needs to be curtailed, they may be evidencing The Tragedy of the Commons (what I'm doing is just a drop in the ocean) and The Challenge of Split Incentives (why should I stop doing things when it won't be me that gets the benefits?).

For car users, split incentives mean that they are disconnected from the main problems caused by their vehicles, whether it is noise or pollution or congestion or danger, which are imposed on people whose communities they pass through. And it is hard to argue to the average Brit that not using the car will make much difference when there are around 30 million cars still on our roads, using up the commons.

Our approach, by contrast, is to show that the disbenefits of car use might have an impact not just on what is outside the car, but on who is inside it too. For this we need to change the focus of our analysis from the aggregate to the individual.

FROM MARKET FAILURE TO INDIVIDUAL BEHAVIOURS

Externalities can be tackled by addressing the individual behaviours that

create the problem, usually for specific groups: providing dedicated cycle paths for safe cycling to school; ensuring that schools have kitchens so that children can learn how to prepare fresh food; requiring that hospitals have travel plans for staff and patients. Another approach is based on providing information and education (sometimes known as 'tell and sell' or alternatively, 'spray and pray'). Examples include: smoking is bad for you; binge drinking harms your health; better to practise safe sex than be sorry.

But these techniques, which have informed public policy interventions over a lengthy period, are predicated on individuals responding to incentives in a rational and considered manner. Such rationality and deliberation cannot be assumed: incentives and penalties often fail to achieve expected outcomes. As lan Potter. Director of New Zealand's Health Sponsorship Council said in 2007: 'It would be easy to give the public information and hope they change behaviour but we know that doesn't work very satisfactorily. Otherwise none of us would be obese, none of us would smoke and none of us would drive like lunatics.'10 In fact, it is just as likely that attempts to change behaviour will stimulate the 3Rs of behaviour change: Resistance. Reluctance and Resentfulness.

In following sections we recognize the realpolitik of car ownership and use. We propose the use of a framework in which excessive car use is seen not as a Wicked Problem, the kind of externality that politicians are reluctant to address, but as an individual lifestyle choice. Our approach is not based on externalities, nor does it appeal to the individual's sense of altruism or ecology (although we recognize that these can be powerful motivators for some). Rather, we look at the impact of owning and using a car in terms of how it affects the owner and user of that car. The starting point is to recognize that the individual may have a flawed understanding of these effects. To illuminate this, we use insights that are now emerging from behavioural economics, which enable us to reconsider the balance of costs and benefits that accrue to individual car owners. We then consider how social

marketing can help to create interventions aimed at changing behaviour.

PUTTING HUMANS BACK INTO ECONOMICS

For most economists, the motivations that underlie individual behaviour are incorporated into a standard set of assumptions, so that they can move on to consider their real subject matter: what happens in the market. Economics has assumed that people are mechanistic agents who follow a given set of behavioural rules. As Nick Wilkinson¹¹ explains, the Standard Economic Model assumes that people are:

- Rational
- Motivated by expected utility maximization
- Governed by selfishness, and do not take into account the utility of others
- Bayesian probability operators
- Consistent with their time preferences according to their discounted utility
- Liable to treat all income and assets as fungible

In recent years, these frequently unrealistic assumptions about individual behaviour have been challenged by the emergence of behavioural economics. This is long overdue since, as the former editor of the *Economist* has written: 'Economics is not about models and mathematics, it is about behaviour: our reactions to opportunities, risks and fears.'12

AN OVERVIEW OF BEHAVIOURAL ECONOMICS

Behavioural economics is the study of how thinking and emotions affect individual economic decisions and the behaviour of markets. It typically integrates insights from psychology with neo-classical economic theory in order to better understand market decisions. The standard economic assumption that everyone in the economy is rational and selfish is replaced by the idea that some agents in the economy are not only human, but behave as such. The economics establishment conceded the value of this insight when, in 2002, a

Nobel Prize was awarded to the Princeton University psychologist Daniel Kahneman 'for having integrated insights from psychological research into economic science, especially concerning human judgement and decision-making under uncertainty.' As explained by two of its foremost exponents: 'Behavioural economics increases the explanatory power of economics by providing it with more realistic psychological foundations.'13 From a practical perspective, this means using research on human and social cognitive and emotional biases to better understand the rationality or lack of it, of decisions made by economic agents - you, me, and everyone else. Using behavioural economics enables us to recognize that: 'People live in difficult environments with poor information; they are prone to error, emotion, and self-interest, and often fail to maximize their own long-term best interests.'14

Once we know more about why people behave as they do, we will begin to understand what might be preventing them from reaching these optimal outcomes. When compounded with phenomena such as split incentives, The Tragedy of the Commons, and political hesitation, it is clear that an approach based on externalities may not be sufficient to modify the behaviours that cause Wicked Problems.

