The University of Sheffield
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# Synthesis of evidence relating to barriers and facilitators to implementing interventions that promote cycling and walking, and to carrying out cycling and walking for recreational and travel purposes.

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## 1. List of ABBREVIATIONS

| | |
|---|---|
| BMI | Body Mass Index |
| CVD | Cardiovascular Disease |
| DH | Department of Health |
| EU | European Union |
| GP | General Practitioner |
| Hr | Hour |
| NA | Not Applicable |
| NHS | National Health Service |
| NICE | National Institute for Health and Clinical Excellence |
| NR | Not Reported |
| PA | Physical activity |
| RCT | Randomised Controlled Trial |
| SES | Socio-economic status |
| WSB | Walking school Bus |
| WWW | Walking for Wellbeing |

## 2. EXECUTIVE SUMMARY

### Introduction

Physical activity can help reduce the risk of coronary heart disease, stroke and type 2 diabetes by up to 50% (DH 2004) and promote mental wellbeing. However, based on self-reporting, 61% of men (71% of women) in England aged 16 and over did not meet national recommended levels (Craig *et al*. 2009). Guidance for adults has recently been revised to recommend 150mins (two and half hours) each week of moderate to vigorous intensity physical activity (and adults should aim to do some physical activity every day). The proportion of men who are physically active enough to meet national recommended levels decreases markedly as they get older, from 53% at age 16–24 to 16% at 65 plus. The level of activity among women is considerably lower once they reach age 65, with around 12% of women over 65 meeting the recommended levels compared to 28–36% of younger women. In children, sixty three per cent of girls (72% of boys) aged between 2–15 report being physically active for 60 minutes or more on 7 days a week. Girls' activity declines after the age of 10 (The Information Centre 2007). However, objective data suggest this is an overestimate. Black African and Asian adults and black Caribbean women are less likely to meet the recommended activity levels of physical activity than the general population (The Information Centre 2006).

Walking is reported to be the most common, and cycling the fourth most common recreational and sporting activity undertaken by adults in Britain (Fox & Rickards 2004). Among women of all ages, walking (for any purpose) is the most important way of achieving the recommended physical activity levels. It is also one of the most important physical activities for men of all ages –accounting for between 26% and 42% of total MVPA (Belanger *et al*. 2011).

Of all trips made in Great Britain in 2009, 20% covered less than 1 mile. More than half (56%) of car journeys were less than 5 miles (Department for Transport 2010b). It is estimated that, on an average day in London, around 4.3 million trips are 'potentially cyclable' (Transport for London 2010). However, in Britain, the average time spent travelling on foot or by bicycle has decreased, from 12.9

minutes per day in 1995/97 to 11 minutes per day in 2007 (Department for Transport 2010c). Cycle use in Britain is lower than in other European Union (EU) countries. It is estimated that bicycles are used for 2% of journeys in Britain compared to about 26% of journeys in the Netherlands, 10% in Denmark and 5% in France (Ministry of Transport, Public Works and Water Management 2009).

Changes in the number of people walking and cycling could have an impact on health, the environment and the economy. These may be positive or negative, and can be experienced by individuals or populations. Health outcomes include increased physical activity and changes to conditions such as obesity, cardiovascular disease (CVD), type 2 diabetes, some cancers, and mental wellbeing. Cycling and walking are also important ways for people to get to local places and services (such as education, employment, shops, healthcare and recreation). This, in turn, could boost the local economy while having a positive impact on the environment. For example, a decision to cycle or walk rather than drive reduces the emission of air pollutants and carbon dioxide.

Walking and cycling may have unintended consequences, some of which may be counter-intuitive. For example, deciding to cycle might replace another more intense activity (such as going to the gym) which may result in an overall reduction in physical activity. In addition, walking or cycling, rather than driving, may result in a different level of exposure to air pollution. Generally, cyclists and pedestrians experience higher rates of injuries than motorists (Department for Transport 2010b). However, there is also some evidence to support the hypothesis that increasing the number of cyclists reduces the risk of injury, possibly by making drivers and cyclists more familiar with each other (Jacobsen 2003). The decision to drive rather than walk may expose others to risk of injury from a collision.

Motorised transport in urban areas is associated with considerable costs. Congestion, poor air quality, collisions and physical inactivity in English urban areas each cost around £10 billion a year (Department for Transport 2009). The

cost of greenhouse gas emissions and the annoyance associated with noise are smaller, but still significant. In the case of greenhouse gases, costs are expected to rise sharply in future years (Department for Transport 2009).

Interventions to promote walking or cycling may have an impact on health inequalities. For instance, the change experienced as a result may vary for people with limited mobility. Ensuring planning decisions improve access on foot or by cycling may help those who are unable to drive. Changes in vehicle use may alter the risk of injury – which itself varies significantly according to people's socioeconomic background. As exposure to air pollution also varies across the social gradient, so changes in the level of pollutants may be more significant for some groups than others.

## Aims and objectives

The aim of this review was to identify evidence to address the research questions relating to views about walking and cycling.

The objectives were:

- to develop and implement a focused search strategy
- to search relevant databases
- to retrieve relevant evidence
- to synthesise relevant evidence

**Research questions:**

**Question 1: What factors help or hinder the planning and delivery of walking and cycling-related interventions for recreation or travel purposes?**

**Question 2: What factors help or prevent people from walking and cycling for recreation or travel?**

## Methods

Searches were initially based on an iterative search strategy that included effectiveness evidence. Focussed searching was then carried out to identify further studies that were relevant to the qualitative review. Included papers were

quality assessed and data extracted, in line with the NICE methods (NICE 2009) and Sanderson *et al* (2007). Qualitative findings relevant to the research questions were coded, and thematically structured (Thomas & Harden 2008) in order to inform questions about barriers and facilitators to intervention delivery and intervention utilisation as well as walking and cycling for transport and leisure.

**Summary of study identification**

All search results were downloaded to Reference Manager. Potentially relevant papers were identified through the initial search, and full papers were obtained. A further search focussed on barriers and facilitators to walking and cycling was developed for this review. Citation searching of key papers as well as scrutinising reference lists and author searching was also carried out.

**Summary of identified research**

In total 47 papers describing 46 studies were selected for inclusion in the review. 33 papers were identified through the initial database searches, 9 were supplied by stakeholders, 2 through additional searches, and 3 were identified through scrutinising reference lists. A list of included studies is given in Appendix 3.

34 studies reported in 35 papers used qualitative methods, mainly focus groups (n = 17), semi-structured interviews (n = 17), participant observation (n = 2), diaries (n = 1) and action research (n = 1) or a combination. One study presented qualitative findings from an RCT. One focus group study used the 'photo-voice' method to encourage discussion. In the context of this review, this involved participants taking photographs of salient areas in their neighbourhood that they regard as positive or negative in terms of impacting on mobility.

A further 12 studies utilised cross sectional methods to obtain data.

Twenty five studies were based in the UK, eleven in the US, seven in Australia and three in Canada. Four studies were concerned with the views of providers and researchers involved in organised interventions, and twelve studies were

concerned with the views of intervention participants (10 walking and 3 cycling). Of these, two studies assessed the views of both providers and users.

Two studies elicited views from employers or employees about workplace interventions. Four studies included female-only populations, two of which studies focused on African American women.

Twelve studies assessed barriers and facilitators to walking for travel or leisure (2 with young people, 2 with adults, 6 with older adults and 2 with disadvantaged mothers). Ten studies explored factors that influence active travel to school, four of which included parental views. Four studies assessed the shared use of walking and cycle trails, and five studies explored cycling for adult transport, one of which included the views of other road users.

**Summary of findings**

In total 47 papers describing 46 studies using a range of study design were selected for inclusion in the review.

For those organising interventions, evidence was only available for facilitators and barriers to implementing walking interventions. Organising walking groups can be motivated by the personal benefits of walking and by a sense of helping others. However, some issues that may require attention when designing programmes are planning time, collaborative issues where associations are working together, and the involvement of staff at the planning stage. Where groups or associations are collaborating, having one person to co-ordinate between different stakeholders facilitates implementation. The burden of recruitment and how this might be facilitated, for example through marketing training, is also a factor. Sole responsibility for designing walking routes and for the safety of others might be lessened by involving other walking group members and other walking groups.

Whilst a number of benefits from walking were cited, people may not be sufficiently motivated to walk outside of a group. Participation in walking groups

can enhance motivation through having role models, and through the social interaction that is associated with groups. Social interaction was a particularly important aspect of walking interventions for older adults, women and families. Family based interventions can stimulate the enjoyment of walking in children and families. Having organised routes to walk can also be motivating. Self-monitoring and pedometer use may be motivating in some individuals or groups though acceptability of the element of competition needs to be considered.

Maintaining interest in walking may be achieved by using incentives, or through support from peers and family. There is a particular need to find ways of integrating walking into daily life, particularly for younger groups that have family and work commitments. Other barriers include physical and psychological limitations. Overcoming barriers can involve re-examining time management and involving the family as well as having a positive attitude to the activity.

Participating in cycling interventions can be facilitated by providing adequate facilities such as secure storage, showers, and changing facilities at schools and workplaces. This is particularly important as many journeys involve cycling for some distance. For young people a fun aspect is required, as well as a social element. Image concerns are also salient for this population.

Outside of organised interventions, walking for travel or for leisure is deterred by lack of time in younger people, and for men, by a lack of belief in walking as a form of exercise. For older adults, safety issues are important, with fears of falling related to inconsistent external environments. The social aspect of walking is also important, particularly post-retirement. Indoor walking is one way of achieving a safe and social setting for walking.

People living in deprived areas may be de-motivated from walking due to neglected local environments. Individuals may thus get out of the habit of walking, and motivators are required to alter this situation. However, walking with small children for long distances is enforced for some women in these areas.

For schoolchildren and their parents, walking or cycling to school is perceived to have health and social benefits. However there are also perceived dangers from busy roads as well as strangers and older children. The distance required to travel, as well as the lack of convenience when several children need to be at school at the same time can also deter active travel. Fear of having a bicycle stolen, and having to carry heavy bags are also barriers. Barriers could be overcome by school based strategies that encourage and develop awareness as well as support active travel.

Shared trails for walking and cycling are valued for the opportunity to walk and cycle in a traffic free environment. However, concerns by walkers that cyclists in these environments are mainly cycling for sport, and could pose a danger to walkers. In addition, walkers perceived risks of crime and attack at times when trails were quiet. Some may feel intimidated by youths in the area.

Cycling to work has reported health benefits to the individual as well as being an environmentally friendly, efficient way of travelling through traffic. However, many people that own cycles do not use them and lack confidence, particularly if there are barriers such as hilly terrain and/ or a lack of suitable cycle lanes. Cycling is often marginalised, partly because of a perceived image of cyclists as inconsiderate or in some way different, but also because cyclists are competing for space against vehicles that provide more protection to their drivers than do bicycles. Cycling also requires that bicycles are stored securely, and that provision is made for showering and changing clothes at work. Women and ethnic groups are less well represented as cycling commuters, though resistance is beginning to occur among some female groups to allow the integration of feminine expression and cycling.

**Applicability in the UK context**

More than half of the included studies were carried out within the UK. Within the UK, walking and cycling facilities vary across geographical locations, and feasibility may be restricted by terrain. In addition, deprived areas may be less attractive to negotiate on foot or by cycle. Interventions also need to take into

account the target population; findings show that barriers to walking and cycling differ by age, gender and ethnicity.

Findings from studies carried out in countries other than the UK may be applicable to UK settings where geographical areas and populations are similar. Some general differences need to be taken into account. Weather conditions may be better, or more extreme, in the US, Canada and Australia than in the UK, therefore presenting a lesser or greater barrier to those attempting to be active outdoors. In the US, pavements may be less accessible for walking, and wildlife in some countries may be more of a threat than in the UK. A number of US studies focused on African American population, whose beliefs around lifestyle choices may differ to those of ethnic groups within the UK.

**Implications of the review findings**

Findings show that interventions for walking and cycling require understanding of population groups and their requirements. For some, mainly younger people and males, an element of competition is motivating. For children, older people and females, social interaction and safety are major considerations.

For schoolchildren, safe active travel may be encouraged by awareness raising and by forming educational groups at school. In addition, family-based interventions encourage parents to walk with their children and children to enjoy walking. Cycling requires adequate competence as well as facilities for storage and changing. Cycling identities need to be addressed to encourage equal participation between population groups.

## Evidence Statements

### Question 1: What factors help or hinder the planning and delivery of walking and cycling-related interventions for recreation or travel purposes?

**ES1. Providers' and researchers' views of barriers and facilitators to planning and delivering interventions to increase walking.**

**Moderate evidence from four studies suggests that facilitators to planning and delivering interventions included organisational support and sufficient planning time. It may be beneficial to include volunteer leaders at the planning stage.**

**Having previous experience in marketing and a conceptual framework facilitated recruitment efforts. Personal satisfaction, social interaction and a positive rapport with group members were motivational effects of leading walking groups.**

**Barriers to planning and delivery included lack of inter-organisational collaboration. This was facilitated by introducing staff in different organisations to each other and being clear about shared goals. Employing an individual to co-ordinate between organisations was a facilitator to implementation.**

**De-motivators to being involved in organising and monitoring groups included researchers' perceived workload, efforts required for effective recruitment, lack of support from and feelings of responsibility for group members.**

**Milton *et al* (2011 Evaluation UK +)** suggested that sufficient planning time is required for successful implementation of a family-based intervention. Involvement of proposed walking leads at the planning stage was suggested as a way of increasing their engagement with the programme.

**Nguyen *et al* (2005 pilot evaluation + US)** reported that walking group policy makers supported the walking group by promoting the intervention and assisting with recruitment. Administrative support was also supplied, and events were organised.

**Matthews *et al* (no date; interviews + UK)** reported that the process of recruiting members to a walking group was draining on time and resources for the organisers, and some volunteers lacked skills in recruitment. Having experience in marketing and a conceptual framework around recruitment was a facilitator to recruiting new members. However, word of mouth was regarded as the most effective recruitment strategy.

**Nguyen *et al* (2005 pilot evaluation + US)** reported that running the walking group provided a sense of personal satisfaction for organisers as well as an opportunity for personal development and health promotion. Interaction with club members was a motivator for organisers.

Collaboration with other organisations was an issue in two studies (**Nguyen *et al* (2005 pilot evaluation + US; Milton *et al* 2011 Evaluation UK +),** due to a focus on their own organisation and lack of communication. In one study (**Nguyen *et al* 2005 pilot evaluation + US)** this meant that walking routes were not shared and events were less well attended. Club directors could also feel isolated. In the other study (**Milton *et al* 2011 Evaluation UK +),** collaboration between a walking association and a family support group was improved through members getting to know each other and being clear that goals were to be shared, and that interventions would run alongside each other rather than new initiatives replacing existing ones. Co-ordination by one designated officer also facilitated implementation.

**Nguyen *et al* (2005 pilot evaluation + US** reported that group organisers expressed views about their burden of responsibility for the well-being and safety of members, especially if leadership was not shared. Recruitment and maintenance of membership numbers were regarded as a burden, and strategies were developed by the club to limit drop out. Having to walk at a slow pace with other members was a de-motivator.

**Shaw *et al* (2011 interviews + UK)** found that carrying out routine physiological measurements in a pedometer study was regarded as a burden for researchers.

