



Cycling promotion schemes and long-term behavioural change: A case study from the University of Sheffield



J. Uttley^{a,*}, R. Lovelace^b

^a School of Architecture, University of Sheffield, UK

^b School of Geography, University of Leeds, UK

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ABSTRACT

Cycling has a range of health, environmental and economic benefits compared with motorised forms of transport. There is a need to encourage more cycling, yet previous evaluations of cycling promotion schemes have been inconclusive about what works. A case study of a cycling promotion scheme at the University of Sheffield – the Cycle Challenge – is used in this paper to examine commuting behaviour and long-term behavioural shifts towards cycling in response to outside intervention at the organisational level. The Cycle Challenge was designed to encourage more people at the University to cycle through inter-departmental competition. Cycling behaviour was recorded before the Cycle Challenge and two years after the scheme's completion. It was found that seventy five percent of participants who were not already regular cyclists reported increased cycling, yet the overall impact of this shift was limited because the majority of participants already cycled regularly. This failure to attract new cyclists suggests recruiting non-cyclists should be a priority in future schemes. Moreover, our study has methodological implications. Current strategies for evaluating the positive impact of cycle initiatives may overestimate the savings by neglecting the tendency of people to resume routine behaviour in the long run. Studies evaluating modal shift should therefore include provision for monitoring long-term behavioural change to provide input into estimated economic, environmental or health metrics of success.

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1. Introduction

Cycling has a range of benefits to both individuals and wider society. It offers an accessible form of physical activity for many people, and regular physical activity has a number of health benefits, including reduced risk from cardiovascular disease, cancers and diabetes (Department of Health, 2004; Manley, 1997; Saunders et al., 2013), improvements in cardiovascular fitness and risk factors (Oja et al., 2011), and overall mortality rates (Kelly et al., 2014). Motorised transport has been identified as a causal factor behind the 'obesity epidemic' (Caballero, 2007), suggesting a return to active transport for everyday journeys would have large health benefits. Physical activity has also been shown to support mental well-being and reduce mental health problems such as depression and anxiety (Department of Health, 2004; Manley, 1997). Given that 61% of men and 71% of women

in England do not meet recommended levels of physical activity¹ (Craig et al., 2009), regular cycling offers an opportunity to improve public health and reduce the burden on health services.

Environmental benefits of cycling are also frequently cited as a reason for uptake on the individual level (Gatersleben and Haddad, 2010) and as a motivation behind pro-cycling interventions by local, regional and national authorities (Blank et al., 2012; Pucher and Buehler, 2008). The economic benefits of cycling have been identified as reduced congestion (and faster journey time), increased worker productivity and reduced travel costs for individuals (Saelensminde, 2004; Tilahun et al., 2007). However, most comprehensive economic analyses identify reduced expenditure on health as the most important saving (Jarrett et al., 2012; Rutter et al., 2013). There is now strong evidence to suggest that the health benefits of increased life expectancy vastly outweigh the

* Corresponding author.

E-mail addresses: j.uttley@sheffield.ac.uk (J. Uttley), r.lovelace@leeds.ac.uk (R. Lovelace).

¹ Based on previous definition of at least five occasions of moderate or vigorous activity of at least 30 min duration per week. Guidelines have now changed to be at least 150 min over a week of moderate activity in bouts of 10 or more minutes. See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213740/dh_128145.pdf.

health costs of accident risk and exposure to air pollution (Hillman, 1993; Rojas-Rueda and Nazelle, 2011). Health benefit:cost ratios of cycling have been identified as 20:1 in the UK (Hillman, 1993) and more than 70:1 in Barcelona (Rojas-Rueda and Nazelle, 2011). A recent meta analysis about the health impacts of active travel overall (walking and cycling) concluded that the evidence to date provides “consistent support for the positive effects on health of active travel” (Saunders et al., 2013; p. 12). There is also evidence to support the ‘strength in numbers’ hypothesis that cycling becomes safer per kilometre as the number of cyclists increases (Pucher and Buehler, 2008). Guidance has recently been published (Kahlmeier et al., 2014) that provides methods for assessing the health and economic impacts of cycling which should allow such impacts to be ascertained more accurately from future intervention studies.

Despite the multi-faceted benefits of cycling and the fact that riding a bicycle is something most adults in Britain can do. Eighty five percent of adults in the UK can cycle (Department for Culture, Media and Sport, 2011a), and cycling is the third most common recreational or sporting activity carried out by adults in Britain (Department for Culture, Media and Sport, 2011b). However, only 2% of all trips made in Britain are completed using a bicycle (DfT, 2013). There is much potential for increasing the number of journeys that are taken using a bicycle; for example, 38% of all trips in Britain are less than two miles, and 66% are less than five miles (DfT, 2013). Research in London suggests there are potentially 4.3 million trips per day that could be made by bicycle, yet nearly two thirds of these trips are made by car (Transport for London, 2010). In the UK there have been a number of national policies and local interventions to promote cycling (e.g. DoT, 1996; DfT, 2004; Gaffron, 2003; see Golbuff and Aldred, 2011, for a review of UK cycling policy over the last four decades), but the lack of increase in cycling rates over the last three decades suggests these have had limited success (Parkin, 2003; Cabinet Office, 2009). Aldred (2013a) suggests that cycling in the UK has been marginalised with the car dominating infrastructure, for example car parking often taking precedence over cycling infrastructure for example. The low uptake of cycling can therefore be seen as a result of cultural and societal factors, and there is a need to enhance the position of cycling within local as well as national cultures if cycling activity is to increase (Aldred and Jungnickel, 2014). This may be starting to happen in the UK, evidenced for example by the increase in cycling advocacy groups (Aldred, 2013b). One approach to developing the cycling culture and increase cycling activity is to implement interventions designed to encourage and support cycling behaviour.