Were we to model human behaviour at the extremes, we would emerge with two archetypes: the rational deliberations of Homo economicus versus the more untidy reality of Homo sapiens. In caricature, the former is represented by Star Trek's Mr Spock, a rational deliberator who might have stepped from the pages of a standard economics textbook; at the other end of the spectrum is Homer Simpson, an intemperate but more realistic human, who sometimes makes the right choices, but often goofs. (Some of their behavioural characteristics are shown in Figure 1.)

Some of us (like Spock and Simpson) behave at the extremes all of the time; most of us, most of the time, behave somewhere in between (even economists). The challenge is to recognize when

cognitive and psychological biases that sometimes make us more like Simpson, prevent us from making optimal choices; and then reconcile these biases to the analytical rationality shown by Mr Spock.

FROM THEORY TO POLICY

The combination of economic analysis with psychological understanding is beginning to be used to inform both public policy and commercial activity. This has been helped by the rising profile of behavioural economics with the publication of books such as *Nudge*, *Predictably Irrational*, *Sway* and *Basic Instincts*. ^{15,16,17,18}

Policymakers recognize that most areas of public policy rely on the behaviour of individuals and their ability to make the right choices in order to achieve certain goals - ranging from functioning markets to sustainable consumption. The influence reaches to the highest levels: Michelle Obama has been influenced by Nudge, planting a recessionary Dig For Victory style vegetable garden at the White House soon after taking up residence. 19 This example was subsequently followed by the digging of an allotment at Buckingham Palace. There is a growing list of Nudge-type policies, with subjects ranging from pension plans to organ donations to healthier eating.

These are early days for behavioural economics as a policy tool, but there is significant scope for applying more of its insights to other areas. We next consider how we might apply some of these tools and techniques to consider the Wicked Problem of over-use of the car.

BEHAVIOURAL ECONOMICS AND USE OF THE CAR

Figure 2 provides a new framework for considering car ownership and use. No longer viewed as an externality, the Wicked Problem has been re-cast as a matter for the individual. This means thinking about car ownership and use not as an issue for society, but re-casting it at the level of the individual. In particular, what are the barriers that can prevent the individual reaching a full understanding of the balance between

the costs and benefits of their actions? This framework gives us the following elements:

- It is about the individual: not society
- It is about costs and benefits, and potentially living better: not making a sacrifice
- It is about thinking differently: is car ownership the best solution for my travel needs?
- It is about changing the default: think 'go car-free', not automatically 'own a car'

We examine heuristics and other aspects of behavioural economics in more detail in the following section. Before we do so, we return to Messrs Spock and Simpson to caricature what some of these heuristics might be when it comes to owning and using a car (Figure 3).

Figure 4 shows how we can use insights derived from behavioural economics to illustrate the systematic biases that influence our behaviour. It shows how these psychological factors, cognitive biases and heuristics can be applied to the ownership and (over-)use of cars.

WHERE DOES SOCIAL MARKETING FIT?

Having identified some of the conscious and unconscious motivations that stand in the way of getting people out of their cars, how can we operationalize these insights and use them to change behaviour? Social marketing provides a way to understand individual motivations and then devise behavioural interventions that respond to these motivations. The rationale for this approach, which uses methods from commercial marketing, is captured in the title of Gerard Hasting's book Social Marketing: Why Should The Devil Have All The Best Tunes?²⁰

From our perspective, social marketing complements the understanding and insights derived from behavioural economics. It then uses such insights as a platform for interventions.