***Applicability:*** *Findings from these studies have partial applicable to other walking groups. The organisation of walking interventions will differ across countries, regions and groups. Groups may have different goals, and recruit specific populations. There is no reason to believe that the barriers and facilitators described are not applicable to other similar interventions.*

**ES2 Participants' views about motivators and barriers to participating in interventions to increase walking**

**Moderate evidence from five studies suggests that participating in a walking intervention motivated people to walk through the presence of role models, organised routes, and the support of being part of a group.**

**Families were motivated by the opportunity for children to participate in an activity that was free of charge. For others, the opportunity to improve health and enjoy fresh air and nature were motivational.**

**Barriers to motivation include conflicts between walking activities and work / school schedules, and cultural lack of acceptance in regard to work-based activity.**

**Nguyen *et al* (2005 pilot evaluation + US)** reported that having access to a role model and to organised walk routes were motivators to attendance. For women, having the support and security of a group was a motivator **(Burroughs *et al* 2006 focus groups ++ US).** For families, the opportunity for children to participate in activities with the family, free of charge, and outside of nursery hours were incentives **(Milton *et al* 2011 Evaluation UK +).** For adults, a sense of routine and structure was valued for those who were not in employment **(Hynds & Allibone 2009 focus groups + UK).**

Participants in one study were motivated by the opportunity to improve their health and be out in the fresh air and natural environment **(Hynds & Allibone 2009 focus groups + UK).**

However, barriers to participation included conflicting schedules with school attendance (**Milton *et al* 2011 Evaluation UK +)** or workplace responsibilities **(Gilson *et al* (2008 interviews + UK).** In a workplace setting, **Gilson *et al* (2008 interviews + UK)** also reported that increasing walking time required acceptance from colleagues, and this varied depending on the status of the employee within the organisation.

***Applicability:*** *The findings from these studies are applicable to other walking groups. The acceptability of walking interventions will depend upon specific walking group characteristics, settings and aims. There is no reason to believe that the barriers and facilitators reported are not applicable to interventions implemented in the UK.*

**ES3 Participants' views about maintaining participation in interventions to increase walking**

**Moderate evidence from ten studies provided evidence regarding factors associated with maintenance of participation.**

**Social interaction and social support were major factors in maintaining participation. Maintenance was also related to the extent to which activities could be integrated into daily life.**

**Monitoring activity, providing people remembered to self-monitor, could increase motivation, though it could also introduce unwanted competition between members.**

**Other motivators included variation in walking routes, and incentives such as gifts.**

**Barriers to maintenance included the difficulty of integrating walking and attendance at clubs into daily routines. Boredom, dissatisfaction with elements of the club, and incongruent aims were reported factors associated with discontinued membership.**

The social factor associated with walking in groups was supported by **Shaw *et al* (2011 interviews + UK)**, **Nies & Motyka (2006 RCT+ US)**, **Milton *et al* (2011; Evaluation UK +), Dunn (2008 focus groups + US), Hynds & Allibone (2009 focus groups + UK)** and **Copleton (2009 observation and interviews + US).** The social factor was particularly strong for women and older adults. **Hynds & Allibone (2009 focus groups + UK)** reported a strong bond and sense of loyalty to the group that facilitated attendance. For men, the social factor was not so important with males tending to prefer walking alone **(Burroughs et al 2006 focus groups ++ US).**

Support was also important; in one intervention (**Burroughs *et al* 2006 focus groups ++ US),** feedback from providers was welcome, though e-mail was the preferred mode.

**Nies & Motyka (2006 RCT+ US)** highlighted the importance of family and friends in supporting the maintenance of walking behaviours. Walking also had a positive effect on interactions with family members.

**Gilson *et al* (2008 interviews + UK)** reported that walking to deliver messages at work instead of e-mailing created a greater sense of community.

An important aspect of walking was the ability to integrate interventions into daily life. The ability to turn up without booking was a positive factor for some, and a sense of routine and structure was valued for those who were not in employment **(Hynds & Allibone 2009 focus groups + UK).**

However, **Shaw *et al* (2011 interviews + UK)** reported that women in particular found difficulty integrating extra walking into daily routines. Life changes, coinciding schedules and other commitments were also a barrier (**Nguyen *et al* 2005 pilot evaluation + US; Nies & Motyka 2006 RCT+ US; Dunn 2008 focus groups + US; Hynds & Allibone 2009 focus groups + UK).** Wearing female-oriented clothing such as high heels was a barrier to walking whilst at work **(Gilson *et al* 2008 interviews + UK)**. **Nguyen (2005 pilot evaluation + US); Nies & Motyka (2006 RCT+ US)**, For African American women, it was difficult to focus on self-based activities **(Dunn 2008 focus groups + US).**

Monitoring activities was reported as a motivator. **Shaw *et al* (2011 interviews + UK)** and **Zoellner *et al* (2009 focus groups and diaries + US)** reported that pedometer use and the process of self-monitoring increased walking behaviours. **Hynds & Allibone (2009 focus groups + UK)** reported that step counting gave a sense of achievement.

However, **Copleton (2009 observation and interviews + US)** found that in older adults (mainly female), pedometer use and fitness objectives conflicted with the moral economy (shared values regarding social interaction) of the walking group, which was based on sociability rather than competition. In addition, people often forget to complete logs, or to use their pedometer **(Zoellner *et al* 2009 focus groups and diaries + US).**

Other incentives included rewards and gifts (**Burroughs *et al* 2006 focus groups ++ US)**.

**Nguyen *et al* (2005 pilot evaluation + US)** reported that the atmosphere of the club, mismatch between aims of the club and aims of the participant, as well as the pace required to walk could be barriers to participation in walking interventions. **Shaw *et al* (2011 interviews + UK)** also added that boredom could dissuade attendance, and for African American women, **Dunn (2008 focus groups + US)** reported lack of objectives as potential barriers.

***Applicability:*** *The findings from these studies are applicable to other walking groups. The motivation to maintain walking behaviour within an intervention will depend upon individual circumstances and requirements as well as the characteristics and aims of the club. There is no reason to believe that the barriers and facilitators reported are not applicable in the UK.*

**ES4 Participants' views of the benefits of participating in a walking intervention**

**Moderate evidence from eight studies highlighted the reported benefits of walking as part of a walking intervention.**

**Perceived benefits to walking were reported to facilitate motivation and hence walking behaviour (Dunn 2008 focus groups + US). Such benefits could be emphasised when encouraging participation in interventions.**

**Reported benefits included physical and psychological benefits, adding variety to the day and getting out of the house or office. Walking could provide a sense of peace and solitude, and was also fun, providing an opportunity to be out in fresh air and see the sights.**

Reported physical benefits were feeling healthy **(Dunn 2008 focus groups + US); Burroughs *et al* (2006 focus groups ++ US),** and fit **(Nguyen (2005 pilot evaluation + US); Nies & Motyka (2006 RCT+ US)**, increased energy **(Gilson *et al* 2008 interviews + UK; Nies & Motyka (2006 RCT+ US)**, lower blood pressure **(Nies & Motyka 2006 RCT+ US)**, weight loss **(Nies & Motyka 2006 RCT+ US; Dunn 2008 focus groups + US)** and improved body shape **(Dunn 2008 focus groups + US).**

Psychological benefits included enhanced mood **(Gilson *et al* 2008 interviews + UK; Nies & Motyka 2006 RCT+ US),** stress reduction **(Nies & Motyka 2006 RCT+ US); Dunn 2008 focus groups + US; Burroughs *et al* (2006 focus groups ++ US),** mental and emotional satisfaction **(Nies & Motyka 2006 RCT+ US)**, feeling rejuvenated **(Nies & Motyka 2006 RCT+ US)**, and having meditative or spiritual feelings **(Dunn 2008 focus groups + US).** Feeling tired at the end of a walk was associated with a sense of achievement **(Hynds & Allibone 2009 focus groups + UK).**

In a workplace intervention, walking was reported to add variety to the day and improved output at work **(Gilson *et al* 2008 interviews + UK)**. For a group of previously sedentary adults, walking became fun, and was a chance to get out of the house **(Nguyen 2005 pilot evaluation + US).** Walking for one group of mid-age women allowed them time to think, time out of the office, time with the family and fresh air **(Nies & Motyka 2006 RCT+ US).**

Benefits reported from two pedometer based interventions included seeing the sights **(Shaw 2011 interviews + UK),** and socialising with members of the group **(Copleton 2009 observation & interviews + US).**

***Applicability:*** *The findings from these studies are applicable to other walking groups. Benefits of walking may differ by setting, though there is no reason to believe that the benefits reported are not applicable in those settings within the UK.*

**ES5 Walking intervention participant's views of perceived barriers to walking.**

**Moderate evidence from seven studies highlighted perceived barriers to walking for participants of walking interventions. These included physical and psychological limitations, environmental barriers, and poor weather conditions.**

Physical barriers to continuing with the walking programme included health problems such as arthritis **(Dunn 2008 focus groups + US)),** and physical limitations such as illness and injuries **(Nies & Motyka 2006 RCT+ US)**. Tiredness and depression also prevented some women from continuing attendance **(Dunn 2008 focus groups + US).**

Poor weather conditions or hot weather were reported disincentives to walking **(Shaw 2011 interviews + UK; Nguyen *et al* 2005 pilot evaluation + US; Nies & Motyka 2006 RCT+ US; Dunn 2008 focus groups + US; Burroughs *et al* 2006 focus groups ++ US; Hynds & Allibone 2009 focus groups + UK).** One study reported costs of participation as a barrier **(Nguyen *et al* 2005 pilot evaluation + US).**

Lack of access to the walking route, and obstacles such as poorly maintained stiles along the walking route were also reported barriers **(Hynds & Allibone 2009 focus groups + UK)**

***Applicability:*** *The findings from these studies are applicable to other walking groups. The barriers to participation in walking interventions might depend upon individual circumstances, such as age and physical fitness as well as seasonal weather conditions. Weather conditions may be better, or more extreme, in the US, Canada and Australia than in the UK, though there is no reason to believe that the barriers reported are not applicable in the UK.*

**ES6 Suggested strategies to overcoming barriers to maintaining walking in a walking intervention**

**Moderate evidence from two studies highlighted reported strategies to overcome perceived barriers to participating in walking interventions. These included making time, and integrating walking into daily life as well as thinking positively.**

**(Nies & Motyka 2006 RCT+ US)** reported strategies including scheduling time to walk, problem solving and using motivators such as positive thinking and focusing on the long-term benefits. Goals were more achievable if walking was made a priority and was fitted into daily life as much as possible. Similarly, **Dunn 2008 (focus groups + US)** reported that for African American women, weaving walking into family life was a strategy that allowed themselves and the family to participate.

***Applicability:*** *The findings from these studies are applicable to other walking groups. The ability to implement strategies to overcome barriers to participation in walking interventions will depend upon individual circumstances.*

**ES7. Providers' views about effective intervention components that motivate walking and cycling**

**Moderate evidence from one study suggests that workplace efforts to encourage walking and cycling are most successful where they attend to cultural attitude, access, security and available facilities. Incentives and provision of equipment are also motivating.**

One study **(Cairns *et al* 2010 survey and interviews + UK)** provides evidence that, across 20 workplace initiatives, walking and cycling are increased where good on-site and offsite access is available, along with provision of showers, drying and changing facilities. Organised walks at lunchtime and cycling groups were an incentive.

Organisational attitude was important, with some workplaces marketing the benefits of walking to staff. Motivators such as complementary products or financial incentives were used.

For cycling, the ability to borrow equipment or receive discounts on cycling equipment was important, as was having secure parking for cycles.

***Applicability:*** *Findings from this study were taken from a range of workplace initiatives within the UK and so are applicable in UK workplace settings.*

**ES8. Provider views reporting barriers and facilitators to planning and delivering interventions to increase cycling.**

**No evidence was found for provider views reporting barriers and facilitators to planning and delivering interventions to increase cycling.**

**ES9. Participants' views about taking part in interventions to increase cycling**

**Moderate evidence from one exploratory study and one evaluation showed that facilitators to a led cycling intervention were a feeling of safety and acceptance that was obtained from cycling in a group.**

**Provision of acceptable equipment and the need not to wear a helmet was a facilitator for boys.**

**In a workplace based cycling intervention, facilitators included the provision of storage and changing facilities and raised awareness about benefits.**

One exploratory study **(Cavill & Watkins 2007 focus groups ++ UK)** elicited community members' views about use of a cycle trail and a proposed intervention that included led cycling groups.

The main facilitator to using the trail for led cycle groups was the protection of riding together in a group. For young women, the image of cycling as 'uncool' was an issue, but this barrier would be lessened if they were cycling with friends.

Image was also an issue for boys, whose participation would be facilitated by the provision of the 'right' bike, and not having to wear a cycling helmet.

**Cleary *et al* (2000 survey evaluation + UK)** found that the main influences on increase in cycling following an intervention were the provision of workplace cycling facilities, a house or job move that made cycling more attractive, and heightened awareness of the importance of physical activity for health. Welcomed and best used measures were secure cycle parking, showering and changing facilities, and cycle purchase loans.

***Applicability:*** *The findings from these UK based studies are applicable to other potential cycling interventions. The motivation to participate in cycling interventions might depend upon individual circumstances, as well as local geography and usage of the proposed site. Some areas of the UK may be more or less attractive as cycling venues than the one described here. Workplaces will also differ in provision of facilities, and interventions may be affected by factors outside the control of organisers, such as weather conditions.*

### 7.2 Question 2: What factors help or prevent people from walking and cycling for recreation or travel?

**ES10. Young people's views about walking for travel or leisure (not related to an intervention)**

**Moderate evidence from one interview study and one survey study suggests that walking for leisure was facilitated by walking as a social event or as part of a challenge.**

**Barriers to walking for travel or leisure for young people are mainly related to lack of time. In addition, having a lot to carry and wearing shoes that were not comfortable were disincentives. Young people report busy lives as a barrier to walking for transport. For men, walking was not sufficiently vigorous to be considered 'exercise'.**

**Darker *et al* (2007 interviews ++ UK)** reported that young people, and especially young men, did not regard walking as vigorous enough to provide exercise. Walking for transport required too much time out of a busy day. Walking for leisure was only acceptable if it included some form of team-work or challenge. For those that did walk for transport, listening to music was a facilitator as it drowned out noise from traffic and construction sites.

**Dunton *et al* (2006 survey + US)** reported that undergraduates found that lack of time, having a lot to carry, and wearing shoes that were uncomfortable were the most highly rated barriers.

***Applicability:*** *The findings from these studies are applicable to young people in the UK and US. Evidence reflects aspects of daily life that alter with changes through the life course. Participants in this study are constricted by timescales associated with the working day that might not apply to some other populations. There are also specific gender differences in perceptions of walking for fitness.*

**ES11. Adult views about walking for travel or leisure (not related to an intervention)**

**Moderate evidence from two survey studies suggests that the main barriers to walking for travel or leisure for adults are related to time constraints, lack of support and lack of motivation. Women were more likely to cite medical reasons for not walking, whilst men were more likely to cite being too busy.**

**Cerin *et al* (2010 survey + Australia)** found that adults aged 20-65 years, related lack of motivation, lack of social support, and time constraints as

negatively related to weekly walking for recreation. Non-participation was predicted more highly by poor health, lack of motivation and lack of facilities than lack of skills or knowledge. **Soh *et al* (2006 survey + Australia)** reported that anaesthetists' main reasons for carrying out regular physical activity were maintenance of physical health and weight control, whilst reasons for not exercising regularly included fatigue, being too busy, having family commitments and lack of interest. Women were more likely to cite medical reasons and men were more likely to report being too busy.

