HAS THE INTRODUCTION OF THE CYCLE TO WORK SCHEME INCREASED LEVELS OF CYCLING TO WORK?

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Abstract

In today's society, there is an even more apparent need to find solutions to two real causes for concern, where traffic congestion can bare so many adverse consequences, and where levels of obesity are higher than before, the quest to stem the flow of these plagues of modern day living is undeniable. This research considers whether the use of a financial incentive has been an effective and useful tool in achieving at least one of these goals.

The overarching aim of this study is to establish the value of the Cycle to Work (tax-free) Bike scheme in encouraging people to cycle to work. Using primary data, collected from 248 scheme participants and 101 non-participants, it attempts to identify whether there was a change in travel behaviour among scheme participants and to what extent; and to evaluate if publicity and promotion of the scheme encouraged scheme participation. The study also investigates which socio-economic and other factors influence the propensity to participate in the scheme, and explores the correlation between stages of behaviour change and a person's intention to cycle.

1. Introduction

In recent years there has been a huge rise in the levels of car ownership and use and generally most households in the UK have access to at least one car. This growth has led to rising levels of traffic and congestion, with congestion generally peaking between 8-9am and 5-6pm; times normally associated with the journey to and from work. It is these journeys that account for greatest distance travelled by individuals throughout the year.

Transport is also a significant source of carbon dioxide (CO_2) emissions which account for around 80% of the UK's greenhouse gas emissions (Department for Energy and Climate Change, 2009) which partly causes the global phenomenon known as climate change.

Persuading car drivers, however, to leave their car at home can be extremely challenging. This is mainly because users generally only consider the costs and benefits to them as an individual and do not think of the wider social impact of their choices, therefore the decision to travel by car is generally made by an incomplete appraisal of the full costs and benefits. The full costs and benefits should include all those that affect the individual, and those that the individual creates for others by his or her action.

One approach for persuading a change in behaviour is with financial incentives. Financial incentives and disincentives are increasingly being used to encourage changes in human behaviour. They work on the basic economic premise that people will make choices and take action if it involves economic gain (or at least a perceived gain) and vice versa.

Accordingly, in a bid to reduce congestion, environmental pollution, CO_2, and encourage a more active lifestyle, the government introduced the Cycle to Work scheme as part of the 1999 Finance Act. This scheme effectively reduces the purchase price of a new bike through a tax exemption.

The Cycle to Work scheme (pre August 2010) offers a way to substantially cut the cost of bikes to employees who participate. This scheme enables a firm to operate a 'salary sacrifice' arrangement to provide a bicycle and equipment free of VAT, tax and National Insurance contributions – amounting to savings of up to 40-50%. The way it works is that the company purchases the bike and equipment and then recovers the purchase price by leasing it to the employee, reducing the recipient's gross salary by the necessary amount each month over a period of 12 or 18 months. By the time the scheme has expired, the 'fair

market value' of the bike has generally depreciated to such an extent that it can be offered for sale to the employee at about the cost of one or two months' lease (DfT, 2008). Apart from the obvious financial commitment, participants of the scheme are expected to use the bicycle to commute to work at least some of the time.

The scheme has been effective now for almost ten years, but indications suggest that there has been little or no monitoring carried out, and consequently no real sign of how effective the scheme has been. At this stage it is worth noting the recent changes to the Cycle to Work scheme which were announced in August 2010. The scheme remains broadly similar with one exception. The 'fair market value' payable at the end of the salary sacrifice period has been changed. There is now a table of values which sets in stone what employees must pay for the bike at the end of the hire period, and this is often substantially higher than the amount that was demanded previously. It remains to be seen what the take-up of the scheme is, however first impressions are that it will be a less attractive proposition for many people. This study and any associated data collection were carried out prior to these changes taking place.

This paper explores and examines whether the scheme led to an increase in cycling numbers to and from work, who were the most likely participants of the scheme, whether the scheme acted as trigger for behaviour change and the effectiveness of the publicity and promotion of the scheme.

2. Literature Review

2.1 Car vs. bicycle

In current times, the private motor car, statistically at least, is the most preferred mode of travel, primarily because it meets peoples' perceived need for convenience, freedom, security, privacy, time benefits and status (Bonsall, 2005). A significant contributor to the growth in road journeys is the journey to work or commuter travel. These journeys account for greatest distance travelled by individuals throughout the year, accounting for 1340 miles per year per person. In 2008, 74% of all journeys to work were made by car, compared to 23% for public transport, 1% for walking, 1% for bicycle, and 1% for motorcycle (DfT, 2009).