Social marketing, with its methods of customer orientation and audience segmentation, recognizes the truth inherent in behavioural economics – that



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society comprises a few Spocks, many Simpsons, and a whole lot more who fall in between. This means that interventions need to be based on a clear segmentation of the audience, offering different strokes for different folks: people only change behaviour if they are motivated to do so, and different people have different motivations and different biases that cause or prevent such behaviours. There have been examples of successful interventions that use social marketing to generate modal shift. These include Worcestershire County Council's Choose How You Move campaign, which ran from April 2004 to March 2009;²¹ and the TravelSmart programme in Perth, Western Australia.²² Others include the EU's Max Travel Awareness programme,²³ Barr et al's Promoting Sustainable Travel: A Social Marketing Approach²⁴ and Doug MacKenzie-Mohr's work on car-sharing schemes.²⁵

These examples are still the exception rather than the rule when it comes to interventions to cut car use: the default still seems to be the use of legislation, taxation or regulation, or appeals to improve the common good. Such interventions largely ignore the different motivations of different segments of the audience – some people might want to be more green, but others are more interested in saving money, looking good, or reducing stress – successful interventions need to use this as the starting point.

CONCLUSIONS

One commentator has reported: 'Some even argue that the convergence of insights from social marketing, neuroscience and behavioural economics forms the basis for a new paradigm for social change.'26 For present purposes, we confine ourselves to social marketing and behavioural economics (while recognizing that insights from neuroscience are increasingly being incorporated into the analyses of both). In the meantime, we hope this paper will start a debate about how these two disciplines, together, can provide the basis for more focused and more powerful interventions to help mitigate the Wicked Problems of climate change and obesity.

Figure 1

Two kinds of behaviour: Mr Spock and Homer Simpson

Reflective: Homo economicus (Spock)	Automatic: Homo sapiens (Simpson)	
 Rational Controlled Effortful Deductive Slow Self-aware Rule-following Conscious thought Your second language 'This turbulence is bad. However, planes are a safe way to travel' 	 Intuitive Uncontrolled Effortless Associative Fast Unconscious Skilled Gut reaction Your native language 'This turbulence is bad. We're all going to die' 	

Figure 2

A Wicked Problem: Reframed

Re-Framing a Wicked Problem
It's not an externality: it's your car vs you

	it of for all externality. It o your oar vo you
Define the problem	Climate change Too many cars etc
Analyse the situation	Impact of car ownership - on the individual owner (not the world) Your car costs you money, health, time, etc It's individual behaviour
Prescribe the solution	Use your car less (or give it up) because it's better for you Re-frame the choices, change the zeitgeist New choice architecture Change the default
	Changed awareness

Behaviour change? It's cool to be carfree...

Figure 3

Mr Spock and Homer Simpson on car ownership and use

New role models

Mr Spock on car ownership

Sees the real (normally unperceived) costs as well as the benefits of owning a car:

- Can be convenient (could hire one!)
- Will likely make me fat (use it less)
- Could make me unfit (use it less)
- Will consume a lot of my (total) time
- Costs a lot (maybe x days per week to pay for it)
- May kill me or someone else
- No connection to my image or status
- Use the car sparingly, it's damaging the planet (Spock probably knows about *The Challenge Of Split Incentives*)

Homer Simpson on car ownership

Sees the real (and perceived) benefits, and discounts the costs of a car. Has his own set of heuristics about car owning:

- It's convenient
- Nothing to do with my weight
- Nothing to do with my health
- Saves me time
- Cheaper than the alternatives
- Safe
- Enhances my status
- What difference does one more car make? (not familiar with The Tragedy of the Commons)