***Applicability:*** *The findings from these studies are applicable to adults in Australia. The evidence reflected concerns that alter with changes through the life course such as family and work commitments.*

**ES12. Older people's views about walking for travel or leisure (not related to an intervention)**

**Moderate evidence from six studies suggests that the main facilitator to walking for travel or leisure in older adults was social interaction.**

**Barriers to walking for travel or leisure for older adults are related to limited mobility and fears for safety. These factors were mediated by the external environment, with fears of falling or of swift traffic being commonly voiced.**

**Walking indoors was a relatively safe and comfortable alternative if designed appropriately. Walking indoors also incorporated a social aspect to walking.**

Older adults reported factors that impacted on safety as the main barriers. When walking outside, narrow pavements and obstacles such as parked cars on pavements, and construction sites were barriers to access **(Newton *et al* [no date] interviews - UK)**. Traffic was also an issue, with cycle tracks and bus lanes creating hazards. Suggested improvements were wider pavements and better provision for cyclists.

In addition**, Lockett (2005 focus groups ++ Canada)** and **Ripat *et al* (2010 focus groups + Canada)** reported that fear of falling was a barrier to older adults, particularly in icy weather. Uneven pavements and car parks that are not designed for pedestrians were hazards. Older adults often require more time to cross roads, and it was reported that fast roads and poor visibility at crossroads were barriers to outdoor walking.

Suggestions for improving the walking experience for this group were access to toilets and seating, as well as adequate access to local amenities and pedestrianised shopping areas. Making sure that pavements were smooth and clear of snow and ice was also a factor **(Lockett 2005 focus groups ++ Canada).**

**Mackett *et al* (survey 2001 + UK)** reported that obstructions to mobility included crossings without dropped kerbs, narrow footpaths, and a dropped curb with a steep angle. The authors report that 19% of people aged >80 years could not reach key places if they need to pass through a gap of 1000mm.

Two studies assessed indoor walking for older adults. **Duncan *et al* (1995 observations & interviews ++ US)** reported on mall walking that not only contributed to improved physical activity, but also provided a social network and a meaningful work replacement following retirement. Routines were adapted and events were organised in a relatively safe environment compared to outdoors.

For older adults in assisted living facilities, **Lu *et al* (2011 focus groups ++ US)** reported similar facilitators in corridor walking, such as relative safety of being indoors, and the social incentive of meeting people in the corridors. Handrails were valued, as well as appropriate flooring, seating in corridors and adequate toilet arrangements. Public rooms needed to be thoughtfully placed to allow residents optimum access.

Reported barriers to this activity **(Lu *et al* 2011 focus groups ++ US)** were the lack of varied things to see compared with outside. Facilities with outdoor walking areas provided an opportunity to overcome this barrier providing the walking surfaces were adequate.

***Applicability:*** *The findings from these studies are applicable to older adults in the UK and North America. The evidence reflected safety concerns that alter with changes through the life course such as ageing. Participants in this study were constricted by limited mobility that might not apply to some other populations. Social interaction is important for this population to prevent social exclusion.*

**ES13. Views of people from deprived areas about walking for travel or leisure (not related to an intervention)**

**Moderate evidence from two studies suggests that the main barriers to walking for travel or leisure in people from deprived areas were safety, lack of time and lack of motivation.**

**Women were constricted by perceived dangers from the external environment, family commitments, lack of motivation and lack of walking companions.**

**There was evidence that participants were either out of the habit of walking, or that walking was enforced due to a lack of options.**

**For men, walking was not sufficiently vigorous to be considered 'exercise'.**

Two studies assessed the views of populations from deprived groups. One study **(Ipsos / MORI [unpublished report] interviews + UK)** reported that males did not associate walking with exercise as it is not strenuous enough. Women more often preferred to walk with someone else rather than alone, so walking with a friend, or children was an incentive. Walking with a dog was a motivator for men or women.

Though health benefits such as weight management and reducing aggression or boredom were recognised by those that did maintain walking activities, there was a habit of not walking that needed to be broken. Lack of motivation, other commitments, lack of time and bad weather were all barriers to continuing walking **(Ipsos / MORI [no date] interviews + UK).**

**Bostock (2001 interviews + UK)** examined the experiences of women without access to a car and reported feelings of social exclusion due to having to walk in neglected areas and often with very young children, who were tired. Women often had to walk long distances to shops, and feared for their children's safety at busy roads.

***Applicability:*** *The findings from these studies are applicable to people living in deprived areas in the UK. The evidence reflected safety concerns associated with perceived environmental dangers. Participants in this study were constricted by reduced options that might not apply to some other populations. Social interaction is important for this population to increase the feeling of safety, particularly for women. There were also specific gender differences in perceptions of walking for fitness.*

**ES14. Adult views about walking or cycling for leisure or travel**

**Strong evidence from one study highlights the complex nature of transport choices, particularly for those with a family.**

**Pooley *et al* (2011 survey & interviews ++ UK)** found that people are more inclined to walk than to cycle, even if they own a bicycle. Major constraints to walking and cycling are the need to transport family members, particularly the very young and elderly.

Walking for leisure was often preferred to walking for transport because it is a way of relaxing, whereas walking for transport takes too long when there are time constraints.

Cycling also demands secure storage and regular maintenance as well as a degree of confidence.

***Applicability:*** *Findings from this study are applicable to people living in the UK contemplating walking or cycling for transport or leisure. There are particular complexities for people who have a family to transport.*

**ES15. Views about barrier and facilitators to active travel to school (walking and / or cycling for transport)**

**Moderate evidence from nine studies suggested that the main facilitators to active travel included the social aspect of walking and spending time with friends, or having quality time with parents.**

**Barriers for schoolchildren contemplating active travel to and from school were parental and children's lack of time and perceived dangers from traffic and from intimidation or attack by other people. The missed opportunity by schools to develop children's existing awareness, and displaying conflicting messages was also a barrier. Peer pressure was an important factor for this age group in terms of choices.**

**Other reported barriers included distance, carrying heavy bags, and poor weather conditions. Parental habits and commitments as well as fears for their children's safety were also influential on decisions about walking.**

**Barriers to cycling for children included a lack of cycle lanes and a lack of facilities to store bicycles.**

**The perceived image of cycling, and a dislike of wearing cycling helmets was also reported to be a barrier.**

*Walking or cycling*

Three studies **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US; Halden Consultancy 2003 survey & interviews + UK)** identified recognition in parents and children that walking or cycling would be beneficial to health and could increase a child's confidence and sense of independence around roads. In addition, two studies (**Kirby 2008 focus groups ++ UK; Granville *et al* 2002 focus groups + UK)** reported that walking with a parent provided valuable time together. Spending time with friends was an important social aspect for older children **(Kirby 2008 focus groups ++ UK).**

However, barriers to walking or cycling included lack of time **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US; Granville *et al* 2002 focus groups + UK; Halden Consultancy 2003 survey & interviews + UK)**; parents often needed to accompany children to different schools and arrive at their place of work in time. Children and parents would need to get out of bed much earlier in the morning in order to fit in walking. Laziness was reported as a reason for not using active travel **(Kirby 2008 focus groups ++ UK).**

Peer pressure and the trend toward car ownership was a factor, particularly for cycling, which for some groups was socially unacceptable. Schools may also miss opportunities to develop children's knowledge about sustainable transport choices **(Halden Consultancy 2003 survey & interviews + UK).**

**Beck *et al* (2008 survey + US)** and **Yeung *et al* (2008 survey + Australia)** found that among children that did not walk to school, distance was the most commonly reported barrier, followed by traffic danger. Parents restricted their children to playing close to home on their bicycles (**Davis & Jones 1996 / Davis 2001 focus groups + UK)**

Children having to carry heavy bags of books and equipment was a barrier to both walking and cycling **(Kirby 2008 focus groups ++ UK; Granville *et al* 2002 focus groups + UK; Halden Consultancy 2003 survey & interviews + UK)**, as were bad weather, dark mornings **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US; Granville *et al* 2002 focus groups + UK)** and hilly terrain **(Granville 2002 focus groups + UK)**.

For older children who travel without an adult, there were fears for personal safety **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US)**, of accidents and abductions **(Ahlport *et al* 2008 focus groups ++ US),** of strangers and bullies **(Davis & Jones1996 /Davis 2001 focus groups + UK; Granville *et al* 2002 focus groups + UK)** and of busy traffic **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US; Davis & Jones 1996 / Davis 2001 focus groups + UK; Granville 2002 focus groups + UK).** Environmental factors such as poor lighting, secluded areas or woodland on the journey exacerbated these fears **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US; Davis & Jones 1996 / Davis 2001 focus groups + UK; Granville *et al* 2002 focus groups + UK).**

**Ziviani *et al* (2004 survey + Australia)** showed that parental perceptions were a factor in decisions to walk. These included parents own physical activity habits, parental working schedules, and parental concerns about safety. Having to attend out of school activities was also a factor.

*Cycling*

Cycling was associated with particular barriers, such as lack of cycle lanes, and general support for cycling at school such as provision to store bicycles and helmets **(Kirby *et al* 2008 focus groups ++ UK; Granville 2002 focus groups + UK).** Fear of having a bicycle stolen was a disincentive **(Kirby *et al* 2008 focus groups ++ UK; Davis *et al* 1996 / 2001 focus groups + UK).**

The image that cycling conveyed was an issue for some. For teenage girls, cycling was perceived as childish **(Granville *et al* 2002 focus groups + UK).** For children that did cycle, the 'coolest' bike was required **(Granville *et al* 2002 focus groups + UK),** and cycling helmets were regarded as 'uncool' **(Kirby 2008 focus groups ++ UK; Stevenson & Lennie 1992 action research + Australia),** lacking in style and fit, with consequences such as negative comments from others **(Stevenson & Lennie 1992 action research + Australia).** In addition, cycling impacted on personal appearance; for example, cycling helmets dishevelled one's hair **(Kirby 2008 focus groups ++ UK).**

***Applicability:*** *The findings from these studies are partially applicable as the findings are specific to schoolchildren. Whilst some barriers and facilitators to active travel are applicable to any population, schoolchildren and their parents face particular issues pertaining to safety and practicalities for children. Some barriers differ by age group and gender.*

**ES16. Suggestions for strategies to encourage active travel to school (walking and / or cycling for transport)**

**Moderate evidence from five studies provided suggestions for strategies that might encourage safe active travel in schoolchildren.**

**Suggested strategies included environmental improvements to increase safety, changing attitudes to car use, school based campaigns to assist in cycling skills and awareness, and personal level encouragement by provision of storage facilities and better design of cycling helmets.**

Suggested strategies that may overcome some of the reported barriers included employing crossing patrols near to schools **(Ahlport *et al* 2008 focus groups ++ US),** escort schemes, traffic calming schemes, and pedestrian training **(Granville *et al* 2002 focus groups + UK)**.

**Black *et al* (2001 survey + UK)** reported that modifying attitudes to car-centredness would be a useful policy; more so than promoting general environmental awareness.

To reduce cycling accidents, improved cycle paths and compulsory helmet wearing was suggested in one study **(Stevenson & Lennie 1992 action research + Australia).**

Other suggestions included schools organising walking and cycling groups, providing training in cycling proficiency, and support such as storage for wet clothes and bicycles **(Kirby 2008 focus groups ++ UK; Granville *et al* 2002 focus groups + UK; Stevenson & Lennie 1992 action research + Australia).**

Improved design of cycling helmets might impact on their use and on cycling behaviour by children **(Stevenson *et al* 1992 action research + Australia)**.

***Applicability:*** *The findings from these studies are partially applicable as the findings are specific to schoolchildren. Whilst some suggestions to encourage active travel are applicable to any population, schoolchildren and their parents face particular issues pertaining to safety and practicalities for this age group.*

**ES17. Views about walking and cycling for leisure, utilising trails**

**Moderate evidence was found from four studies assessing the views of users, ex-users and non-users of walking / cycle trails.**

**Reported benefits of using trails included the ability to share space. Trails were reported to provide the opportunity to walk or cycle among nature, away from traffic and pollution.**

**Barriers include crowding at certain times, fear of accidents and fear of crime, particularly for women alone. Access to trails was a reported barrier for some, and there was evidence of lack of awareness about trails as a means of accessing the countryside. Challenging trails in good condition were preferred by mountain bikers.**

**Barriers to walkers and cyclists sharing the same space were reported. Walkers regarded their activity as partially social, whilst adult cycling was viewed as a sport. Non-users of trails reported perceived incongruence in walkers and cyclists sharing the same space.**

**Suggested ways to overcome safety fears included walking with others or with a dog.**

Users of the trails reported benefits such as being at one with nature **(Ravenscroft *et al* 2002 focus groups + UK)**, being able to escape from congestion and pollution, see wildlife, and either walk or cycle in a relatively safe, quiet and peaceful environment (**Ravenscroft 2004 focus groups + UK).** Experiencing fresh air and weight management were also reported benefits **(Cavill & Watkins 2007 focus groups ++ UK).**

**Siderellis *et al* (2010 survey + US)** found that mountain bikers preferred sites with higher quality trail conditions and more challenging routes.

However, in one study with potential trail users **(Cavill & Watkins 2007 focus groups ++ UK)**, there had been an apparent lack of awareness for some that they could access the countryside from the trail. Lack of nearby parking restricted access to trails **(Ravenscroft 2004).** Fears were expressed about traffic that might be encountered, as the trail does not run a continuous path. Some potential participants feared falling off the cycle, or of having their bike stolen **Cavill & Watkins 2007 focus groups ++ UK)**.

Users also reported disadvantages to using the trails, such as crowding on Sunday afternoons, inconsiderate users who shared the space, and the fear of accidents. In particular, walkers felt that cyclists might appear rapidly behind them on the path and this could be dangerous. Having someone to walk with was reported as important, particularly by women, in case of emergencies **(Ravenscroft *et al* 2002 focus groups + UK)**.