As far as UK government policy is concerned cycling has a dual role to play, not only is there much potential for it to replace less sustainable modes of transport and aid a reduction in congestion and pollution, it also has significant personal health and fitness benefits too. The British Medical Association (1992) states that journeys of less than 3 miles (5km) are within cycling distance for most people and there is cycling potential where people travel 5 miles or less to work. As well as reducing emissions, cycling can bring additional benefits for health, reduced congestion on our roads and improved local air quality, making our towns and cities more pleasant places to live.

In many ways and as far as the UK government is concerned, the promotion of more sustainable urban transport, such as cycling, is largely dependent on the extent to which people can be persuaded to change transport modes, either through the promotion of sustainable alternatives, or through imposing penalties on transport that isn't environmentally sustainable, or indeed both.

2.2 Main principles of the Cycle to Work scheme

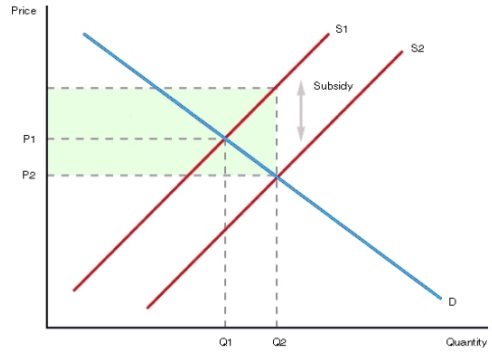
Most decisions in life are carefully considered with people constantly choosing how to spend their limited time and money. Their decisions tend to reflect their knowledge, preferences and values. When it comes to transport and travel, both time and money are generally considered carefully before deciding which mode of transport to use and which route to take. To an individual the price of transport and travel is the direct perceived costs incurred for using it. Consequently, price changes are known to affect consumer opinions, attitudes, therefore consumer decisions, and behaviour. In this sense transportation as a good is no different to any other consumable good, with price changes known to affect changes in travel behaviour. Even small price changes are known to have a large effect in travel decisions (Litman, 2009).

The use of financial incentives and disincentives is not a new concept and certainly, the use of cigarette and alcohol taxes has proved successful when affecting human behaviour. See

for example Avineri and Goodwin (2010) for a review on the evidence on the effect of economic interventions, price effects and financial incentives on behaviour change in a range of transport and public health behaviours.

Economic theory can justify the use of financial incentives, taxation and subsidisation where market fails to converge into the optimal equilibrium; the desired change in the equilibrium in the presence of positive externalities of cycling (where S_1, the social benefits, are larger than S_2, the private benefits to the 'consumer'), and the case of subsidy, are illustrated in figure 1. At an initial price of P_1, consumers in the market demand a total quantity of the products of Q_1 units, but as figure 1 demonstrates, as employees receive their subsidies towards the cost of a new bike, P_2, so the quantity of bikes demanded increase as indicated by Q_2. The direct effects of introducing a subsidy would be a reduction in the cost of cycling (in P_1-P_2), increase its use levels (in Q_2-Q1) and an increase in revenue from customers as more people would purchase bikes. As cycling might be seen, in many situations, as a substitute product to car use, a subsidisation of cycling is also expected to lead to a decrease in car use and to a decrease in the external costs associated with car use.

Figure 1: The effects of introducing a transport subsidy



However, Kohn (1993) has expressed some scepticism regarding the use of financial incentives, suggesting changes to behaviour are unlikely to be permanent. Incentives, or extrinsic motivators as psychologists call them, do not necessarily alter the attitudes that underlie human behaviour; and that they do not create an enduring commitment to any value or action. Studies show that offering incentives for losing weight and quitting smoking are not only less effective than other strategies but often prove worse than doing nothing at all. This maybe partly because extrinsic motivators are generally a poor substitute for a genuine interest, or belief in something.

There is also the argument that receiving a reward for a particular behaviour sends a certain message about what someone has done and can be viewed as an attempt to control behaviour both now and in the future. Generally, the more people are controlled the more tendency there is to lose interest. For example, if someone goes to work thinking about the possibility of getting a bonus, he or she may come to feel that his or her work is not self-directed, and rather that it is the reward that drives the behaviour.

There is another theory that suggests the reason why rewards or financial incentives can have a negative effect on intrinsic motivators. Anything presented as a prerequisite for something else that is, as a means towards another end – comes to be seen as less desirable; or to put it another way, the recipient of the reward assumes "if they have to bribe me to do something, I wouldn't want to do it anyway!" However, Marteau *et al* (2009) propose that offering a reward can help people align their actions more closely with their beliefs and perceptions, suggesting that participation in the Cycle to Work scheme could be the first step in an individual's change of belief and action towards cycling to work.

