

# Theory + cycling + people + data = measurable changes in people's cycling behaviour

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## Abstract

Promoting cycling is important for individual health, environmental sustainability and transport demand management. However, few people use a bicycle on a regular basis if at all in the last 12 months. This paper explores the idea of incorporating behaviour change theories with more traditional marketing approaches in order to capture three groups of cyclists; novice, occasional and regular. Those who have had the least experience cycling in the last 12 months are 'novice cyclists', and are the focus of this paper. The impact of a Workplace Cycle Challenge on this group is explored using both a qualitative and quantitative model. Results from 18 Challenges in 2010 is evaluated and compared with the Edinburgh Cycle Challenge 2010. Conclusions are drawn on the success of the Edinburgh Cycle Challenge and the theories it encapsulates. A brief scope is provided for opportunity to implement this unique model nationwide and globally.

**Keywords:** *Cycling, Bicycling, Behaviour Change, Intention.*

## 1. Introduction

We all know we should be incorporating a behaviour change theory approach into the programmes we run to promote sustainable transport. With many of these programmes being designed by people who aren't behaviour change experts, what are the key theories and considerations to keep in mind? This paper will outline three key behaviour change theories and provide a practical example of how they can be applied and appropriately evaluated.

The key case study and piece of research that will be discussed is the Workplace Cycle Challenge programme – a best practice behaviour change intervention that has proven to be highly effective at encouraging more people to cycle for transport trips. More than 50,000 people and 2,100 organisations have taken part in the 28 programmes that CTC Challenge for Change has run across the UK, Australia and New Zealand. The Edinburgh Workplace Cycle Challenge in 2010 was the first Challenge of its kind in Scotland. The data from the Scotland Challenge will be compared and discussed with that of the other Challenge programmes implemented in 2010.

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Although it is called a ‘Workplace Cycle Challenge’, the cycle trips that are logged do not necessarily have to encompass trips to work, or part of the way to work. The model looks to encourage workplaces to compete against each other with the number of cycle trips that are logged within the ‘Challenge’ period, which normally lasts three weeks. Workplace Cycle Challenges are typically funded by local authorities or public bodies who are keen to gain the benefits that getting more people cycling brings. This is to meet both CO<sub>2</sub> targets set out by central government and to encourage residents to incorporate a healthier and more sustainable lifestyle.

The Workplace Cycle Challenge incorporates principles of social marketing, commercial marketing and behavioural change theory. As each Challenge project has specific aims and objectives that need to be met in relation to sustainable transport, health and/or climate change; each programme is tailored to the local area while simultaneously ensuring consistent grounding in its proven model and the fundamental theories of behaviour change it incorporates.

The Challenge programme has been highly successful with an average of 37% of ‘novice cyclist’ participants continuing to cycle each week as recorded in the three month post Challenge surveys and 22% of ‘occasional cyclist’ participants cycling regularly to work (2-3 days or 4+ days a week).

## **2. Behavioural change theories**

What differentiates Challenge for Change’s Workplace Cycle Challenge from other cycle promotion initiatives is that it has merged a number of socio-psychological theories coupled with support from an individual’s peers and an element of competition. The key behaviour change theories that the Challenge programmes utilised include:

- **Self-perception theory** – An understanding that peoples own experience of a behaviour or habit will give them their strongest perceptions of that behaviour. Providing a positive cycling experience to an individual is an ideal way to efficiently and convincingly give that person positive perceptions towards cycling. These “positive expectancies and values generally had the anticipated effects, increasing goal commitment” (Ajzen, 1996: 31).
- **Self-efficacy** – An understanding of what people perceive they are able to do or achieve (see Luszczynska and Schwarzer, 2005; Bandura, 1997; Bandura, 1977). Self-efficacy is in some ways like self-confidence except it focuses on a particular behaviour. It can be compared with normative models of attitude and environmental behaviours, particularly Ajzen’s Theory of Planned Behaviour (1991) whereby social behaviour is under the individual’s conscious control.