Fear of crime was also reported, particularly by women and ex-users of the trails. Poor lighting, being alone at night, the perception that gangs hang out in specific areas, and the availability of cover afforded by shrubbery exacerbated these fears (**Ravenscroft *et al* 2002 focus groups + UK; Ravenscroft 2004**

**focus groups + UK; Cavill & Watkins 2007 focus groups ++ UK).** Walking with other people or with a dog were suggested ways of overcoming these barriers **(Ravenscroft 2004 focus groups + UK)**

In terms of sharing space, non-users of the trails perceived sharing by walkers and cyclist to be incongruent, as cyclists are travelling faster for sport and walkers need to move out of the way for them. There was evidence of camaraderie among walkers, who could converse together, whilst cyclists reported a sense of 'otherness' **(Ravenscroft *et al* 2002 focus groups + UK).**

***Applicability:*** *The findings from these studies are applicable to people who use or may be considering using walking and cycle trails within the UK and US. Perceptions about shared use differed between types of user. There were gender differences in perceptions of safety.*

**ES18. Adult views about cycling for transport**

**Moderate evidence from five studies was available regarding barriers and facilitators to adult cycling for transport.**

**Benefits of cycling for transport were reported motivators, such as the ability to travel relatively quickly through traffic, the feeling of autonomy and freedom, and benefits for health and the environment. Cycling rather than driving could be encouraged by workplace initiatives.**

**Barriers to cycling were reported such as obstacles in the road, pollution and poor weather. Carrying bags and changes of clothing required after getting wet were also reported disincentives.**

**Cycling for transport requires negotiating space on the road; major barriers were traffic volume, inconsiderate driving and lack of adequate cycling tracks.**

**Some cycling behaviours were perceived as inappropriate by some other road users, giving cyclists a poor image and limited relationship with drivers.**

**Cycling was perceived as male, white and middle class. There was evidence that resistance to this image from female cyclists includes adopting and disseminating ideas for a feminine cycling image.**

Reported benefits from commuting by bicycle included swiftness of travel through busy traffic, not having to rely on public transport, and improved fitness (for men) or body shape (for women). An additional factor was reassurance that the environment is being protected (**Steinbach *et al* 2011 interviews + UK).**

Parents were reported to drive less to work when cycling was encouraged by their workplace **(Wen *et al* 2010 survey + Australia).**

However, cyclists in the city report a number of obstacles that can interrupt the journey, such as poor road surfaces, manhole covers, glass, rough gutters, hilly terrain, parked cars and buses. In addition, pollution and bad weather can be a disincentive (**McKenna & Whatling 2007 interviews ++ UK; Gaterslaben *et al* 2007 survey & interviews + UK)**. **Garrard et al (2008 survey + Australia)** reported that women cyclists preferred off-road paths compared to roads with no facilities, and off-road paths compared to on-road lanes.

Commuting by cycle often involved carrying extra clothes to work and extra time at work to get changed from cycling outfits to work attire, including re-structuring hair after wearing a helmet **(Steinbach *et al* 2011 interviews + UK).** Lack of available facilities was a barrier to cycling, as were saddle soreness and tiredness **(Gaterslaben *et al* 2007 survey & interviews + UK).**

Cycling on the road also requires negotiation with other road users. Cyclists reported fears of traffic and of accidents **(Steinbach *et al* 2011 interviews + UK)** which meant having to be constantly alert for other traffic in order not to collide, and feeling vulnerable when crossing traffic to turn right (**McKenna & Whatling 2007 interviews ++ UK)**.

Cyclists reported feeling segregated and invisible on the road (**McKenna & Whatling 2007 interviews ++ UK)**. In areas where cycling is traditionally less prominent, there was a 'strangeness' about cycling, which was internalised by cyclists. There was also a perception that cycling is a male (predominantly White) activity, and some women felt the need to construct their own cycling identity, which could mean resisting the 'blokey' image and embracing femininity (e.g. wearing heels whilst cycling; using blogs to reinforce identity) **(Steinbach *et al* 2011 interviews + UK).**

***Applicability:*** *The findings from these studies are applicable to cyclists who commute in the UK and Australia. Differences in experiences between cycling populations (gender, ethnicity, etc.) and between settings in their promotion and support of cycling need to be taken into account.*

**ES19. Views about cycling identities**

**Moderate evidence from one study that obtained car driver views of adult cycling identities.**

**Cycling for transport requires negotiating space on the road. Some cycling behaviours were perceived as inappropriate by some other road users, giving cyclists a poor image and limited relationship with drivers.**

Car drivers reported being fearful of collisions, since cars and cycles travel at different speeds, and gave cyclists a wide berth. Some cyclists were reported as behaving poorly on the roads, for example passing through red lights, and this contributed for some, to cyclists having a negative image. Drivers that cycled were more likely to have empathy with cyclists on the road. Cycling proficiency testing, road taxes and compulsory helmet wearing were suggestions for improving the status of cyclists on the road (**Granville *et al* 2001 focus groups & interviews + UK).**

***Applicability**: Findings from this study are applicable to car drivers in the UK. How cyclists are perceived by other road users and the impact that this may have for cyclists needs to be taken into account.*

# 3. INTRODUCTION

## 3.1. Aims and objectives

This review was undertaken to support the development of guidance on walking and cycling: local measures to promote walking and cycling as forms of travel or recreation, and aims to review the barriers and facilitators to implementation of interventions to promote walking and cycling as well as to walking and cycling for recreation or travel. This review will be supported by further work looking at evidence on the effectiveness of interventions and economic evidence.

## 3.2 Research questions

The two review questions were developed as part of the scope, rather than by the review team. It needs to be acknowledged that there is a conceptual overlap between the questions, in that the barriers and facilitators identified for question 2 will also relate to question 1. For clarity, however, we are treating the two questions separately when presenting findings. Question 1 will relate to walking and cycling interventions, whereas question 2 will be concerned with walking and cycling behaviour that is not part of an intervention.

**Question 1: What factors help or hinder the planning and delivery of walking and cycling-related interventions for recreation or travel purposes?**

**Question 2: What factors help or prevent people from walking and cycling for recreation or travel?**

## 4. BACKGROUND

Physical activity can help reduce the risk of coronary heart disease, stroke and type 2 diabetes by up to 50% and can promote mental wellbeing. However, many people aged 16 and over in England do not meet the national recommended levels (Craig *et al.* 2009). Recently revised physical activity guidance for adults is not being carried out optimally and the level of activity decreases with age in both adults and children (The Information Centre 2007). Black African and Asian adults and black Caribbean women are less likely to meet the recommended activity levels of physical activity than the general population (The Information Centre 2006).

Walking is reported to be the most common, and cycling the fourth most common recreational and sporting activity undertaken by adults in Britain (Fox & Rickards 2004). Among women of all ages, walking (for any purpose) is the most important way of achieving the recommended physical activity levels. Most trips carried out in Great Britain in 2009 are relatively short in distance, with 56% of car journeys less than 5 miles (Department for Transport 2010b). It is estimated that, on an average day in London, around 4.3 million trips are 'potentially cyclable' (Transport for London 2010). However, in Britain, the average time spent travelling on foot or by bicycle has decreased, from 12.9 minutes per day in 1995/97 to 11 minutes per day in 2007 (Department for Transport 2010c). Cycle use in Britain is lower than in other European Union (EU) countries, with an estimated 2% of journeys in Britain compared to about 26% of journeys in the Netherlands, 10% in Denmark and 5% in France (Ministry of Transport, Public Works and Water Management 2009).

Changes in the number of people walking and cycling could have an impact on health, the environment and the economy. These may be positive or negative, and can be experienced by individuals or populations. Positive outcomes include health benefits as well as travelling to local places and services that could in turn boost the economy. Walking and cycling may have unintended consequences; deciding to cycle might replace another more intense activity (such as going to the gym) which may result in an overall

reduction in physical activity. In addition, walking or cycling, rather than driving, may result in a different level of exposure to air pollution. Generally, cyclists and pedestrians experience higher rates of injuries than motorists (Department for Transport 2010b). However, there is also some evidence to support the hypothesis that increasing the number of cyclists reduces the risk of injury, possibly by making drivers and cyclists more familiar with each other (Jacobsen 2003). The decision to drive rather than walk may expose others to risk of injury from a collision.

Motorised transport in urban areas is associated with considerable costs. Congestion, poor air quality, collisions and physical inactivity in English urban areas each cost around £10 billion a year (Department for Transport 2009). The cost of greenhouse gas emissions is smaller, but still significant, and is expected to rise sharply in future years (Department for Transport 2009).

Interventions to promote walking or cycling may have an impact on health inequalities. For instance, the change experienced as a result may vary for people with limited mobility. Ensuring planning decisions improve access on foot or by cycling may help those who are unable to drive. Changes in vehicle use may alter the risk of injury – which itself varies significantly according to people's socioeconomic background. As exposure to air pollution also varies across the social gradient, so changes in the level of pollutants may be more significant for some groups than others.

## 5. METHODS

### 5.1 Search methods

The standard NICE Methods, as outlined in the Methods for the Development of NICE Public Health Guidance (2009) were used to guide the development of the search methods. The aim of the search strategy was to retrieve the best available evidence to inform the development of the qualitative review of barriers and facilitators.

This does not necessarily mean that all available evidence need be included. As Thomas & Harden (2008) state, for qualitative synthesis we are aiming for 'conceptual saturation', so that if the same concept is identified in a number of studies, the main consideration will be whether it differs according to context, and whether or not there is agreement across contexts. Supplementary searching for qualitative studies following assessment of studies from the main search is a way of identifying concepts in different contexts and following them through to 'saturation'.

An initial overarching search was undertaken at the outset of all reviews for this programme guidance. This search was generated by identifying concepts from the programme scope and from studies identified from key known literature as being relevant to the review questions. Free text and subject heading terms were then devised. A broad coverage of health and social science databases and transport specific databases were searched. The databases searched were: Medline and Medline in Process, CINAHL, Sociological Abstracts, Embase, ASSIA, British Nursing Index and Archive, The Cochrane Library, Science and Social Science Citation Indices, PsycINFO, The Transport Database, Social Policy and Practice and selected EPPI Centre Databases.

When designing the initial search strategy it became apparent that terms such as "cycle" or "cycling" retrieved a large number of irrelevant papers in medical and health databases (e.g. IVF cycles) even when employing techniques such as adjacency operators; therefore they were not used. Alternative terms such

as “biking” and “bicycle” were included as well as relevant subject heading terms. “Cycling” and “cycle” were used in Transport databases.

A further search was developed which focussed on barriers and facilitators to walking and cycling. Papers identified as relevant to the qualitative review from the initial search were examined to identify any additional terms or subject headings and used to create this search strategy. This search incorporated a qualitative study filter to limit the study type retrieved. The search was developed in conjunction with the NICE Information Specialist. The focussed search was undertaken in the following data sources: Cinahl, Medline and Medline in Process, Science and Social Science Citation Indices, The Transport database and Social Policy and Practice.

The papers identified as relevant to the qualitative review from the initial search were used to generate other potentially useful papers. We examined reference lists and undertook citation searches in Web of Science and author searches in Cinahl, Medline and Social Policy and Practice.

All searches were limited to English Language, 1990-current and human studies where data sources allowed.

A thorough audit trail of the search process was maintained; this includes all searches, number of results and number of relevant references identified. This process ensures that the search process is transparent, systematic and replicable.

Detailed information including location of websites and sample search strategies presented in Section 10.5 (Appendix 5).
Other sources of evidence were as follows:

- The PDG were asked for recommendations of articles, books, reports etc. which meet the scope of the systematic review;

- Evidence submitted by stakeholder call for evidence.

## 5.2 Inclusion and exclusion criteria

### Populations

Groups that will be covered: Everyone including, where the evidence permits, specific groups (for instance, those with impaired mobility) or those undertaking particular types of journey (for instance, journeys to work).

Groups that will not be covered: Disease rehabilitation studies conducted in populations with very specific conditions, which include walking and cycling interventions, but have outcomes related only to improvements in the disease condition.

### Activities/interventions

Activities/interventions that will be covered:

Local interventions which aim to raise awareness of, encourage or increase uptake of, walking and cycling for recreational and travel purposes and to improve general health. Also local interventions which aim to reduce the barriers to these activities. This will include those interventions targeted at particularly vulnerable and high-risk groups, where the evidence permits. Interventions aimed at individuals and those targeting population-level attitudes, norms and behaviour will be included, along with multi-component approaches that aim to do both. (The latter may include changes to the physical environment).

Interventions may include: a) Local, media-based activities (including broadcast, print, telephone, Internet and digital media) to raise awareness of the benefits and convenience of walking and cycling; b) Other local media-based activities that aim to change behaviour using accepted theories of behaviour change; c) Promotional activities, events and challenges (such as group rides, walking groups and events linked to sport); d) Resource provision (such as cycle hire, pedometers, cycle purchase schemes or safety equipment), e) Information resources (such as maps, route or travel plans,

road safety leaflets and personalised travel planning); f) Skills training (such as cycle training, organised rides or walks and safety tips); g) Integrated programmes combining environmental and behavioural interventions.
Note: 'local' may refer to a geographically defined area larger than that covered by a single local authority such as greater London, Manchester or Merseyside. It may also refer to a smaller area such as a housing estate or small town.

Activities/interventions that will not be covered:

a) National policy, fiscal and legislative changes. For example, fuel and vehicle duty, national speed limits and drink-driving or cycle-helmets legislation; b) Local interventions which solely aim to change the physical environment (such as traffic-calming measures, provision of cycling parking facilities or construction of cycle routes). These interventions have been considered in existing NICE guidance (public health guidance 8); c) Brief advice given in primary care to increase people's physical activity levels. This has been considered in existing NICE guidance (public health guidance 2); d) Interventions which solely report on sports-related outcomes, such as training programmes which report on someone's sport performance.

### 5.3 Data extraction strategy

Data relating to study design, outcomes and quality were extracted by two reviewers and each extraction was independently checked for accuracy by a second reviewer. Disagreements were resolved by consensus and consulting a third reviewer where necessary. The data extraction tables are presented in Appendix 1.

### 5.4 Summary of study identification

All search results were downloaded to Reference Manager. Potentially relevant papers were identified through the initial searches, and full papers were obtained. Citation searching of key papers as well as scrutinising reference lists and searching on key UK programmes was also carried out. Papers were also suggested by stakeholders. It is important to note that some

studies included in recent UK qualitative reviews of walking and/or cycling (e.g. Lorenc *et al* 2008) have not been included as they consisted of documents which could not be obtained or reviewed within the time/resources available (e.g. PhD thesis).

### 5.5 Quality assessment criteria for effectiveness studies

In addition to extracting key information from included papers, there was consideration of the study quality as per recommended NICE methods (NICE, 2009), and for cross-sectional studies, criteria based on Sanderson *et al* (2007). The criteria for assessment are given in Appendix 2. The studies were placed in one of three grades as follows based on the methodology checklist

**Table 1. Criteria used for study grading**

| Code | Quality criteria |
|---|---|
| ++ | All or most of the criteria have been fulfilled. Where they have not been fulfilled the conclusions of the study or review are thought very unlikely to alter |
| + | Some of the criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are through unlikely to affect conclusions |
| - | Few or no criteria fulfilled. The conclusions of the study are thought likely or very likely to alter |

For the purpose of generating evidence statements, evidence was graded as strong (mostly [++] studies), moderate (mostly [+] studies), weak (mostly [-] studies) or mixed.

### 5.6 Data analysis

Studies were categorised as to whether they related to question 1 or question 2 (though as we have previously pointed out, this distinction is mainly for structure, since there is overlap between the two). Studies were associated

with the first question if they included views about a specific walking and / or cycling intervention, for example, views of walking club directors or researchers that assist in implementing the intervention, or views of intervention participants, or those that decide not to take up an intervention. Studies were related to the second question if they included views about walking and / or cycling that was not related to an intervention, but was carried out (or not) as part of a lifestyle, for example, travelling to school or work, or for leisure purposes. Studies were further categorised according to the type and purpose of the intervention or activity, as well as the population being researched. Some studies included more than one population, or more than one activity.

Within this structure, thematic analysis was used to synthesise the findings of included studies (Thomas & Harden 2008). Extracted findings were coded line by line to identify key terms relating to the research questions. Descriptive themes were then identified that were common, or contradictory, across studies. Some responses relating to barriers and facilitators are directly requested during primary research (for example in evaluations), whilst some are inferred by the reviewers from responses (for example, expressions of the perceived of cycling in some populations).

Themes that were commonly reported across particular population groups or in specific settings were identified. Finally, analytical themes were developed in order to ‘go beyond’ each primary study toward a synthesis of relevant evidence to inform the research questions (Thomas & Harden 2008).