2.3 Marketing, publicity and promotion

So far, this review has primarily considered the use of financial incentives to encourage behaviour change; however, there are a number of other factors, which can also influence an individual's choice of behaviour. In recent years, transport planners have started paying serious attention to employing soft measures to help meet sustainable transport policy objectives. Generally soft measures seek to influence travel behaviour and so encourage a voluntary switch from car travel to more sustainable modes. The intention is to provide better

information and opportunities, aimed at helping people to choose to reduce their car use while enhancing the attractiveness of alternatives (DfT, 2004). In a policy context in which there is pressure to contain traffic growth, yet a political nervousness about applying strong restraint measures, soft measures potentially offer an attractive means of addressing this problem.

As Jones and Sloman (2007) point out one reason for the slow take up of soft policy measures is a general lack of understanding of the ways in which marketing and management initiatives influence travel attitudes and behaviour. Most travel behaviour and modelling research is predicted on the economic theory in which travellers are generally assumed to be rational decision makers who like to maximise their utility.

2.4 The study of attitudes

The Theory of Planned Behaviour (Ajzen, 1991) suggests that "as a general rule the more favourable the attitude towards the behaviour the stronger the individuals intention to perform the behaviour under consideration". In order to explain and predict human behaviour, an individual's attitude towards and their intention to perform that behaviour needs to be clearly understood. Attitudes can be useful prediction tools when it comes to predicting behaviour; however, they are no guarantee. Attitudes can be quite general whereas behaviour tends to be more specific. Situational factors can also contribute to choice of behaviour. For example whilst a person may have a very strong and positive attitude towards cycling, other factors may prevent them from cycling, such as distance, weather, and time. To identify the factors which may influence a person's decision to participate in the Cycle to Work scheme there is a need to examine an individual's perception and attitude towards not only cycling but also the Cycle to Work scheme itself. It is possible that a participant or potential participant could have a less than favourable attitude towards cycling but has a favourable attitude towards the financial incentive on offer. In other words does an individual participate in the scheme because they are sensitive to a reduction in the cost of a new bike or because they recognise the many benefits cycling has to offer them?

There have been many previous studies of attitudes of both cyclists and non-cyclists, all identifying a broad range of cycling issues. Research carried out by Gatersleben & Appleton (2007) cited Prochaska and Diclemente's (1984) model of behavioural change. This model views behaviour change as a process rather than an event, see figure 2. They examined the individual views of commuters in these different stages of change. Two studies were conducted amongst university staff and students. The studies showed that as people progress from pre-contemplation to action their attitudes towards cycling became more positive and their perceptions of various personal and external barriers change. This suggests that different strategies are necessary to move people in different stages of change

Figure 2: Stages of change in Prochaska and Diclemente's (1984) model of behavioural change

Stage	Characteristics	Change strategy
Precontemplation	Unaware of problems, no intention of change	Increase general problem awareness
Contemplation	Aware of problems, thinking about change	Motivate, encourage specific action
Prepared for action	Intention to change in next 6 months	Assist in developing specific plans
Action	Action being taken	Feedback, social support, reinforcement
Maintenance	Has maintained action for 6 months or more	Reminders, feedback, social support

According to the model in figure 2, behaviour change is a slow process, which requires constant attention. The research showed that whilst it is important to address physical barriers such as distance and lack of safe cycle lanes, this alone would not lead to more

cycling. Even those motivated to cycle might need help to get started and especially to continue to cycle.

This study presents the following research questions:

- Which factors influence the propensity to participate in the Cycle to Work scheme?
- Does membership of the Cycle to Work scheme activate travel behaviour change?
- Has the Cycle to Work scheme increased levels of cycling to work?

3. Research methodology

The primary research method used in this study was a web-based questionnaire survey. In order to provide a holistic survey respondents consisted of 248 scheme participants and 101 non-participants equalling a total sample size of 349. Table 1 shows the distribution of respondents and response rates.