- **Social cognitive theory (previously social learning theory)** – Applied to areas as diverse as school achievement to socio-political change (Luszczynska and Schwarzer, 2005). A sense of control on one’s actions is a key concept in this theory, because if people “believe that they can take action to solve a problem instrumentally, they become more inclined to do so and feel more committed to the decision” (Luszczynska and Schwarzer, 2005: 128). Behaviour is determined by expectations and incentives, whereby incentives are defined as “the value of a particular object or outcome” (Rosenstock *et al.*, 1988). Expectations can include notions around one’s own competence to perform a behaviour which links back to the self-efficacy theory (Rosenstock *et al.*, 1988). If people observe positive desired outcomes, they are more likely to adopt the behaviour themselves. For example if people see their colleagues and peers being positively and publicly rewarded for cycling, this will increase their likelihood of taking up cycling themselves.

Moreover other theories are employed based on social marketing, whereby identifying that most behaviours can be broken down into a series of sub-behaviours that need to be carried out, in order to complete the main behaviour. Each of these sub-behaviours has its own perceived barriers and benefits to completion. These need to be identified and addressed in order to encourage people to implement the main behaviour.

If we were to take cycling as an example, we can break down the behavior that we want to achieve of encouraging someone to take up cycling into a number of sub-behaviours. These including gaining access to a functioning bike, having the bike set up appropriately for them, learning how to ride the bike, and finding cycle routes that they are happy cycle on. We can then look at the barriers and benefits that individuals perceive towards each of these sub-behaviours and take steps and implement measures to address each one.

### **3. Workplace Cycle Challenge**

A Workplace Cycle Challenge is essentially a fun competition between organisations to see which can get the most employees to ride a bike. In each size category, the organisation or department that motivates the highest percentage of staff to cycle wins a team prize. Staff only have to ride a bike for ten minutes or more for their participation to count towards the Challenge. They can ride wherever they feel comfortable and whenever they like over the two or three week Challenge period.

A Workplace Cycle Challenge is an ideal way to introduce more people to cycling. Instead of promoting cycling through traditional methods, such as advertising and information on the benefits of cycling, a significantly more effective form of marketing is to get people to actually experience what it is like to ride a bike.

There are three objectives of the Challenge:

1. To encourage non-cyclists to take up and continue cycling
2. To encourage people who are already cycling to cycle more often
3. To encourage people to cycle for transport purposes, especially to work

### 3.1 Concept

Giving people a fun ten-minute cycling experience quickly breaks down negative perceptions about cycling, and replaces them with new, more positive attitudes. When people experience what cycling is actually like (as opposed to what they assume it is like) they often find themselves saying:

*“Hey, this isn’t so bad after all. Cycling isn’t as scary or as hard as I thought. It’s actually quite easy to ride a bike, and it’s fun!”*

Giving people this positive cycling experience is an ideal first step to encouraging more people to start cycling.

### 3.2 Audience segmentation

Challenge participants are captured and placed into three broad categories based on their cycling behaviour prior to the start of the Cycle Challenge. Answers provided to the question “How often have you cycled in the last 12 months?” determine what category participants will be put in. These segments I have specified are as follows:

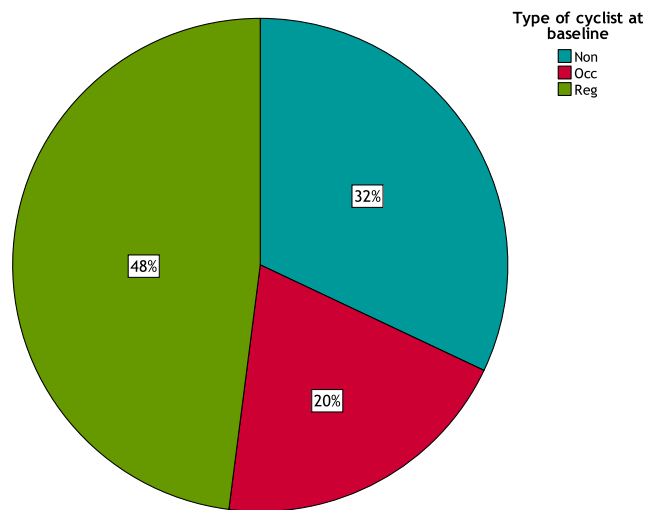
- **Novice cyclists** – those people who before taking part in the Challenges either had said that they cycled “*not at all*” or “*a few times*” in the previous 12 months.
- **Occasional cyclists** – those people who before taking part in the Challenges had either cycled “*1-3 times a month*” or “*once a week*” in the previous 12 months.
- **Regular cyclists** – those people who before taking part in the Challenges had cycled “*2-3 days a week*” or “*4 or more days per week*” in the previous 12 months.