## 6. SUMMARY RESULTS

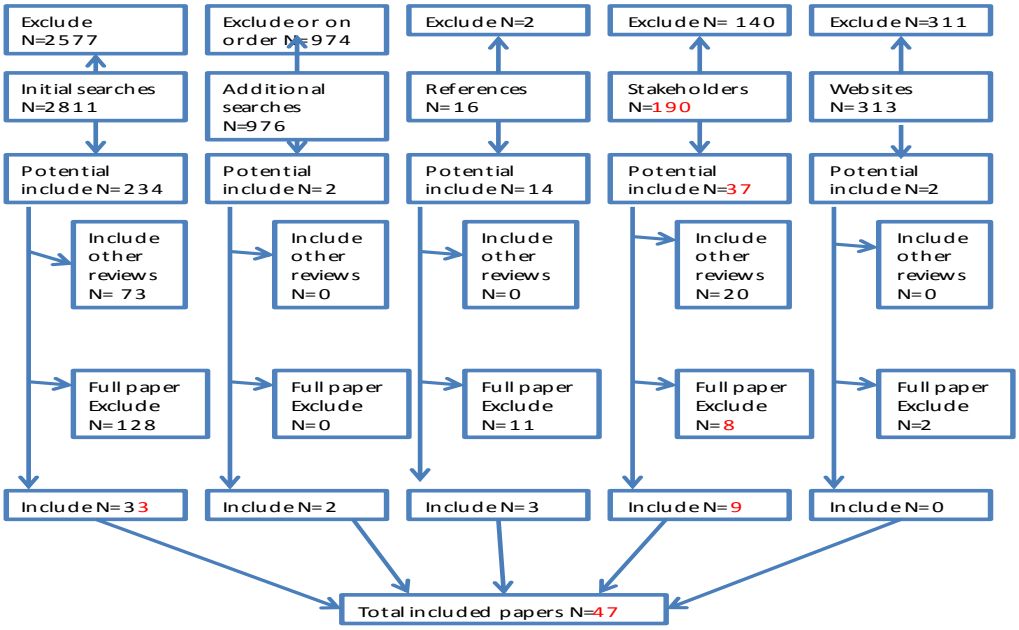
### 6.1. Quantity of the evidence available

In total 47 papers describing 46 studies were selected for inclusion in the review. 33 papers were identified through the initial database searches, 9 were supplied by stakeholders, 2 were identified through additional searches, and 3 were identified through scrutinising reference lists. A list of included studies is given in Appendix 3.

We excluded 41 papers which were obtained as full papers but subsequently found to be outside of the scope of the review. A list of these papers and the reasons for their exclusion is given in Appendix 4.

A Quorum diagram of the studies identified, their source and the number of studies excluded and included (including those identified as relevant to others reviews in this programme of work) is presented in Figure 1.

**Figure 1. Quorum diagram**




## 6.2 Study designs

34 studies reported in 35 papers used qualitative methods, mainly focus groups (n = 17), semi-structured interviews (n = 17), papers used qualitative methods, mainly focus groups (n = 16), semi-structured interviews (n = 16), participant observation (n = 2), diaries (n = 1) and action research (n = 1) or a combination. One study presented qualitative findings from an RCT. One focus group study used the 'photo-voice' method to encourage discussion. In the context of this review, this involved participants taking photographs of salient areas in their neighbourhood that they regard as positive or negative in terms of impacting on mobility.

A further 12 included studies used a cross-sectional design to obtain views and information about barriers and facilitators to walking and cycling.

### 6.3 Quality of the evidence available

Details of the study quality assessments are shown in Appendix 2.
The main limitation of study quality was lack of transparent reporting of data collection or data analysis methods. This could be due to constraints relating to word count limitations. In addition, there was often scant detail given about the population being assessed.

However, the studies included were generally of good quality with 10 scored as [++] and 35 scored as [+] (1 study was rated [-]). It is important to note that the quality grading instrument is subjective overall, and poor reporting in some cases made study grading challenging as it can be difficult to distinguish between poor study design and poor reporting.

### 6.4 Populations and settings

Of the 46 included studies (reported in 47 papers), 25 were based in the UK, 11 in the US, seven in Australia and three in Canada.

Four studies were concerned with the views of providers and researchers involved in organised walking programmes, with two of these studies also eliciting participant views. One study assessed the views of providers about successful workplace initiatives.

Twelve studies were concerned with the views of the users, or potential users of interventions (ten walking and three cycling interventions). One study elicited views of university employees about a workplace intervention. Four studies included female-only populations, two of which studies focused on African American women.

Thirteen studies assessed barriers and facilitators to walking for travel or leisure (2 with young people, 3 with adults, 6 with older adults and 2 with disadvantaged mothers). Ten studies explored factors that influence active travel to school, four of which included parental views. Four studies assessed

the shared use of walking and cycle trails, and five studies explored cycling for adult transport, one of which included the views of other road users.

### Table 2. Characteristics and main themes of included studies

| Author, date Quality | Country | Data collection and analysis methods | Population | Focus of paper | Findings |
|---|---|---|---|---|---|
| Ahlport 2008 [++] | US | Focus Groups<br><br>Social ecological and political economy of health. | Children and parents | Active travel to school | Barriers and facilitators according to children and their parents. Main concerns: safety, time, adequate support within environment and at school. |
| Beck 2008 [+] | US | Survey | Children and parents | Reasons for not walking to school | Distance was the most common barrier, followed by traffic danger. |
| Black 2001[+] | UK | Survey | Children | How to change mode of transport | Modifying attitudes to car-centredness a more useful policy than promoting general environmental awareness. |
| Bostock 2001 [+] | UK | Interviews<br><br>Exploring convergent and divergent themes. | Women; Disadvantaged Mothers | Walking; experiences of enforced walking. | Mothers report constraints of having no car, having to walk with young children. |
| Burroughs 2006 [++] | US | Focus Groups<br><br>Product, Price, Place, Promotion | Community | Walking trail intervention. Factors to promote development. | Elicitation of what might make a successful walking intervention. |
| Cairns 2010 [+] | UK | Case studies | Workplaces | Workplace travel planning | Employers need a strategy to improve alternative modes to driving. |
| Cavill 2007 [++] | UK | Focus Groups<br><br>Thematic analysis | Community | Cycling programme; Views of Loop line | Fears of cycle theft, attack and ridicule. Barriers differed according to age. Image important to young people, safety crucial to older people. Mothers needed to be able to include children in led rides. |
| Cerin 2010 [+] | Australia | Survey | Adults | Barriers to leisure time activity | Lack of motivation, lack of social support, time constraints as negatively related to weekly walking for recreation. Non-participation was predicted more highly by poor health, lack of motivation and lack of facilities than lack of skills or knowledge. |
| Cleary 2000[+] | UK | Evaluation survey | Participants in Nottingham Cycle Friendly Employers project | Factors that encouraged or hindered cycling to work. | The main influences were provision of workplace cycling facilities, a house or job move that made cycling more attractive, and heightened awareness of the importance of physical activity for health. Welcomed and best used measures were secure cycle parking, showering and changing facilities, and cycle purchase loans. |
| Copleton 2009 [+] | US | Participant observation | Walking group members >50 | Walking intervention: | Pedometer use encouraged a culture of competition that was not |

| | | | | | |
|---|---|---|---|---|---|
| | | Interviews<br><br>Analysis: NR | years of age | Reasons for the rejection of pedometers. | congruent with the moral economy of the group. |
| Darker 2007 [++] | UK | Interviews<br><br>Interpretative Phenomenological Analysis (IPA). | Community age 25-35 | Walking experiences | Different functions of walking and how these affect enjoyment and ultimately, walking behaviour. |
| Davis 2001 / 1996 [+] | UK | Focus groups<br><br>Analysis: NR | Children | Active travel advantages / disadvantages | Dangers of being outdoors: traffic, older children, etc. Differences between age groups. |
| Duncan 1995 [++] | US | Interviews<br>Observation<br><br>Grounded Theory; Interactionist theory. | Older adults | Walking in malls by elderly people. | Importance of physical and social activity post-retirement. |
| Dunn 2008 [+] | US | Focus groups<br><br>Coding at two levels. | Women; African American | Walking intervention: advantages and disadvantages | Motivation of having others involved, and integrating walking into everyday life. |
| Dunton 2006 [+] | US | Survey | Undergraduates | Barriers to walking. | Main barriers were lack of time, having a lot to carry, and wearing shoes that were uncomfortable. |
| Garrard 2008 [+] | Australia | Survey | Female cyclists | Cycling behaviour | Women showed a preference toward off-road paths compared to roads with no facilities, and off-road paths compared to on-road lanes. |
| Gatersleben 2007 [+] | UK | Survey<br>Diaries<br>Interviews<br><br>Transactional model | University staff and students | Readiness for cycling | Most people have not contemplated cycling and some cycle already. There is a group that would like to and could be persuaded. |
| Gilson 2008 [+] | UK | RCT<br>Interviews<br><br>Coding | Employees | Walking (workplace) intervention | Walking at work can increase feelings of well being but culture shift needed to integrate into current routines, especially for junior grades and desk workers. |
| Granville 2001 [+] | UK | Focus groups and interviews<br><br>Analysis: NR | Drivers and cyclists | Attitudes of drivers and cyclists toward each other in an urban context. | Drivers have negative image of cyclists due to displays of poor cycling behaviour. Cyclists need to negotiate space and hierarchy on the road. |
| Granville 2002 [+] | UK | Focus groups<br><br>Analysis: NR | Schoolchildren and parents | Why parents drive children to school | Benefits of walking acknowledged but there are disadvantages in terms of time and convenience especially when other children need to be dropped off at school. Cycling is not popular in this group. |
| Halden 2003 [+] | UK | Discussion Groups<br>Interviews<br>Case studies | Schoolchildren and parents | Children's attitudes to sustainable transport | Key issues for young people are punctuality, practicality, social, and safety. Parents had greater fears of 'stranger danger'. |
| Hynds 2009 [+] | UK | Focus Groups | Participants in walking groups | Motivation to participate in organised walking activities. | Participants tend to be retired. Groups are valued for routine, structure, and a key factor is social contact. Negative issues include the formation of cliques and repetitive walking routes. |
| Kirby 2008 [++] | UK | Focus Groups<br><br>Content analysis | Children | Active travel to school | Barriers such as time, distance, traffic, safety. Facilitators such as health, social. Suggestions for school initiatives such as walking / |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | cycling groups, incentives and rewards. |
| Lockett 2005 [++] | Canada | Focus groups using Photovoice<br><br>Analysis: NR | Older adults | Walking in neighbourhood | Barriers specific to infirmity such as insufficient time to cross roads, cracked pavements etc. |
| Lu 2011 [++] | US | Focus groups<br><br>Constant comparative method | Residents of 6 Assisted living Facilities > 60 years of age | Corridor walking behaviour: barriers and facilitators. | Corridor walking was regarded as safe compared with outdoor walking. Barriers included distances between rooms, lack of handrails. |
| Mackett 2001 [+] | UK | Survey | Adults | Barriers to walking. | Obstructions to mobility included crossings without dropped kerbs, narrow footpaths, and a dropped curb with a steep angle. The authors report that 19% of people aged >80 years could not reach key places if they need to pass through a gap of 1000mm. |
| Matthews (unpublished paper) [+] | UK | Interviews<br><br>Analytic induction | Providers: Managers and project co-ordinators | Walking intervention recruitment | Recruitment strategies |
| McKenna 2007 [++] | UK | Interviews<br><br>Hermeneutic Phenomenology: Dimensions of Time; Space; Body; Human Relations | Cyclists Commuter | Cycling to work | Barriers: weather, road users and traffic, obstacles, poor surfaces, fear of being knocked off bike. |
| Milton 2011 [+] | UK | Interviews<br>Focus groups<br><br>Inductive and Deductive | Walking programme staff<br>Walking group participants | Barriers and facilitators to implementing and participating in a family-based walking intervention. | Barriers to implementation included lack of time to prepare and market the programme.<br><br>Participation motivated by social aspect, activity for the children and being outdoors, rather than health aspect. |
| Newton (unpublished paper) [-] | UK | Interviews<br><br>Analysis: NR | Older adults | Walking in local environment. Design features and reasons for these. | Issues for elderly people when mobilising around their neighbourhood. |
| Nguyen 2005 [+] | Canada | Interviews and telephone survey<br><br>Sustainability theory.<br>Thematic analysis.<br>Telephone interview data Content Analysis. | Providers (directors of walking clubs) and Participants of walking clubs. | Walking clubs: Factors that lead directors to become involved and maintain involvement over time. | Advantages and challenges to directing a walking club.<br>Reasons that participants continue or discontinue membership. |
| Nies 2006 [+] | US | RCT results<br><br>Pender' Health Promotion Model.<br>Deductive analysis. | Women participants in walking programme | Walking intervention: Maintenance | Walking needs to be integrated into daily life and requires positive thinking and problem solving to overcome barriers. |
| Pooley 2011 [++] | UK | Case study evaluation<br>Survey<br>Go-Alongs<br>Interviews | Selected respondents from household survey | Decision-making in walking and cycling | Decisions about travel mode are based on complex family and work commitments that constrain choice for the individual. These need to be better understood when planning policy. |

| | | | | | |
|---|---|---|---|---|---|
| Ravenscroft 2002 [+] | UK | Focus Groups<br><br>Analysis: NR | Community users / non-users of shared routes | Walking / cycling routes | Focus on fear aspect of use / non-use |
| Ravenscroft 2004 [+] | UK | Focus Groups<br><br>Gidden's Ontological Insecurity; Beck's Risk Society. | Community wishing to use non-motorised cycle and walking routes | Walking / cycling routes | Discourses of constraint such as 'inconsiderate' cyclists, threat to safety, busy Sundays. Comparisons between site past and present, or with other areas such as parks. |
| Ripat 2010 [+] | Canada | Focus groups<br><br>Acceptability of the walkability project | Community | Walking in winter | Elderly people face barriers walking on unsafe pavements. Also shows benefits of engaging citizens in policy decision making. |
| Siderellis 2010 [+] | US | Survey | Mountain bikers | Biking trail use | Trail users preferred sites with higher quality trail conditions and more challenging routes. |
| Shaw 2011 [+] | UK | Focus groups Interviews<br><br>Thematic analysis | Researchers and participants in pedometer study (Walking for Wellbeing in the West) | Walking intervention: Behaviour related to Pedometer use | Barriers and facilitators to co-ordinating and running the intervention.<br><br>Reasons for participating or not. |
| Soh 2006 [+] | Australia | Survey | Anaesthetists | To asses exercise patterns. | Main motivators were maintenance of physical health and weight control. Main barriers included fatigue, being too busy, family commitments and lack of interest. Females were more likely to cite medical reasons whilst male were more likely to report being too busy. Younger people were more likely to cite family commitments and fatigue as a barrier. |
| Steinbach 2011 [+] | UK | Interviews<br><br>Constant comparative method | Cyclists Commuter | Cycling experiences in London | Cyclists as visible 'other' in towns where cycle use is low. Gender differences in image. |
| Stevenson 1992 [+] | Australia | Action research<br><br>Analysis: NR | Children | Cycling helmet use | Helmet use low: barriers are lack of style, poor fit, discomfort. |
| Wen 2010 [+] | Australia | Survey | Employees | Potential of workplace to promote active travel | Having convenient public transport encouraged active travel, whilst having a car park near to work encouraged driving. |
| Yeung 2008 [+] | Australia | Survey | Children | Factors that affect travel decisions | Children that used active transport tended to have shorter distances to travel. |
| Ziviani 2004 [+] | Australia | Survey | Children and parents | Factors that affect travel decisions | Influences on commuting behaviour included parental perceptions of physical activity; whether parents worked; concern about children walking without company; concern about the child's safety and concern about attending out of school commitments, such as music lessons, sport. |
| Zoellner 2009 [+] | US | Focus groups Diaries Systematic content analysis | Community: African American | Walking intervention: Use of pedometers | Pedometers and diaries regarded as motivating, though could forget to wear pedometer or complete diary. |

## 7. NARRATIVE SYNTHESIS

### 7.1 Question 1: What factors help or hinder the planning and delivery of walking and cycling-related interventions for recreation or travel purposes?