Table 1: Questionnaire distribution and response rates

Employer	Employees	Scheme participants	Scheme response rate	Scheme participants respondents to survey	Survey response rate
Bournemouth Council	6516	148	2.27%	33	22%
Dorset County Council	14,000 approx	124	0.88%	11	9%
Dstl (MOD)	3750	156	4%	61	39%
North Somerset Council	6500	170	2.61%	40	23%
South Gloucestershire Council	9300	310	3.33%	10	3%
Wiltshire Council	15,000 approx	267	1.78%	82	30%
Other				11	
Sub-total	**55,066**	**1175**	**Mean - 2.13%**	**248**	**Mean - 20%**
Wiltshire Council scheme non-participants respondents				**101**	
Total sample size				**349**	

It would have been preferable to survey non-participants from each of the employers where the scheme participant's samples were drawn; however, access to staff at these establishments was not readily achievable with the exception of Wiltshire Council. To compensate for this there is little direct comparison between the two groups, with each group generally being analysed separately.

4. Results

4.1 Socio-economic variables and the propensity to cycle

Socio-economic variables are often useful when trying to identify patterns of human behaviour. They may be used to examine travel choices and can link behaviour to a wide range of causal factors and therefore can be used to develop strategies which seek to change behaviour.

Gender representation was broadly similar between scheme participants (male: 61% and female: 39%) and non-participants (male: 65% and female: 35%), with males having the larger overall representation.

The age profiles for both groups are similar, with the majority of respondents falling in the higher three age groups of 26-35, 36-45 and 46-60 years. With the exception of the lower age category (16-25), the distribution of ages reflects those reported by DfT (2007), where there is a fairly even spread of ages across the middle category ages groups before it dips at the 60+ category, which indicates that older individuals are less likely to participate in the scheme.

The family structure profiles have definite similarities between participants and non-participants; with the "partner with children" category having the largest number of respondents for both groups (participants 51% and non-participants 41%) and the category "single with children" had the lowest number of respondents for both groups (participants 4% and non-participants 9%).

The incomes for both groups are again not dissimilar with 50% of participants falling within the £25,000-40,000 income bracket which can be compared with the median weekly wage of full-time employees which in April 2009 was £489 (ONS), this equates to an annual salary of £25,000 approximately per year. This indicates that at least 50% of participants responding have at least an individual salary the same or similar to the national average.

Respondents stated the distance they live from their normal workplace. This profile shows some differences between the groups, with more non-participants in the 10+ miles category. DfT (2007) reports that the average commuter trip in 2005 was 8.7 miles which for the purpose of this study, means that at least 23% of scheme participants and 38% of scheme non-participants live further away than the average commute distance.

Table 2: Logistic regression analysis: participation in the Cycle to Work Scheme

Explanatory variables	B	Sig
Gender(1) - male	-1.09	0.00
Age – 16-25		
Age(1) - 26-35	0.78	0.19
Age(2) – 36-45	0.16	0.81
Age(3) – 46-65	-0.09	0.89
Family – single without children		
Family(1) - single with children	-0.19	0.77
Family(2) - partner without children	-0.17	0.67
Family (3) - partner with children	0.14	0.75
Income - £0-15,000		
Income(1) -£15,000-25,000	-0.67	0.24
Income(2) - £25,000-40,000	-0.28	0.63
Income(3)- £40,000 +	1.18	0.12
Distance - less than 1 mile		
Distance(1) – 1-2miles	0.51	0.35
Distance(2) – 2-3 miles	1.73	0.01
Distance(3) – 3-5 miles	1.70	0.00
Distance (4) – 5-10 miles	1.17	0.03
Distance (5) – 10 miles plus	-0.06	0.91
Constant	0.79	0.37

In order to identify if the independent variables have any statistical relevance in explaining the propensity to participate in the Cycle to Work scheme, direct logistic regression was carried out to assess the impact of a number of factors on the likelihood that respondents would participate in the Cycle to Work scheme. The model, see table 2 contained the five independent variables (gender, age, family structure, income and distance from work).

The full model containing all five predictors was statistically significant, χ^2 (5, N = 349) = 62.195, $p < .001$, indicating that the model was able to distinguish between respondents who have participated in the scheme and those that have not. The model as a whole explained between 16.7% (Cox and Snell R squared) and 23.9% (Nagelkerke R squared) of variance in participation status, and correctly classified 73% of cases. Only two of the independent variables made a unique statistically significant contribution to the model, namely gender and distance.