A range of research has examined the effectiveness of different activities designed to encourage cycling behaviour (e.g. Davis, 2010; Brockman and Fox, 2011; Bowles et al., 2006; Bauman et al., 2008; Ogilvie et al., 2004; Yang et al., 2010). Recent work at the University of Sheffield (Blank et al., 2012; Johnson et al., 2012) has systematically examined a range of evidence relating to the effects of interventions to promote cycling and walking. As with other reviews (Ogilvie et al., 2004; Yang et al., 2010), the evidence was largely inconclusive. Cyclist-friendly facilities, such as secure storage, showers, and changing facilities at schools and workplaces, were found to be important, especially for promoting long-distance cycle commutes (Johnson et al., 2012; p. 9) However, long-term effects are rarely examined in follow-up work and when they are, ambiguity remained about which aspects of the interventions had the most positive outcomes (Blank et al., 2012), or behavioural change appeared to be limited and difficult to attribute directly to the intervention (Transport Scotland, 2013).

Universities can provide useful case studies of travel behaviour and travel intervention schemes. They are generally large employers thus providing a potentially large sample of commuters, and because University buildings are generally close to each other,

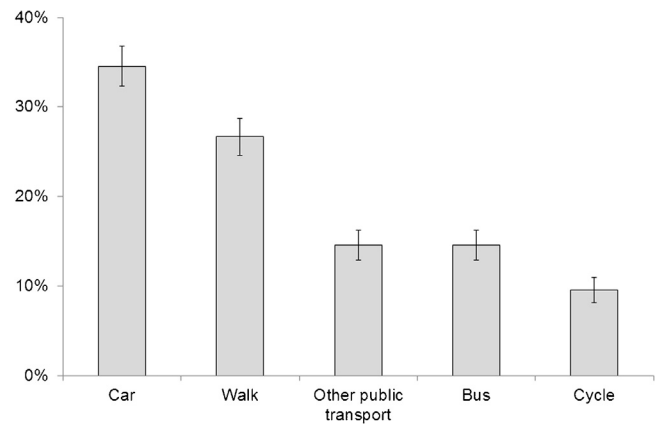


Fig. 1. Proportion of staff respondents travelling to work by mode. Error bars show 95% confidence intervals.

being on campus, they effectively provide a single workplace destination, meaning a focus can be applied to where commuters have travelled from (Lavery et al., 2013). Universities can also provide insights into two distinct populations—students and staff. Indeed, it has been suggested that students are an important segment of the travelling population but their travel behaviour is not well understood (Khattak et al., 2011). A number of previous studies have examined travel behaviour at Universities (e.g. Cole et al., 2008; Delmelle and Delmelle, 2012; Eom et al., 2009; Miralles-Guasch and Domene, 2010; Shannon et al., 2006; Whalen et al., 2013). These have shown that cycling as a mode of transport at Universities is low, often accounting for less than 10% of trips. These low proportions suggest there is scope for increasing the levels of cycle commuting amongst University communities, making them good candidates for cycling promotion schemes. For example, Miralles-Guasch and Domene (2010) found that there was “significant potential for increasing the modal share of walking and cycling trips to the campus” (p. 461) given the proportion of the university community who lived within a walkable or cyclable distance. Shannon et al. (2006) also found that 37% of students and 39% of staff living within 8 km of University were confident they could cycle to University even though only 10% and 14% of these populations currently cycled. It is therefore informative to examine what effect cycling promotion can have within a University context.

In this article we provide a case study of travel behaviour at the University of Sheffield, with a particular emphasis on cycling as a means of commuting. As part of this case study we examine the long-term behavioural effects of a cycling promotion scheme at the University. We focus in particular on staff at the University, as previous studies examining transport at Universities have often focused on the student population but this group tends to have different sociodemographics and travel behaviour to the wider general population (Khattak et al., 2011).

2. Commuting behaviour at the University of Sheffield

Data from the University of Sheffield’s 2011 Travel Survey were analysed to provide information about the dimensions of commuting behaviour. The survey received responses from 1,743 members of staff (31% of all staff at the University in 2010/11) and 1448 students at the University (6% of all students at the University in 2010/11). Only data relating to staff are reported in this paper as this information is thought to be most informative regarding commuting: the student population are unrepresentative of a typical group of commuters as they have atypical

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