Figure 4

Some concepts from behavioural economics applied to car ownership

Concept from behavioural economics	Explanation of concept	Example	Applied to car owning and use	Applied to reposition car owning and use
Framing	People are sensitive to the <i>framing</i> , or formulation, of the decision problem. The presentation of the data is as important as the data itself	Consumers are greatly influenced in their decisions by how choices and options are presented to them – a fact that industry has been taking advantage of for years	'Although I know my car is probably bad for the planet, I didn't know it probably isn't good for me'	Car owning and use is not just about the impact on society and environment; it's about living a better life, not by making a sacrifice but because the personal costs of car owning may outweigh the benefits – is owning a car good for the car owner?
Choice architecture	Choice architecture can restructure things so that it is easier to make optimal choices	It is often difficult to find out about alternatives to using a car	'I don't even think about it; I just jump in the car'	Provide better transport information and make it accessible via broadband and mobile phones, using technology such as GPS, real-time indicator boards
Defaults	If the default is set right, the individual does not need to make the the right choice	Public transport seems more difficult and inconvenient than jumping in the car	'I don't even think about it – I own a car, rather than think about optimal choices for journeys I make'	Change the default: don't automatically own a car; could car-free be a better option?
Salience and sunk costs	Paying cash now is painful If the cost is already incurred, you might as well forget about it	Train and bus tickets are expensive compared with the cost of the petrol for each car journey	'Public transport is expensive. My car cost a lot to buy, but now I've got it, I'll use it'	Start thinking about how much it costs to own and run a car. A car owner is generally £000s worse off than a non-car owner
Hyperbolic discounting: intention vs action	Freedom and convenience is now; disbenefits are incremental, cumulative and far off	The cost of an unhealthy lifestyle is in the future – the pleasures are here and now	'Soon I'll drive less; right now, I'll jump in the car'	Policies need to provide some of the benefits of changing lifestyle in the present. ²⁸ People need help to make commitments and stick to them
Status quo bias	Keep on doing it, unless there are massive incentives to change	Even if the costs of making a change are low and the benefits are high, people often choose to be 'inert' or do nothing rather than actively make a change	'I automatically use the car – what's to think about?'	Make it easier to give up car ownership and use. Join a carclub; hire a car when needed
Optimism bias	We persistently overestimate the likelihood of positive events and underestimate the likelihood of negative events	Overconfidence makes us overestimate our own logic, discipline and/or abilities; heavily exploited in the marketing world	'This journey only takes me n minutes by car. I'm a better than average driver'	Do people count all of the time spent looking after the car and keeping it on the road? Time spent parking on each journey? Everyone thinks they are better than average: this cannot be valid

An extended version of this table is available on application to the corresponding author.



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We recognize that political interventions based on the need to internalize externalities, while necessary, are increasingly jeopardized by the unpopularity of such measures. We contend that individuals often make choices about car ownership and use that are not only not optimal for society, but are not optimal for the individuals themselves. Hence, our focus is on the behaviours of individuals when they

make choices about their personal transport.

These themes underlie the approach of the website www.GiveUpYourCar.com and will be further explored and developed in a forthcoming book The *Car Addiction*.²⁷ This book will synthesize the conceptual frameworks, analytical methods and behavioural insights from behavioural economics and social marketing, and apply them to car ownership.

Perhaps, for the moment, we should leave the last word to Mr Spock, who, in spite of his rationalism, exemplifies the challenge for those seeking to change behaviours:

Gillian: Are you sure you won't change

your mind?

Spock: Is there something wrong with

the one I have?

Star Trek: The Voyage Home

Notes

- i Heuristics are shortcuts or 'rules of thumb' often used unconsciously when we make decisions. The idea was first mentioned by Tversky and Kahneman in 1974.²⁹ They considered three heuristics: (i) Representativeness: decisions are made on likeness to previous outcomes; (ii) Availability: the likelihood of an event is assessed by the ease with which it can be recalled; (iii) Adjustment/anchoring: people make judgements based on having a reference point (where they start from).
- There are some exceptions, such as pedestrianization schemes, often subject to fierce initial resistance, but later embraced by their communities; we may be approaching a similar tipping point for 20 mph speed limits in urban areas.
- iii Examples in the UK have included Gordon Brown's decision as Chancellor of the Exchequer not to implement the 'fuel price escalator' in 2000, following widespread public protests; more recently, a 2008 referendum in
- which citizens voted 4:1 to oppose a congestion charge in Manchester.
- iv Politicians' aversion to such measures is likely to have been exacerbated by the move of political parties toward the middle ground, which has produced a deference to opinion polls and focus groups. In addition, politics is now as much a career choice as a matter of ideological conviction: not rocking the boat has become imperative. (For more on this see Oborne.³⁰)