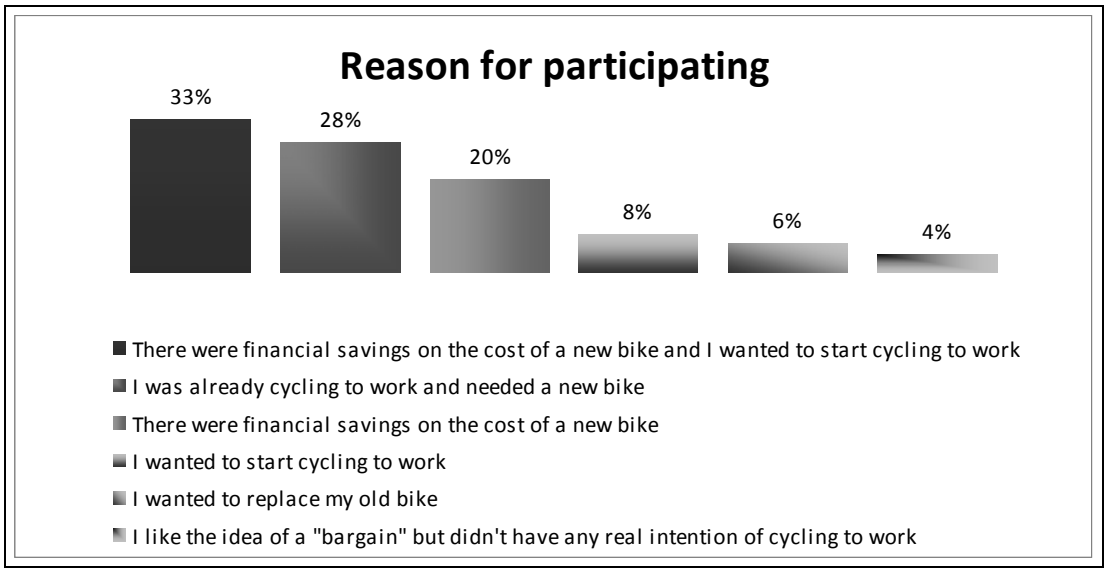
These results indicate that females have an odds ratio of .34 which means that males are 2.94 times more likely than females to participate in the Cycle to Work scheme.

The results also indicate that participants living 2-3 miles or 3-5 miles away from work are over 5 times more likely to participate in the Cycle to Work scheme than someone living less than a mile away. Similarly, participants living 5-10 miles away from work are over 3 times more likely to participate in the scheme than someone living less than a mile away.

4.2 Scheme participation and behaviour change

In order to initially establish how significant the financial incentive element of the Cycle to Work scheme was, respondents were asked to identify their primary cause for joining or not joining the scheme. The findings, see figure 3, indicate that the financial incentive was one of the triggers for scheme participation with 57% of scheme participants citing the financial savings as primary reason for joining, although 4% of these admitted they had no real intention of cycling to work.

Figure 3: Reason for participating



The primary reason cited for not participating in the scheme was that respondents felt it was too far to cycle to work (28%), see figure 4. 18% of non-participants did not join the scheme because they already owned a bicycle. Interestingly, only 3% felt that the financial benefits were not sufficient enough to warrant joining the scheme.

The primary driver of this study was to establish if the Cycle to Work scheme has achieved what it set out to do, which is to change travel behaviour and increase levels of cycling to work. In order to provide some kind of measure of cycling levels, scheme participants were asked to state their before and after scheme participation cycling levels. On face value figure 5 indicates that cycling levels have increased as a result of the scheme. Perphaps the most telling indicator is the strength of the “before participation never” column which shows a significant reduction from the “after scheme participation” column.

Whilst the preliminary results do indicate that cycling levels have increased, there is a requirement to establish whether these results have occurred by chance or are statistically significant, a Wilcoxon Signed Rank Test was carried out. Scheme participants were asked to provide their pre and post scheme participation cycling levels to work based on a seven point scale ranging from never to daily as shown in figure 5.

The following hypothesis was tested:

H_O = since the introduction of the Cycle to Work scheme cycling levels to work have not increased.

H_1 = since the introduction of the Cycle to Work scheme cycling levels to work have increased.