Three months after the Challenge participants are again asked a similar question; “*How often have you cycled in the last 3 months?*”. The answers provided allow us to measure changes in an individual’s cycling behavior prior to the start of the Cycle Challenge and three months after.

### 3.3 Results

The 'Workplace Cycle Challenge' programme has achieved consistent results in getting more people cycling in each area it has been implemented. Overall, the programme attracts similar proportions of each audience group – novice, occasional and regular cyclists. Please see Figure 1 for more details.

**Figure 1. Pie graph to show cycling behavior of Challenge participants at registration**



Figures 2 and 3 compare baseline cycling behaviour with that post Challenge. In general, 57% of all novice cyclists were now classed as occasional or regular cyclists. In addition to this, 39% of occasional cyclists are now classed as regular cyclists. The positive impact is measurable across all groups of individuals. Furthermore, 37% of novice cyclists at baseline are now cycling once a week or more.

**Figure 2. Table to show change in cycling frequency at registration and 3 months post Challenge**

Cycling frequency 3 months after	Cycling frequency at registration					
	Not at all	A few times	1-3 times a month	Once a week	2-3 days a week	4 or more days a week
	N=661	N=783	N=571	N=542	N=884	N=1887
	%	%	%	%	%	%
4 or more days a week	9%	9%	10%	13%	26%	86%
2-3 days a week	12%	14%	25%	34%	52%	11%
Once a week	11%	17%	21%	29%	12%	2%
1-3 times a month	19%	23%	26%	17%	5%	1%
1-2 times	28%	25%	15%	6%	3%	0%
Not at all	20%	10%	2%	1%	1%	0%
Total	100%	100%	100%	100%	100%	100%

**Figure 3. Table to show cycling frequencies categorised at registration and 3 months**

Cycling frequency after 3 months	Cycling frequency at registration		
	Novice	Occasional	Regular
	%	%	%
Regular	21%	39%	90%
Occasional	36%	49%	8%
Novice	43%	12%	2%
Total	100%	100%	100%

On average, 61% of novice cyclists at baseline consider themselves to be cycling more often now than the 3 months prior to the Challenge. Figure 4 explores the common themes that have been touched upon as the reasons for the change.