#### 7.1.1 Providers' and researchers' views about delivering interventions to increase walking

Four studies assessed the views of people that provide and assess outcomes of interventions; all these interventions were based on walking. Three were set in the UK and one in the US; one of the UK interventions was pedometer based and the US intervention targeted sedentary adults. Interviewees included walking club organisers who were responsible for developing walking routes and recruiting members and volunteers. One study interviewed researchers who were responsible for monitoring outcomes and gathering outcome data.

Organisational support was reported as a facilitator in the US based study (Nguyen *et al* 2005). In this pilot, support was provided by the Public Health Directorate and the municipal leisure office. Such support included provision of promotional material, development of recruitment campaigns and recruitment of new club organisers. They also offered advice and social / administrative support as well as organising events. However, the directors did not feel supported by community organisations. For example, it was often hard to obtain permission from local organisations to publicise the club so that recruitment campaigns became difficult to implement. Better links with business organisations was reported as a possible way of securing support through sponsorship.

For one UK intervention (Milton *et al* 2011), collaboration between two organisations (Ramblers and Action for Children) facilitated the implementation of family-based walking groups. Expertise in organising walking groups was thus combined with experience in catering for families.

However, in one US study, inter- club collaboration was lacking (Nguyen *et al* 2005), as directors were busy attending to the needs of their own club. This resulted in feelings of isolation for club directors, as well as missed opportunities to combine events with other clubs. Working alone often meant that too few members attended to carry out an event. In addition, collaboration could extend the repertoire of walking sessions to include routes used by other clubs.

Data from the UK study (Milton *et al* 2011) suggest that collaboration takes time to establish, and is facilitated by introductions between organisers and clarity about goals. For example, rolling out the family-based programme to established groups became easier (following initial animosity) once it was made clear that they would run alongside other initiatives rather than replace them. There were suggestions that the four week run in time had not allowed for sufficient planning. The recruitment of one Project Officer to co-ordinate between the two organisations and communicate with admin staff facilitated working relationships as well as knowledge about progress.

Responsibility for recruitment was a focus in one UK study that reported the recruitment process as draining on time and resources (Matthews [no date]). The available budget often limited options available. Some volunteers reported a lack of competence in recruitment. Competence was reported to be evident in volunteers with marketing skills, and those without such skills felt that training would improve their knowledge and skills. Particular issues that were deemed important were having a conceptual framework for recruitment and understanding the target audience. Word of mouth was reported to be the best recruitment method in three included studies (Matthews [no date]; Nguyen *et al* 2005; Milton *et al* 2011).

Recruiting volunteers from the non-walking organisation was initially difficult in one study (Milton *et al* 2011). The social aspect of leading walking groups was the main motivator for those that did engage with the intervention. It was suggested that volunteer leaders would best be involved from the planning stage of the intervention.

Responsibility for participants was a burden for those involved in delivering interventions. In one UK pedometer study (Shaw *et al* 2011), researchers reported concern about the workload involved in carrying out measurements for evaluation, such as BMI and cholesterol levels. In the US pilot study, directors felt a sense of responsibility for the safety of the various sub-groups present among members. Directors had to be present on all walks and were responsible for testing walks out prior to use. They reported a sense of disappointment at not receiving more support from regular club members. There was also a reported sense of responsibility for motivating and retaining members that had been recruited. A high turnover of members was reported due to the low cost of dropping out. There was also a reported lack of available tools for motivation, and incentives such as gifts were used to maintain interest. (Nguyen *et al* 2005).

Interaction with members was a common theme across all three studies. Attendance was reported to be enhanced by a positive rapport between providers and members, which was in turn facilitated by the continuity of service of volunteers. In order to maintain communication with members, one pilot intervention developed an attendance sheet that was completed at the beginning of sessions. The process of completing the sheet encouraged members to speak with directors, whereas without this interaction, communication was limited (Nguyen *et al* 2005). Interaction between members provided a social aspect to participation that was emphasised when motivating people to take part.

Personal satisfaction was a facilitator in maintaining the role of provider. Training and carrying out responsibilities within the intervention developed the competencies of the director (Nguyen *et al* 2005). Directors also benefitted from the health and social gains that were common to members, although one de-motivator was the requirement to walk at a slower pace than normal in order to stay with the group.

**ES1. Providers' and researchers' views of barriers and facilitators to planning and delivering interventions to increase walking.**

**Moderate evidence from four studies suggests that facilitators to planning and delivering interventions included organisational support and sufficient planning time. It may be beneficial to include volunteer leaders at the planning stage.**

**Having previous experience in marketing and a conceptual framework facilitated recruitment efforts. Personal satisfaction, social interaction and a positive rapport with group members were motivational effects of leading walking groups.**

**Barriers to planning and delivery included lack of inter-organisational collaboration. This was facilitated by introducing staff in different organisations to each other and being clear about shared goals. Employing an individual to co-ordinate between organisations was a facilitator to implementation.**

**De-motivators to being involved in organising and monitoring groups included researchers' perceived workload, efforts required for effective recruitment, lack of support from and feelings of responsibility for group members.**

**Milton *et al* (2011 Evaluation UK +)** suggested that sufficient planning time is required for successful implementation of a family-based intervention. Involvement of proposed walking leads at the planning stage was suggested as a way of increasing their engagement with the programme.

**Nguyen *et al* (2005 pilot evaluation + US)** reported that walking group policy makers supported the walking group by promoting the intervention and assisting with recruitment. Administrative support was also supplied, and events were organised.

**Matthews *et al* (no date; interviews + UK)** reported that the process of recruiting members to a walking group was draining on time and resources for the organisers, and some volunteers lacked skills in recruitment. Having experience in marketing and a conceptual framework around recruitment was a facilitator to recruiting new members. However, word of mouth was regarded as the most effective recruitment strategy.

**Nguyen *et al* (2005 pilot evaluation + US)** reported that running the walking group provided a sense of personal satisfaction for organisers as well as an opportunity for personal development and health promotion. Interaction with club members was a motivator for organisers.

Collaboration with other organisations was an issue in two studies (**Nguyen *et al* (2005 pilot evaluation + US; Milton *et al* 2011 Evaluation UK +),** due to a focus on their own organisation and lack of communication. In one study (**Nguyen *et al* 2005 pilot evaluation + US)** this meant that walking routes

were not shared and events were less well attended. Club directors could also feel isolated. In the other study (**Milton *et al* 2011 Evaluation UK +),** collaboration between a walking association and a family support group was improved through members getting to know each other and being clear that goals were to be shared, and that interventions would run alongside each other rather than new initiatives replacing existing ones. Co-ordination by one designated officer also facilitated implementation.

**Nguyen *et al* 2005 pilot evaluation + US** reported that group organisers expressed views about their burden of responsibility for the well-being and safety of members, especially if leadership was not shared. Recruitment and maintenance of membership numbers were regarded as a burden, and strategies were developed by the club to limit drop out. Having to walk at a slow pace with other members was a de-motivator.

**Shaw *et al* (2011 interviews + UK)** found that carrying out routine physiological measurements in a pedometer study was regarded as a burden for researchers.

***Applicability:*** *Findings from these studies have partial applicable to other walking groups. The organisation of walking interventions will differ across countries, regions and groups. Groups may have different goals, and recruit specific populations. There is no reason to believe that the barriers and facilitators described are not applicable to other similar interventions.*

### 7.1.2 Participants' views about interventions to increase walking

Ten studies assessed participant views about walking interventions, six were based in the US (Nguyen *et al* 2005; Nies & Motyka 2006; Dunn 2008; Zoellner *et al* 2009; Burroughs *et al* 2006; Copleton 2009), and four in the UK (Shaw *et al* 2011, Gilson *et al* 2008; Hynds & Allibone 2009; Milton *et al* 2011).

In the US, one walking intervention targeted sedentary adults in a suburban area with the aim of encouraging walking (Nguyen *et al* 2005). One RCT used telephone counselling to encourage African American women to walk more (Nies & Motyka 2006). One study assessed the acceptability of prescribed walking for African American women (Dunn 2008).

In the UK, one study assessed the views of participants in the Walking for Health intervention (Hynds & Allibone 2009), and another assessed views about participating in a family-based intervention that combined efforts of

‘Rambers’ and ‘Action for Children’ to create ‘Furness families Walk4Life’ (Milton *et al* 2011).

Three studies focused on pedometer based interventions. Two assessed the feasibility of a pedometer based walking intervention, one in the UK (Shaw *et al* 2011) and one in the US targeting African American women (Zoellner *et al* 2009). A third study explored why older adults targeted in a pedometer intervention rejected the use of pedometers (Copleton 2009).

One study assessed a workplace based intervention that included walking outside at break times, as well as increased walking within the office building, for example, to deliver messages rather than using e-mail (Gilson *et al* 2008). Another study explored preferences of females aged 35-54 years about a proposed walking intervention (Burroughs *et al* 2006).

*Motivation to participate*

Attending a walking club was reported to motivate people to walk through having access to a walking role model (Nguyen *et al* 2005; Burroughs *et al* 2006) and access to organised walking routes (Nguyen *et al* 2005). The support and security of being part of a group were motivators for women (Burroughs *et al* 2006). In a family-based intervention, parents were motivated by the opportunity for their children to participate in activities outside nursery hours and to spend time as a family. An extra bonus was that walking is free of cost (Milton *et al* 2011). Hynds & Allibone (2009) reported that the opportunity to fill the day with structure and routine was important for people without employment.

In addition, the incentive to improve health, get fresh air and enjoy the natural environment was reported (Hynds & Allibone 2009).

*Barriers to participation*

In one work-based intervention, walking was limited by time constraints and a busy schedule. For some employees, particularly administrative staff, the working culture was not receptive to individuals walking around the building instead of sending e-mails (Gilson *et al* 2008). In a family-based intervention, schedules were not always suitable for children attending school. In low-attended groups, there was limited scope for social interaction (Milton *et al* 2011)

**ES2 Participants' views about motivators and barriers to participating in interventions to increase walking**

**Moderate evidence from five studies suggests that participating in a walking intervention motivated people to walk through the presence of role models, organised routes, and the support of being part of a group.**

**Families were motivated by the opportunity for children to participate in an activity that was free of charge. For others, the opportunity to improve health and enjoy fresh air and nature were motivational.**

**Barriers to motivation include conflicts between walking activities and work / school schedules, and cultural lack of acceptance in regard to work-based activity.**

**Nguyen *et al* (2005 pilot evaluation + US)** reported that having access to a role model and to organised walk routes were motivators to attendance. For women, having the support and security of a group was a motivator **(Burroughs *et al* 2006 focus groups ++ US).** For families, the opportunity for children to participate in activities with the family, free of charge, and outside of nursery hours were incentives **(Milton *et al* 2011 Evaluation UK +).** For adults, a sense of routine and structure was valued for those who were not in employment **(Hynds & Allibone 2009 focus groups + UK).**

Participants in one study were motivated by the opportunity to improve their health and be out in the fresh air and natural environment **(Hynds & Allibone 2009 focus groups + UK).**

However, barriers to participation included conflicting schedules with school attendance (**Milton *et al* 2011 Evaluation UK +)** or workplace responsibilities **(Gilson *et al* (2008 interviews + UK).** In a workplace setting, **Gilson *et al* (2008 interviews + UK)** also reported that increasing walking time required acceptance from colleagues, and this varied depending on the status of the employee within the organisation.

***Applicability:*** *The findings from these studies are applicable to other walking groups. The acceptability of walking interventions will depend upon specific walking group characteristics, settings and aims. There is no reason to believe that the barriers and facilitators reported are not applicable to interventions implemented in the UK.*

*Factors associated with maintaining participation*

*Social interaction*

The social aspect of a walking club was a major factor in walking group participation (Hynds & Allibone 2009; Shaw *et al* 2011; Nies *et al* 2006; Milton *et al* 2011). There was a strong bond and sense of loyalty for those participating in Walking for Health; so much so that attendance was influenced by the commitment to the group. Group members enjoyed sharing knowledge and learning from each other about cooking, plants and the history and geography of the area. Group events were valued particularly by those that were socially isolated (Hynds & Allibone 2009).

A US based intervention targeting African American women was viewed positively because women could walk together and they could encourage other people to walk (Dunn *et al* 2008). For the women in one feasibility study, spending time with family and friends was a motivator for continued participation, though men in the same study preferred to walk alone and at their own pace (Burroughs *et al* 2006). Time with family was also reported as important in one family-based intervention (Milton *et al* 2011).

Positive rapport between the club directors and club members also encouraged participation (Shaw *et al* 2011).

However, if friends dropped out, or if participants preferred to walk with people other than members of the walking group, this motivator was lost (Nguyen *et al* 2005). In addition, new members could be put off by the formation of cliques and a perceived lack of welcoming (Hynds & Allibone 2009). Whilst

the social aspect was important for families during the initial four weeks of led walks, participants tended to walk with their own families during the independent walking stage, suggesting that there had been insufficient time for relationships between families to develop (Milton *et al* 2011).

*Social support*

As well as having people to walk with, it was important to feel supported by significant others, such as partners or friends, in walking (Nies & Motyka 2006). A work-based walking intervention carried out in the UK was reported to improve communication between colleagues, and create a greater sense of community among employees (Gilson *et al* 2008).

For one sample of women, feedback by e-mail was a suggested motivator rather than receiving regular phone calls, which were seen as intrusive (Burroughs *et al* 2006).

*Integration of activity into daily life*

In general, walking as an activity was regarded as relatively easy to integrate into daily life (Nies & Motyka 2006; Dunn 2008; Shaw *et al* 2011) as it can be carried out in most settings, and can be made a priority. In one study, the ability to turn up without booking was a positive influence. Routine and structure was valued for those who were not in employment (Hynds & Allibone 2009).

Some African American women reported that not only was walking a part of daily life, it had a positive effect on other daily routines. The healthy aspect of walking had influenced cooking practices, and through having time away from the home, interactions with the family had become more positive (Dunn 2008).

However, for some people, especially women, the lack of ability to integrate activities into their daily life was more difficult. Participating in organised walks was a problem if schedules coincided with other commitments or if life

changes occurred (Nguyen *et al* 2005; Nies & Motyka 2006; Dunn 2008; Hynds & Allibone 2009; Milton *et al* 2011).

In one pedometer-based intervention, it was reported to be difficult for some to incorporate the extra walking into daily activities because of practical issues such as wearing heels for work, or not wanting newly-styled hair to get wet (Shaw *et al* 2011).