Figure 4: Reasons for not participating

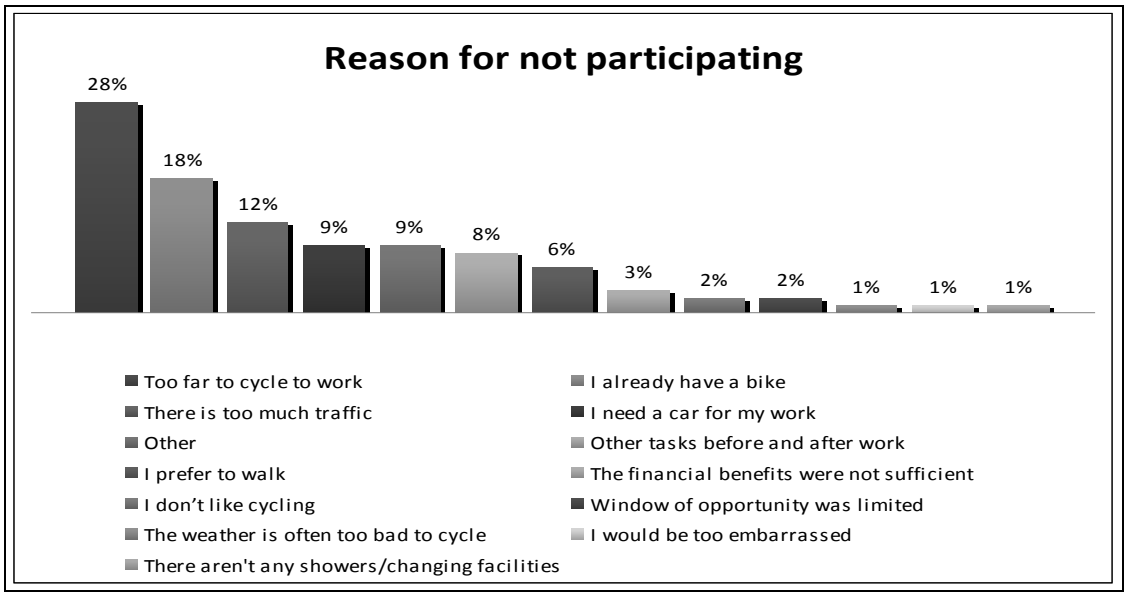
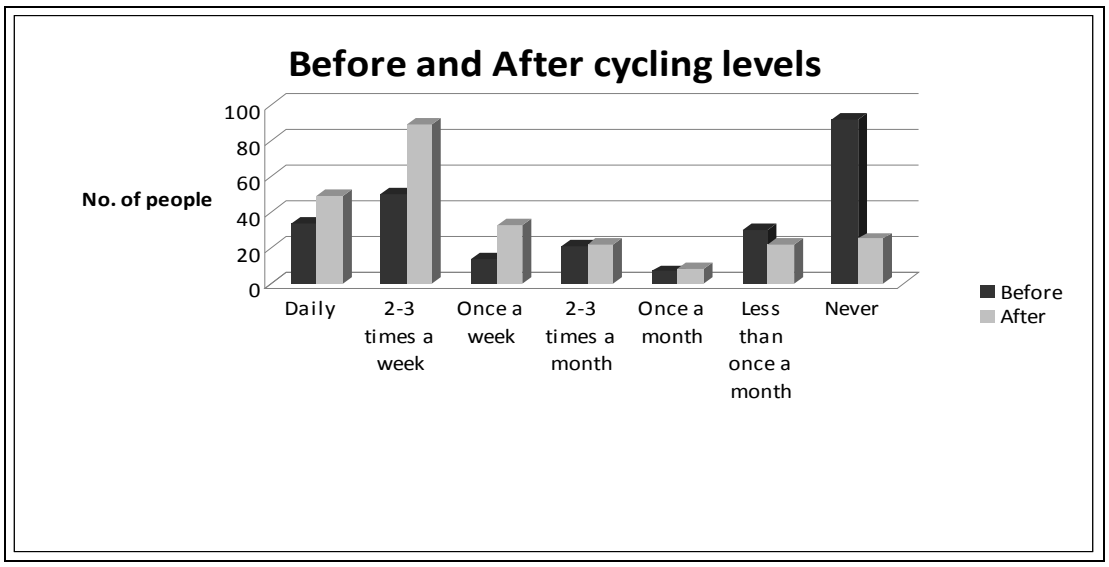


Figure 5: Cycle levels



The test revealed a statistically significant increase in the levels of cycling to work following participation in the Cycle to Work scheme, z = -9.194, p = < .001, with a medium/large effect size (r = .40). The median score on the Cycling Levels Scale increased from pre-scheme (*Md* = 2) to post-scheme (*Md* = 5).

In their broadest sense, the results suggest that the Cycle to Work scheme has increased cycling to work, or to put it another way, since the introduction of the Cycle to Work scheme cycling to work has increased.

However, this test does not provide for all the other possible factors that may account for the sample population increasing their levels of cycling. For example, there may have also been substantial improvements to the cycling network, or new traffic demand management initiatives which have made cycling much safer, faster and flexible.