**Figure 4. Table to show general feedback themes echoed by participants who are now cycling once a week or more**

Novice cyclists at registration now cycling:	Reasons for positive change (n=227)
Once a week or more post Challenge	<ul style="list-style-type: none"> <li>▪ <i>“I want to say thank you so much as we all got involved and I was given a loan of a bike and had others help me to learn to ride and now I own a bike and am more active and can spend time with my children who could already ride so my life has improved and it was all thanks to this challenge.” Greater Manchester participant</i></li> <li>▪ <i>“Since a colleague urged me on to do some cycling I have succeeded in getting friends to join me and in turn they have encouraged their friends to get on their bikes. It just keeps on going.” Leicester participant</i></li> <li>▪ <i>“It motivates people because it's a challenge. The biggest challenge is when you go it alone after.” Southampton participant</i></li> <li>▪ <i>“Its reminded me how much fun it is again - thank you.” Cambridge</i></li> <li>▪ <i>“Really pleased to have rediscovered cycling!” Milton Keynes participant</i></li> <li>▪ <i>“Thank you for the opportunity to experience and rediscover a fun and healthy pass time that I had forgot and left in my childhood.” Darlington participant</i></li> <li>▪ <i>“The Challenge was good at getting people back on bikes as it gave a purpose and so team spirit within the company.” Isle of Wight participant</i></li> <li>▪ <i>“Was good, you should do it again!” Oxford participant</i></li> <li>▪ <i>“I think it would encourage more new starters to try it if there was a cycling buddy scheme similar to lift share I know a lot of people are really nervous about riding on roads or in the dark alone.” TravelWise Merseyside participant</i></li> <li>▪ <i>“I thought the Challenge was an excellent way of encouraging people to try cycling. It certainly gave me the incentive to try after not riding for a number of years.” Chichester participant</i></li> <li>▪ <i>“Helped to increase confidence on busy roads.” Edinburgh participant</i></li> </ul>

### 3.4 Edinburgh results

Seventy-two percent (72%) of novice cyclist at baseline state that they are now cycling more than they did compared to 3 months prior to the Challenge. This is higher than the 57% average achieved across all sites. With 35% of novice cyclists at baseline now considered regular cyclists, this is also significantly higher than the national average of 21%. These results are shown on Figure 5.

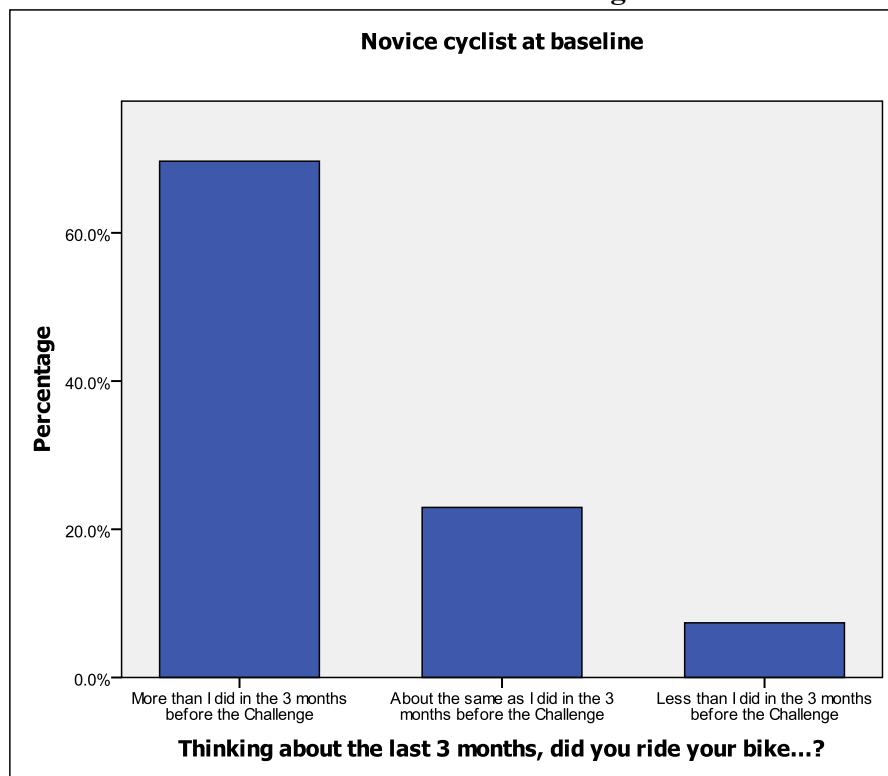
**Figure 5. Table to show cycling frequencies categorised at registration and 3 months later**

Edinburgh			
Category 3 months post Challenge	Category at registration		
	Novice	Occasional	Regular
	%	%	%
Regular	35%	58%	93%
Occasional	37%	28%	6%
Novice	28%	14%	0%

Participants are also asked what their perceptions are of their cycling behaviour 3 months after the Challenge. This allows us to compare perceptions with actual behaviour, and to assess how efficient the relevant Challenge has been in establishing behaviour change. Focusing on novice cyclists at registration, 70% in the second post Challenge survey have said that they are now cycling more often than they did three months before the Challenge.