For African American women, learning to focus on the self sufficiently to make time to walk was a barrier (Dunn 2008).

*Monitoring activity*

In two studies (Shaw *et al* 2011; Zoellner *et al* 2009), pedometer use motivated participants to walk more through the process of self- monitoring. When self-monitoring ended at the close of the intervention duration, motivation decreased. Participants in one study reported that counting steps at the end of a walk gave a sense of achievement (Hynds & Allibone 2009). In one study (Shaw *et al* 2011), receiving feedback from regular physiological measurements was also reported to be a motivator, despite the reticence of researchers about this process.

However, Copleton (2009) reported that pedometers were rejected as contradicting the moral economy (this term was not defined by the author but is used to describe shared values about social relations) of the walking group, which was based around social interaction. Pedometer use was viewed by the older, mainly female adults in the group as competitive and divisive. In another study, participants reported forgetting to use their pedometer or complete log-books (Zoellner *et al* 2009).

*Other motivators*

Members generally valued variation in walking routes, as well as being able to view the scenery, though individual preferences need to be taken into account

as some walkers are happy to use familiar routes (Hynds & Allibone 2009). Incentives such as free gifts were suggested as a potential motivator in one study (Burroughs *et al* 2006).

*Reasons for discontinuation*

Reported reasons for dropping out of walking interventions included boredom (Shaw *et al* 2011), the walking pace, dissatisfaction with the atmosphere of the club, and lack of congruity between the club aims and the needs of participants (Nguyen *et al* 2005). In one intervention targeting African American women, drop out was often due to a lack of objectives, and having no support to continue (Dunn 2008).

**ES3 Participants' views about maintaining participation in interventions to increase walking**

**Moderate evidence from ten studies provided evidence regarding factors associated with maintenance of participation.**

**Social interaction and social support were major factors in maintaining participation. Maintenance was also related to the extent to which activities could be integrated into daily life.**

**Monitoring activity, providing people remembered to self-monitor, could increase motivation, though it could also introduce unwanted competition between members.**

**Other motivators included variation in walking routes, and incentives such as gifts.**

**Barriers to maintenance included the difficulty of integrating walking and attendance at clubs into daily routines. Boredom, dissatisfaction with elements of the club, and incongruent aims were reported factors associated with discontinued membership.**

The social factor associated with walking in groups was supported by **Shaw *et al* (2011 interviews + UK)**, **Nies & Motyka (2006 RCT+ US)**, **Milton *et al* (2011; Evaluation UK +), Dunn (2008 focus groups + US), Hynds & Allibone (2009 focus groups + UK)** and **Copleton (2009 observation and interviews + US).** The social factor was particularly strong for women and older adults. **Hynds & Allibone (2009 focus groups + UK)** reported a strong bond and sense of loyalty to the group that facilitated attendance. For men, the social factor was not so important with males tending to prefer walking alone **(Burroughs et al 2006 focus groups ++ US).**

Support was also important; in one intervention (**Burroughs *et al* 2006 focus groups ++ US),** feedback from providers was welcome, though e-mail was the preferred mode.

**Nies & Motyka (2006 RCT+ US)** highlighted the importance of family and friends in supporting the maintenance of walking behaviours. Walking also had a positive effect on interactions with family members.

**Gilson *et al* (2008 interviews + UK)** reported that walking to deliver messages at work instead of e-mailing created a greater sense of community.

An important aspect of walking was the ability to integrate walking interventions into daily life. The ability to turn up without booking was a positive factor for some, and a sense of routine and structure was valued for those who were not in employment **(Hynds & Allibone 2009 focus groups + UK).**

However, **Shaw *et al* (2011 interviews + UK)** reported that women in particular found difficulty integrating extra walking into daily routines. Life changes, coinciding schedules and other commitments were also a barrier (**Nguyen *et al* 2005 pilot evaluation + US; Nies & Motyka 2006 RCT+ US; Dunn 2008 focus groups + US; Hynds & Allibone 2009 focus groups + UK).** Wearing female-oriented clothing such as high heels was a barrier to walking whilst at work **(Gilson *et al* 2008 interviews + UK)**. **Nguyen (2005 pilot evaluation + US); Nies & Motyka (2006 RCT+ US)**, For African American women, it was difficult to focus on self-based activities **(Dunn 2008 focus groups + US).**

Monitoring activities was reported as a motivator. **Shaw *et al* (2011 interviews + UK)** and **Zoellner *et al* (2009 focus groups and diaries + US)** reported that pedometer use and the process of self-monitoring increased walking behaviours. Hynds & Allibone (2009 focus groups + UK) reported that step counting gave a sense of achievement.

However, **Copleton (2009 observation and interviews + US)** found that in older adults (mainly female), pedometer use and fitness objectives conflicted with the moral economy (shared values regarding social interaction) of the walking group, which was based on sociability rather than competition. In addition, people often forget to complete logs, or to use their pedometer **(Zoellner *et al* 2009 focus groups and diaries + US).**

Other incentives included rewards and gifts (**Burroughs *et al* 2006 focus groups ++ US)**.

**Nguyen *et al* (2005 pilot evaluation + US)** reported that the atmosphere of the club, mismatch between aims of the club and aims of the participant, as well as the pace required to walk could be barriers to participation in walking interventions. **Shaw *et al* (2011 interviews + UK)** also added that boredom

could dissuade attendance, and for African American women, **Dunn (2008 focus groups + US)** reported lack of objectives as potential barriers.

***Applicability:*** *The findings from these studies are applicable to other walking groups. The motivation to maintain walking behaviour within an intervention will depend upon individual circumstances and requirements as well as the characteristics and aims of the club. There is no reason to believe that the barriers and facilitators reported are not applicable in the UK.*

*Perceived benefits from participation in walking interventions*

Whilst attending walking interventions required motivation and encouragement, a lengthy list of perceived benefits were reported in eight studies as a result of walking. Perceived benefits are facilitators to motivation and therefore facilitators to continuing participation (Dunn 2008; Ahlport *et al* 2008).

Physical benefits were reported in five studies (Nguyen *et al* 2005; Gilson; Dunn 2008; Nies & Motyka 2006; Burroughs *et al* 2006). These include increased fitness, awareness of one's own health, feeling energised, increased stamina, weight loss, and improved body shape.

Psychological benefits were reported in three studies (Gilson *et al* 2008; Dunn 2008; Nies & Motyka 2006; Burroughs *et al* 2006), and include enhanced mood, stress reduction, mental and emotional satisfaction, and feeling relaxed. Feeling tired at the end of a walk was associated with a sense of achievement (Hynds & Allibone 2009).

Three studies (Gilson *et al* 2008; Nguyen *et al* 2005; Nies & Motyka 2006) reported that walking encourages one to get out of the house or office, adds variety to the working day, keeps one busy and active, and is an opportunity to spend time with the family. One work based study reported that the walking intervention gave employees a sense of autonomy, as well as the feeling that employers cared about them.

Participating in the intervention also promoted the resolution of interpersonal tensions (Gilson *et al* 2008). One telephone counselling intervention study reported that women participants enjoyed the peace, solitude and time to think that walking offered (Nies & Motyka 2006). For African American women, this was reported as meditative and spiritual (Dunn 2008). Walking was also reported to be fun (Nguyen *et al* 2005), and offered the opportunity for being out in the fresh air (Nies & Motyka 2006) and sightseeing (Shaw *et al* 2011), as well as having a social aspect (Copleton 2009).

**ES4 Participants' views of the benefits of participating in a walking intervention**

**Moderate evidence from eight studies highlighted the reported benefits of walking as part of a walking intervention.**

**Perceived benefits to walking were reported to facilitate motivation and hence walking behaviour (Dunn 2008 focus groups + US). Such benefits could be emphasised when encouraging participation in interventions.**

**Reported benefits included physical and psychological benefits, adding variety to the day and getting out of the house or office. Walking could provide a sense of peace and solitude, and was also fun, providing an opportunity to be out in fresh air and see the sights.**

Reported physical benefits were feeling healthy **(Dunn 2008 focus groups + US); Burroughs *et al* (2006 focus groups ++ US),** and fit **(Nguyen (2005 pilot evaluation + US); Nies & Motyka (2006 RCT+ US)**, increased energy **(Gilson *et al* 2008 interviews + UK; Nies & Motyka (2006 RCT+ US)**, lower blood pressure **(Nies & Motyka 2006 RCT+ US)**, weight loss **(Nies & Motyka 2006 RCT+ US; Dunn 2008 focus groups + US)** and improved body shape **(Dunn 2008 focus groups + US).**

Psychological benefits included enhanced mood **(Gilson *et al* 2008 interviews + UK; Nies & Motyka 2006 RCT+ US),** stress reduction **(Nies & Motyka 2006 RCT+ US); Dunn 2008 focus groups + US; Burroughs *et al* (2006 focus groups ++ US),** mental and emotional satisfaction **(Nies & Motyka 2006 RCT+ US)**, feeling rejuvenated **(Nies & Motyka 2006 RCT+ US)**, and having meditative or spiritual feelings **(Dunn 2008 focus groups + US).** Feeling tired at the end of a walk was associated with a sense of achievement **(Hynds & Allibone 2009 focus groups + UK).**

In a workplace intervention, walking was reported to add variety to the day and improved output at work **(Gilson *et al* 2008 interviews + UK)**. For a group of previously sedentary adults, walking became fun, and was a chance

to get out of the house **(Nguyen 2005 pilot evaluation + US).** Walking for one group of mid-age women allowed them time to think, time out of the office, time with the family and fresh air **(Nies & Motyka 2006 RCT+ US).**

Benefits reported from two pedometer based interventions included seeing the sights **(Shaw 2011 interviews + UK),** and socialising with members of the group **(Copleton 2009 observation & interviews + US).**

***Applicability:*** *The findings from these studies are applicable to other walking groups. Benefits of walking may differ by setting, though there is no reason to believe that the benefits reported are not applicable in those settings within the UK.*

*Perceived barriers to walking for participants in walking interventions*

However, as well as perceived benefits, perceived barriers to walking were also reported. These were mainly related to physical limitations, religious beliefs or in one study (Nguyen *et al* 2005), the financial costs of participation. Women in one study (Nies & Motyka 2006) reported injuries, illness and feeling depressed or tired as individual-level barriers to walking. Most of the women in this study were able to overcome these barriers and continue to walk, though for five of the sample this was not possible due to exacerbation of previous illness or injury. For two women, walking actually aggravated their knee and ankle injuries. Some women were taking medication for depression; these women reported more barriers than the other women and found it difficult to meet their goals. Health problems such as thyroid, arthritis and ligament damage were also a barrier for African American women in one study. For these women, promises made to God that they would continue to walk were reported to be unsuccessful because of the devil (Dunn 2008).

As well as individual level barriers, regular attendance at a walking intervention could be influenced by lack of access, bad weather or difficult terrain and safety concerns (Hynds & Allibone 2009). In some cases, the club or the walking route might be too far from home to travel (Nguyen *et al* 2005; Nies & Motyka 2006; Hynds & Allibone 2009), though for others the accessibility of the club was a positive aspect. In one study, women were concerned that a trail was not a safe environment for a programme because

of inadequate lighting, pet waste and litter (Burroughs *et al* 2006). In another study, older participants found difficulty negotiating stiles, particularly if they were poorly maintained (Hynds & Allibone 2009).

Weather conditions were a common restriction to participation (Shaw *et al* 2011; Nguyen *et al* 2005; Nies & Motyka 2006; Burroughs *et al* 2006; Hynds & Allibone 2009). Weather that is too hot and humid was cited as a limitation to potential trail participation (Burroughs *et al* 2006). In the UK, extreme conditions are rare, though mud, snow, ice and rain can dissuade attendance (Hynds & Allibone 2009) and hot weather may be an occasional barrier.

**ES5 Walking intervention participant's views of perceived barriers to walking.**

**Moderate evidence from seven studies highlighted perceived barriers to walking for participants of walking interventions. These included physical and psychological limitations, environmental barriers, and poor weather conditions.**

Physical barriers to continuing with the walking programme included health problems such as arthritis **(Dunn 2008 focus groups + US)),** and physical limitations such as illness and injuries **(Nies & Motyka 2006 RCT+ US)**. Tiredness and depression also prevented some women from continuing attendance **(Dunn 2008 focus groups + US).**

Poor weather conditions or hot weather were reported disincentives to walking **(Shaw 2011 interviews + UK; Nguyen *et al* 2005 pilot evaluation + US; Nies & Motyka 2006 RCT+ US; Dunn 2008 focus groups + US; Burroughs *et al* 2006 focus groups ++ US; Hynds & Allibone 2009 focus groups + UK).** One study reported costs of participation as a barrier **(Nguyen *et al* 2005 pilot evaluation + US).**

Lack of access to the walking route, and obstacles such as poorly maintained stiles along the walking route were also reported barriers **(Hynds & Allibone 2009 focus groups + UK)**

***Applicability:*** *The findings from these studies are applicable to other walking groups. The barriers to participation in walking interventions might depend upon individual circumstances, such as age and physical fitness as well as seasonal weather conditions. Weather conditions may be better, or more extreme, in the US, Canada and Australia than in the UK, though there is no reason to believe that the barriers reported are not applicable in the UK.*

Barriers were often overcome using a set of strategies, including making and scheduling time, problem solving and using internal or external motivators such as positive thinking and focusing on long-term benefits. Making walking a priority and fitting it into the day as often as possible allowed walking goals to become feasible (Nies & Motyka 2006). For African American women, weaving walking into their family life allowed them to shift focus onto the whole family, including themselves (Dunn 2008).

**ES6 Suggested strategies to overcoming barriers to maintaining walking in a walking intervention**

**Moderate evidence from two studies highlighted reported strategies to overcome perceived barriers to participating in walking interventions. These included making time, and integrating walking into daily life as well as thinking positively.**

**(Nies & Motyka 2006 RCT+ US)** reported strategies including scheduling time to walk, problem solving and using motivators such as positive thinking and focusing on the long-term benefits. Goals were more achievable if walking was made a priority and was integrated into daily life as much as possible. Similarly, **Dunn 2008 (focus groups + US)** reported that for African American women, weaving walking into family life was a strategy that allowed themselves and the family to participate.

***Applicability:*** *The findings from these studies are applicable to other walking groups. The ability to implement strategies to overcome barriers to participation in walking interventions will depend upon individual circumstances.*

### 7.1.3 Providers' views about effective intervention components that motivate walking and cycling

One paper assessed workplace interventions to increase walking and cycling across 20 sites (Cairns *et al* 2010). Interviews and surveys were carried out with UK based employers to identify successful components of the interventions.

The factors most associated with increased walking included the provision of quality off-site and on-site access. Successful schemes marketed walking to employees using improved health as a motivator. They also provided security, changing and drying facilities or lockers, organised health walks, and

promoted a positive attitude towards walking. Some provided financial incentives and / or complementary products such as maps and pedometers.

The factors most associated with increased cycling also included the provision of quality off-site access, showers, changing and drying facilities or lockers. Some provided financial incentives and / or complementary products such as cycle maps. They promoted a positive attitude towards cycling and groups for those owning a bicycle. Increased availability for parking, repair services and better security for storage were important. Other incentives included loans for, or discounts and promotions on cycling equipment.