References

- 1 FIA Foundation for the Automobile, AA Motoring Trust. The Automobile and Society. London: FIA Foundation for the Automobile, 2003. Available at: http://www.iam.org.uk/IAM+Policy+ and+Research/Reports/TransportPolicy.htm (accessed 21 October 2009)
- Sperling D, Gordon D. Two Billion Cars: Transforming a Culture. Oxford: Oxford University Press, 2009
- 3 Rittel HWJ, Webber MM. Dilemmas in a general theory of planning. *Policy Sciences* 1973; 4: 155–169
- 4 Davis A, Valsecchi C, Fergusson M. Unfit for Purpose: How Car Use Fuels Climate Change and Obesity. London: Institute for European Environmental Policy, 2007
- 5 Figure 1-1, p 7. Royal Commission on Environmental Pollution: Twenty Sixth Report: The urban Environment. London: Royal Commission on Environmental Pollution, 2007.
- 6 Anable J, Lane B, Kelay T. An Evidence Base Review of Public Attitudes to Climate Change and Transport Behaviour. London: Department for Transport, 2006. Available at: http://www.yhub.org.uk/resources/Climate%20C hange%20Micro%20Site/publicattitudes-CCandtransportbehaviour.pdf (accessed 21 October 2009)
- 7 Stern N. (2006) The Economics of Climate Change. London: HM Treasury, 2006
- 8 Hardin G. The Tragedy of the Commons. Science 1968; 3859: 1243–1248. Available at: http://www.sciencemag.org/cgi/content/full/162/ 3859/1243 (accessed 21 October 2009)
- 9 Diamond J. Collapse: How Societies Choose to Fail or Survive. London: Penguin, 2006

- 10 Potter I. Director, New Zealand Health Sponsorship Council. New Zealand Herald, June 2007
- 11 Wilkinson N. An Introduction to Behavioural Economics. Basingstoke: Palgrave MacMillan,
- 12 Bill Emmott. Writing in the *Guardian*, 3 January 2009
- 13 Camerer C, Loewenstein G. Behavioural Economics: Past, Present, Future. In: Camerer C, Loewenstein G, Rabin M, editors. Advances in Behavioural Economics (p.3). Princeton: Princeton University Press, 2003
- 14 Rothschild ML. A Few Behavioural Economic Insights for Social Marketeers. Social Marketing Quarterly 2001; 3: 9–13
- 15 Ariely D. Predictably Irrational. London: Harper Collins, 2008
- 16 Braffman O, Braffman R. Sway: The Irresistible Pull of Irrational Behaviour. London: Virgin Books, 2009
- 17 Lunn P. Basic Instincts: Human Nature and the New Economics. London: Marshall Cavendish, 2008
- 18 Thaler R, Sunstein C. Nudge: Improving Decisions about Health, Wealth and Happiness. London: Penguin, 2009
- 19 The White House. Spring Gardening. Available at: http://www.whitehouse.gov/blog/09/03/20/ spring-gardening (accessed 21 October 2009)
- 20 Hastings G. Social Marketing: Why Should the Devil Have All the Best Tunes? London: Butterworth-Heinemann, 2007
- 21 National Social Marketing Centre. Choose How You Move. Available at: http://www.nsms.org.uk/

- public/CSView.aspx?casestudy=68 (accessed 21 October 2009)
- 22 Government of Western Australia, Department of Transport. Why be TravelSmart? Available at: http://www.transport.wa.gov.au/travelsmart/1495 4.asp (accessed 21 October 2009)
- 23 MAX. Successful Travel Awareness Campaigns & Mobility Management Strategies. Final Conference. Available at: http://www.max-success.eu/ (accessed 21 October 2009)
- 24 Barr S. Promoting Sustainable Travel: A Social Marketing Approach. Available at: http://www.esrcsocietytoday.ac.uk/ESRCInfoCen tre/ViewAwardPage.aspx?ts=3&data=v9XrjLJ6xh FzgKlC6CSMZDz7dlfrSRcMp5s1PCEXnku7C4Cl 9lXeAw%3D%3D (accessed 21 October 2009)
- 25 McKenzie-Mohr D. Fostering sustainable behavior through community-based social marketing. American Psychologist 2000; 5: 531–537
- 26 Lefebvres C. Commenting on Alan Milburn's speech at the World Social Marketing Conference in Brighton, September 2008. Available at: http://socialmarketing.blogs.com/ r_craiig_lefebvres_social/2008/10/social-marketing-hard-power-and-soft-power-in-socialchange.html (accessed 21 October 2009)
- 27 Information available at: www.thecaraddiction. com (accessed 21 October 2009)
- 28 LeGrand J. Cited in: Cash incentives seen as helping nation's health. *Financial Times*, 11 April 2009
- 29 Tversky A, Kahneman D. Judgment under uncertainty: Heuristics and biases. Science, New Series 1974; 4157: 1124–1131
- 30 Oborne P. The Triumph of the Political Class. London: Simon & Schuster, 2007

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