**Figure 6. Graph to show novice participants' perceptions of their cycling behaviour 3 months after the Challenge**



#### 4. Evaluation

The majority of novice cyclists at baseline who are now cycling once a week or more have cited the Challenge to be the most significant contributor to their change in behaviour. Although the prize incentives were an important element in order to attract people's attention initially, the Cycle Challenge itself has proved to be an incentive for getting back on to a bike or learning how to ride one properly. One participant had noted *"I felt it gave me the incentive to get back onto a bike and start cycling again"* (Southampton participant); and another stated *"I will continue to cycle until the clocks change and plan to do so again next year. The challenge was an excellent project to kickstart people like myself who just needed a push"* (MK participant). Similar responses have been highlighted by novice participants at baseline who took part in the Edinburgh Cycle Challenge. One participant who is now cycling more often cited that that *"I took part in the challenge and enjoyed it so want to ride my bike more"*.

Some other responses given by novice cyclists who are now cycling more often:

- *More confident on my bike*
- *Cycle challenge definitely played a part and it was easier to keep going once you started*
- *I am cycling to work for at least 3 days each week as well as using it to cycle into town to attend evening classes. Before the challenge I did not cycle to work and I did not own a bike.*
- *More confident using the roads in Edinburgh. Wanting to get fit and use the car less.*
- *I realised after the challenge that I have a very good bike and I should make more use of it*
- *I hadn't cycled for years before the Edinburgh Cycle Challenge*
- *The Challenge made a huge difference! It's such a good motivation and simply reminds me it's very easy to get on a bike every morning.*

The results achieved by Edinburgh Cycle Challenge 2010 are better than the national average, emphasizing the potential in the Cycle Challenge implemented across Scotland. With excellent figures for comparison, as well as strong feedback from participants, it is clear from the results that the Challenge programme has achieved that a behavioural change model is crucial when attempting to change sustainable transport attitudes.

#### **4. Concluding thoughts**

Conclusively, a behaviour change approach has been shown to be effective in concept and in practice. This paper has shown how the Workplace Cycle Challenge has had a positive and long-lasting impact on novice cyclists through its model which integrates specific behaviour change theories coupled with social marketing narratives. With an average of more than one third of participants cycling a few times or less in the last 12 months at the time of registration, the sample size was large enough to then be able to evaluate this group further. This group was central to assessing the potential benefits of a scheme such as a Workplace Cycle Challenge, because we would assume them to be the most resistant group. The behaviour change theories of self-perception, self-efficacy and social cognitive have been integrated together smoothly into the values of the Workplace Cycle Challenge. It reflects the spirit of Azjen's (1991) Theory of Planned Behaviour in the self-perception, self-efficacy and social cognitive theories (for more example, please see Bandura, 1997; Luszczynska and Schwarzer, 2005) that have provided the foundation of the model to be built upon. With over half of all novice cyclists at the time of registration (57%) now cycling as occasional or regular cyclists, and 34% saying that they are cycling more often than they did three months prior to the Challenge, the evidence has shown that taking a multidisciplinary approach the integrates behavior into encouraging the uptake of cycling will achieve results and can be measured in its success.

The Workplace Cycle Challenge is a model that can be replicated both nationally and internationally. It is able to reach out and penetrate segments of the population who have little or no cycling experience at all and who may be resistant to the notion of cycling yet would be responsive with the support and incentives that are provided as part of the Workplace Cycle Challenge. The combination of a socio-psychological approach intertwined with the provision of support on the ground and facilities to make a short cycle ride possible has meant that actual barriers would be minimised and perceived barriers will be put to the test. Therefore, this approach is recommended to not only increase the numbers of novice cyclists, but to maintain their enthusiasm and increase their cycling frequencies.

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