A somewhat cautionary note is required here mainly because it would be very difficult for certain "groups" of cyclists to be sure about the level of cycling they undertake. For example, there may be cyclists that cycle only during the summer months on fair weather days, or those that only cycle when a car isn't available. It therefore must be assumed that these results reflect average cycling levels of respondents and not necessarily exact cycling levels. To be able to provide exact cycling levels requires the use of travel dairies, which due to lack of time and resources could not be utilised here.

4.3 Publicity and Promotion

All respondents were asked to recall the cycling campaign/advert they were exposed to. No distinct pattern emerged from the results; perhaps the most interesting aspect was that 38% of scheme participants could not recall the most recent cycling campaign. Conversely 36% of scheme non-participants could recall an advert about the Cycle to Work scheme.

4.4 Stages of behaviour stage

For the purpose of this study behaviour change is recognised as two primary interactions, the act of scheme participation and the act of cycling to work. In a bid to try to demonstrate the stages of behaviour change amongst those responding to the survey all respondents were asked how they felt about cycling to work prior to joining the scheme.

The options offered were as closely aligned as possible with the stages of behaviour change as suggested by Prochaska and Diclemente (1984). Table 3 provides an indication of how each question was posed and how it relates to each stage of behaviour change.

Table 3: Stages of behaviour change questions and proportion of respondents

PARTICIPANTS				
Stage of behaviour change	**Question** (pre scheme intention of participants)	**No of respond'ts**	**% of respond'ts**	
Pre-contemplation	I had no intention of cycling to work	32	13	
Contemplation	I was considering cycling to work	49	19	
Prepared for action	I was intending to start cycling to work	40	16	
Action	I was already cycling	84	34	51
Maintenance	I was cycling prior to the scheme and have continued to do so	43	17	
	Total	**248**	**100**	
NON-PARTICIPANTS				
Pre-contemplation	I have no intention of cycling to work	36	36	
Contemplation	I am considering cycling to work	26	26	35
Prepared for action	I would like to start cycling to work	9	9	
Action	I already cycle to work	30	29	
Maintenance				
	Total	**101**	100	

Table 3 also shows that the majority of scheme participants, 51%, were already cycling to work and have continued to do so since (action and maintenance) thus suggesting that whilst their travel behaviour has not altered, there is possibility that without the Cycle to Work scheme they would not continue to cycle to work. Of the scheme participants, 19% were contemplating cycling to work and 16% were intending to start cycling, with 13% having no intention of cycling to work. As expected a large proportion, 36% of scheme non-participants have no intention of cycling to work, however 35% would consider or would like to start cycling given the right circumstances.

So far this study has established that participation in the Cycle to Work scheme is just one stage of the travel behaviour change process. There is no real evidence to indicate that scheme participation is enough to fully enact behaviour change.

To further establish whether scheme participation is the primary reason for a person cycling to work, scheme participants were asked to reveal whether they would have cycled to work without membership of the Cycle to Work scheme. The results show 50% of respondents would still cycle and therefore there is no change to their intention, 13% are undecided whether they would cycle which leaves 37% of the sample population who could possibly attribute the scheme with their change in travel behaviour.

However, interpretation of these results may not be quite as simple as first thought. Unfortunately, establishing reasons for behaviour change is not generally that straightforward. It is possible that many other factors could initiate a change in behaviour; this may include personal influences such as changes to income, distance and location of work, car ownership, injuries and illness and commitments outside of work. Other influences could be external and may include improvements to the local cycle network, changes in traffic management which has made cycling much easier and safer, and the introduction of policies which encourage cycling generally. There is also the challenging task of getting respondents to reveal their true behaviour, thoughts and action.

Therefore, to be able to say with confidence that the Cycle to Work scheme has initiated behaviour change is very difficult with the limited data available. This area of study requires much further investigation.

5. Discussion

The findings from the analysis of the propensity to participate in the Cycle to Work scheme indicate that males, as well as participants living between 2 and 10 miles away from work are more likely to participate in the scheme. These findings appear to reflect those reported by DfT (2007) where on average, males make more cycle trips than females. They also accord with research by Dickinson e*t al* (2003) who suggest that financial incentives are more appealing to men than women with both of these indicating that more men are likely to participate in the Cycle to Work scheme.

As far as distance to work is concerned it is necessary to consider some of the reasons for not participating in the scheme (see figure 4). 6% of the scheme non-participants prefer to walk to work, suggesting that they live within walking distance of their normal workplace. DfT (2007) reports that on average females make 15% more walking trips than males, with 11% of all commuting trips being made on foot. This may therefore explain why those living within 2 miles of the workplace, particularly females, do not cycle to work but instead choose to walk. It is also somewhat expected that the 10 miles plus category does not show any statistical significance in influencing behaviour, whilst there are some respondents who do cycle to work that live this distance from work, it would not be expected to be the norm with Kingham *et al* (2001) citing distance as a barrier to cycling. However, achievable cycling distance is subjective and hard to quantify, and what is within cycling distance for many may not be achievable by others. Topography can also play a significant role, and whilst the collection of this type of data was omitted from the survey it must be acknowledged as being a significant factor for many when choosing whether to cycle or not.

It is also worth considering those variables that were not significant in influencing participation of the scheme. The age structures of both groups were quite similar, with the majority of respondents falling in the middle three age categories. These findings link well with those reported by DfT (2007) which shows an even age split from age 17 through to age 59, with just a slight dip between ages 50 and 59. These results therefore suggest that age is not generally a barrier to cycling.

In contrast quite often household responsibilities, including children, are cited as reasons for not being able to cycle to work. It is therefore not surprising that of the total scheme participants only 4% were single and had children. On the other hand, what is perhaps more interesting is that 51% of scheme participants had children, which indicates that children are not necessarily a barrier to cycling where there is a partner to share household duties with.

Following on from this, it has already been noted from the data that males are more likely to cycle than females, and indeed there are more males in the “partner with children” category, suggesting that household duties are likely to be more of a barrier to women than men,

which probably also helps to explain why more men than women have participated in the Cycle to Work scheme.

Overall the results and further analysis has provided some insight into the type of persons that are most likely to participate in the scheme and some possible reasons for this. The list of socio-economic variables used is by no means exhaustible, ideally given the resources it would be preferable to use a wider list of variables, to enable more explicit profiles to be developed.

The findings also show that a person's intention to act and/or their current action can be a good indicator of the likelihood of behaviour change; and it is seemingly at this stage of the behaviour change process that a person is more susceptible to the financial lure of the Cycle to Work scheme. However, perhaps the real challenge is not only to encourage scheme participation but to ensure that those participants of the scheme which have not previously cycled to work also enter the next stage of behaviour change and indeed start cycling to work.

Approximately half (49%) of scheme participants did not previously cycle to work, and for sure some would have contemplated the idea and notion and it is those that are probably the most likely to turn their thoughts into action. However, there are some that had no intention of cycling to work and it those that will need more than just a cheap bike to encourage them do so. As discussed in the literature review, it is perhaps these scheme participants which have a favourable attitude towards the financial incentive on offer, however, they have a less than favourable attitude towards cycling. This is perhaps where the innovative use of cycling publicity should be aimed to try alter the attitudes and perceptions of these potential cycle commuters to work.

6. Conclusion

The financial savings on the cost of new bike have seemingly stimulated some scheme participation. However, overall the relative low numbers of participation question whether these financial gains are enough to really make a difference when trying to correct the negative externalities caused by driving a car.

When considering the factors which increase propensity for scheme participation, there is a need to take into account a person's intention to act. On the face of it there is a correlation between the financial incentives and a person's intention to cycle, and it is a combination of the two that ultimately activates scheme participation.

Ostensibly scheme participation does have a role to play when it comes to cycling to work, but whether it is the sole motivator is doubtful. Clearly to cycle you have to have a bicycle, but to actually cycle require lots of other motivations, perceptions and often other intervention. So broadly speaking, scheme participation largely contributes to a change in behaviour, however, to be able to state with confidence that the scheme instigates behaviour change requires further examination.

This study also revealed that cycling to work has increased since the introduction of the Cycle to Work scheme, although it is questionable whether the scheme is the sole reason for this. Many other factors or a combination of factors could be responsible for the increase. In the absence of specific cycle monitoring and with the type of quantitative survey used during this study it is very hard to pin-point the exact reason or reasons for change in cycling behaviour. Nevertheless in its rawest sense the Cycle to Work could be attributed for the increase in levels of cycling to the work place.

The findings from this study indicate who is most likely to participate and who is not. This information could be useful when considering relevant marketing campaigns and target audiences. Whilst this study has not delved that deeply into the type of publicity and promotion used, the findings indicate that there was a general lack of innovative marketing. Promotion of the scheme has seemingly relied mostly on the financial attraction of the scheme without much regard to the wider benefits of cycle ownership and cycling.
Finally, given the recent changes to the Cycle to Work scheme it will be interesting to see what the take up of the new scheme is. With the financial benefits which it previously relied upon to entice new members now reduced there is a definite need to use more innovative and adventurous publicity and promotion

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