**ES 7. Providers' views about effective intervention components that motivate walking and cycling**

**Moderate evidence from one study suggests that workplace efforts to encourage walking and cycling are most successful where they attend to cultural attitude, access, security and available facilities. Incentives and provision of equipment are also motivating.**

One study (Cairns et al 2010 survey and interviews + UK) provide evidence that, across 20 workplace initiatives, walking and cycling are increased where good on-site and offsite access is available, along with provision of showers, drying and changing facilities. Organised walks at lunchtime and cycling groups were an incentive.

Organisational attitude was important, with some workplaces marketing the benefits of walking to staff. Motivators such as complementary products or financial incentives were used.

For cycling, the ability to borrow equipment or receive discounts on cycling equipment was important, as was having secure parking for cycles.

***Applicability:*** *Findings from this study were taken from a range of workplace initiatives within the UK and so are applicable in UK workplace settings.*

### 7.1.4 Intervention provider views about cycling interventions

**ES8. Provider views reporting barriers and facilitators to planning and delivering interventions to increase cycling.**

**No evidence was found for provider views reporting barriers and facilitators to planning and delivering interventions to increase cycling.**

### 7.1.5 Intervention participant views about cycling interventions

One focus group study (Cavill & Watkins 2007) and one survey evaluation (Cleary *et al* 2000) assessed the views of a proposed cycling intervention and the impact of a city-wide initiative.

One study (Cavill & Watkins 2007) explored views about a proposed cycling intervention among six community groups living near the Loop Line in Liverpool. The groups consisted of young people (aged 11-15), single mothers (aged 25-35) and older people (aged over 50). Most had some experience of cycling, though for all but two it was not an important part of their lives.

Whilst the Loop Line was marketed as a safe and pleasant environment for cycling, local residents were less positive. They held fears about crime and youths in the area. One man suggested that it was not safe to be there alone as "*there's horrible people on the cycle paths*"

The concern was mainly about young people hanging out on the Line, particularly under the railway bridges, and especially at night. The impact of this was that most people had discarded ideas of cycling on the Loop Line, regarding it as a 'no-go area'.

Some people stated that they would use the line as they knew which areas to avoid. Some sections of the Line were pleasant to visit; a few participants already used the Line regularly, and were keen to point out that concerns related to particular places and to visiting after dark, whereas at weekends during the daytime it was well used by families. Suggestions for improvement included cutting back bushes and trees to increase visibility, as well as tightening security.

The acceptability of led cycle rides was discussed; young women were concerned that cycling was not cool or the right thing to do. However, if all their friends were also participating, this would be acceptable. For boys, a facilitator would be using the right bikes, and not having to wear helmets. For

older adults, protection from potential trouble was a facilitator. For young mothers, led rides facilitated use of the trail with protection of having others around.

Cleary *et al* (2000) evaluated the Nottingham Cycle Friendly Employers project across eight employers. The project increased overall cycling awareness and activity. 42% reported to have increased their level of commuting. The main influences on this increase were the provision of workplace cycling facilities, a house or job move that made cycling more attractive, and heightened awareness of the importance of physical activity for health. Welcomed and best used measures were secure cycle parking, showering and changing facilities, and cycle purchase loans.

**ES9. Participants' views about taking part in interventions to increase cycling**

**Moderate evidence from one exploratory study and one evaluation showed that facilitators to a led cycling intervention were a feeling of safety and acceptance that was obtained from cycling in a group.**

**Provision of acceptable equipment and the need not to wear a helmet was a facilitator for boys.**

**In a workplace based cycling intervention, facilitators included the provision of storage and changing facilities and raised awareness about benefits.**

One exploratory study **(Cavill & Watkins 2007 focus groups ++ UK)** elicited community members' views about use of a cycle trail and a proposed intervention that included led cycling groups.

The main facilitator to using the trail for led cycle groups was the protection of riding together in a group. For young women, the image of cycling as 'uncool' was an issue, but this barrier would be lessened if they were cycling with friends.

Image was also an issue for boys, whose participation would be facilitated by the provision of the 'right' bike, and not having to wear a cycling helmet.

**Cleary *et al* (2000 survey evaluation + UK)** found that the main influences on increase in cycling following an intervention were the provision of workplace cycling facilities, a house or job move that made cycling more attractive, and heightened awareness of the importance of physical activity for

health. Welcomed and best used measures were secure cycle parking, showering and changing facilities, and cycle purchase loans.

***Applicability:*** *The findings from these UK based studies are applicable to other potential cycling interventions. The motivation to participate in cycling interventions might depend upon individual circumstances, as well as local geography and usage of the proposed site. Some areas of the UK may be more or less attractive as cycling venues than the one described here. Workplaces will also differ in provision of facilities, and interventions may be affected by factors outside the control of organisers, such as weather conditions.*

## 7.2 Question 2: What factors help or prevent people from walking and cycling for recreation or travel?

### 7.2.1 Views about walking for travel or leisure (non-intervention)

Six studies explored views of the community regarding walking either as a mode of travel, or as a leisure pursuit. Responses differed by population as well as the aim of walking.

*Young adults*

In one study (Darker *et al* 2007) young adults reported having busy working lives, and walking was rarely reported to be performed for either leisure or transport. For young males, exercise was not the main motivation to walk as it was described as being too gentle and not providing enough cardiovascular benefit. Typically, a treadmill would be used for exercise, and cycling for either exercise or transport rather than walking. In contrast, one female participant could not see the point of carrying out more exercise on a treadmill if she had already walked (or cycled) to the gym.

For males and females, walking for leisure might be considered if there was a social aspect, such as showing friends and family the sights of the nearby countryside, or if there was a challenge involved, such as walking 100 miles with the Air Training Corps. In this way, walking held meaning as a form of interaction with others.

Walking as a mode of transport was often too time consuming for either males or females unless for short distances. With busy lives, walking was not perceived as efficient, and so for transport purposes time would not usually be given up in this way. Having to get up early to incorporate walking into the journey to work was not motivating. From the accounts, it appeared that there may an optimum duration, such as 30 minutes, that individuals regarded as an acceptable amount of time to spend walking from one place to another. This criteria contrasts starkly with the amount of time that some young people were prepared to spend on other forms of walking such as for leisure, in challenges or walking up Snowdon (3 hours). Walking in the city was not as enjoyable as walking in the countryside because of the associated noise, though the use of music was one way of distancing oneself from the noise and other negative distractions.

Those that did enjoy walking appreciated the slow pace and the opportunity to take a break and relax. Walking was a way of allowing reflection and for one participant was a form of 'therapy'. The authors suggest that walking can allow a sense of being out of the world, an inner calm.

Dunton *et al* (2006) surveyed barriers to walking in US undergraduates and found that lack of time, having a lot to carry, and wearing shoes that were uncomfortable were the most highly rated barriers.

**ES10. Young people's views about walking for travel or leisure (not related to an intervention)**

**Moderate evidence from one interview study and one survey study suggests that walking for leisure was facilitated by walking as a social event or as part of a challenge.**

**Barriers to walking for travel or leisure for young people are mainly related to lack of time. In addition, having a lot to carry and wearing shoes that were not comfortable were disincentives. Young people report busy lives as a barrier to walking for transport. For men, walking was not sufficiently vigorous to be considered 'exercise'.**

**Darker *et al* (2007 interviews ++ UK)** reported that young people, and especially young men, did not regard walking as vigorous enough to provide

exercise. Walking for transport required too much time out of a busy day. Walking for leisure was only acceptable if it included some form of team-work or challenge. For those that did walk for transport, listening to music was a facilitator as it drowned out noise from traffic and construction sites.

**Dunton *et al* (2006 survey + US)** reported that undergraduates found that lack of time, having a lot to carry, and wearing shoes that were uncomfortable were the most highly rated barriers.

***Applicability:*** *The findings from these studies are applicable to young people in the UK and US. Evidence reflects aspects of daily life that alter with changes through the life course. Participants in this study are constricted by timescales associated with the working day that might not apply to some other populations. There are also specific gender differences in perceptions of walking for fitness.*

*Adults*

Two surveys identify main barriers to leisure time physical activity. Cerin *et al* (2010) examined the extent to which Australian adult perceptions of barriers to leisure time activity are explained by individual, social proximal and social distal environment factors. The sample, aged 20-65 years, related lack of motivation, lack of social support, and time constraints as negatively related to weekly walking for recreation. Non-participation was predicted more highly by poor health, lack of motivation and lack of facilities than lack of skills or knowledge.

Soh *et al* (2006) investigated the exercise patterns of Australian anaesthetists and related these to demographic characteristics. The majority (79%) were male, median age 46 years. Of the 347 respondents, males (28%) were more likely to cycle than females (7%). The main reasons reported for carrying out regular physical activity were maintenance of physical health (71%) and weight control (35%). Reported reasons for not exercising regularly included fatigue (40%), being too busy (70%), having family commitments (67%) and a lack of interest (18%). Women were more likely to cite medical reasons (11.5% vs 1.7%), whilst male were more likely to report being too busy (76% vs 46%). Younger people were more likely to cite family commitments and fatigue as a barrier.

**ES11. Adult views about walking for travel or leisure (not related to an intervention)**

**Moderate evidence from two survey studies suggests that the main barriers to walking for travel or leisure for adults are related to time constraints, lack of support and lack of motivation. Women were more likely to cite medical reasons for not walking, whilst men were more likely to cite being too busy.**

**Cerin *et al* (2010 survey + Australia)** found that adults aged 20-65 years, related lack of motivation, lack of social support, and time constraints as negatively related to weekly walking for recreation. Non-participation was predicted more highly by poor health, lack of motivation and lack of facilities than lack of skills or knowledge. **Soh *et al* (2006 survey + Australia)** reported that anaesthetists' main reasons for carrying out regular physical activity were maintenance of physical health and weight control, whilst reasons for not exercising regularly included fatigue, being too busy, having family commitments and lack of interest. Women were more likely to cite medical reasons and men were more likely to report being too busy.

***Applicability:*** *The findings from these studies are applicable to adults in Australia. The evidence reflected concerns that alter with changes through the life course such as family and work commitments.*

*Older adults*

Six studies focused on the views of older adults about walking. For participants in one UK and two Canadian studies (Newton *et al* [no date]; Lockett 2005; Ripat *et al* 2010), the environment was a major factor in walking experiences. In one Canadian study (Lockett 2005), fear of crime and fear of being hit or splashed by vehicles on the road were barriers to walking outside. In the UK (Newton *et al* [no date]), most participants reported feeling safe from traffic but there were a number of obstacles that reduced this feeling. Pavements were reported to be narrow in a lot of local areas, creating difficulties walking and passing people without having to walk on the road. Parked cars were an obstacle that often caused narrowing of the pavement. Buses passing by at speed created feelings of instability, and cyclists riding on pavements were regarded as a risk, particularly when bells were not used as a warning. Older people reported not having enough time to get out of the way of cyclists and mobility scooters when out walking. Cycle tracks were received with mixed enthusiasm depending on the proximity of cyclists to pedestrians.

For some the track successfully segregated cyclists from pedestrians, but others felt that the paths forced pedestrians out toward the road, which is not the aim of cycle paths.

In both the UK and Canada, smooth surfaces were preferred as they were easier to walk on. In two Canadian studies (Lockett 2005; Ripat *et al* 2010), falling was feared, and the presence of snow and ice on pavements were particular hazards in this country. Clearing pavements of snow as well as roads was seen as important. Having to change walking patterns due to snow could be socially isolating. Suggestions for improving the situation were clearing snow more promptly in areas that were frequented by older adults, as well as clearing snow later into the season.

In one study (Lockett 2005), car parks were seen as poorly designed for pedestrians, and elderly people reported that stairs and entrances were often inaccessible to them. In addition, poor visibility at road crossings was a perceived hazard. Reported facilitators to walking were wider pavements and generally safer surfaces. Closer amenities, places where people could sit and take a rest were also valued, as were toilet facilities. Indoor and pedestrianised areas were valued as they offered cover from bad weather, safety from traffic as well as amenities.

Mackett *et al* (2001) aimed to identify barriers to walking in people in the UK that are at risk of social isolation and to identify policies to help overcome barriers. A Geographic Information System (GIS) database was assessed. Obstructions to mobility included crossings without dropped kerbs, narrow footpaths, and a dropped curb with a steep angle. The authors report that 19% of people aged >80 years could not reach key places if they need to pass through a gap of 1000mm.

The shopping mall is an example of an indoor, pedestrianised walking facility. One US study reported the views of eleven elderly mall walkers (Duncan *et al* 1995), three of whom initiated the practice following health advice. Mall walking was reported to fulfil a social role, enabling as it did the meeting of

new friends. Co-walkers needed to walk at a similar pace to establish a long-term partnership. Following retirement, the practice of mall walking served to fill the gap and provide a meaningful alternative to work. Mall walking also created a sense of belonging, since the walkers had established a community of walkers that shared customs, such as having coffee after a walk. Members also developed roles in which social control was actioned over others in order to maintain a particular code of conduct such as walking in the same direction around the mall. There was a shared belief that their self-discipline set the group apart from other elderly people that were less active. A bond was forged between group members, who regarded mall walking as requiring a degree of will-power. The environment offered a safe place in contrast to outside where the group felt more vulnerable.

One study (Lu *et al* 2011) assessed the practice of corridor walking in elderly residents of assisted living facilities. The main advantages of walking corridors were safety, comfort and convenience. Though some facilities had outdoor spaces, for those that did not, the disadvantage was a lack of things to see. Walking was carried out for transport to various activity rooms, for physical activity, and for social interaction. Safety was the main concern, so facilitators include handrails and appropriate floor coverings. Access to toilets and seating were also valued. The distances that could or needed to be walked were dependent on the layout of the facility, such as length of corridors. Views from windows and artwork were valued as making the walk more pleasing.

**ES12. Older people's views about walking for travel or leisure (not related to an intervention)**

**Moderate evidence from six studies suggests that the main facilitator to walking for travel or leisure in older adults was social interaction.**

**Barriers to walking for travel or leisure for older adults are related to limited mobility and fears for safety. These factors were mediated by the external environment, with fears of falling or of swift traffic being commonly voiced.**

**Walking indoors was a relatively safe and comfortable alternative if designed appropriately. Walking indoors also incorporated a social aspect to walking.**

Older adults reported factors that impacted on safety as the main barriers. When walking outside, narrow pavements and obstacles such as parked cars on pavements, and construction sites were barriers to access **(Newton *et al* [no date] interviews - UK)**. Traffic was also an issue, with cycle tracks and bus lanes creating hazards. Suggested improvements were wider pavements and better provision for cyclists.

In addition**, Lockett (2005 focus groups ++ Canada)** and **Ripat *et al* (2010 focus groups + Canada)** reported that fear of falling was a barrier to older adults, particularly in icy weather. Uneven pavements, car parks that are not designed for pedestrians were hazards. Older adults often require more time to cross roads, and it was reported that fast roads and poor visibility at crossroads were barriers to outdoor walking.

Suggestions for improving the walking experience for this group were access to toilets and seating, as well as adequate access to local amenities and pedestrianised shopping areas. Making sure that pavements were smooth and clear of snow and ice was also a factor **(Lockett 2005 focus groups ++ Canada).**

**Mackett *et al* (survey 2001 + UK)** reported that obstructions to mobility included crossings without dropped kerbs, narrow footpaths, and a dropped curb with a steep angle. The authors report that 19% of people aged >80 years could not reach key places if they need to pass through a gap of 1000mm.

Two studies assessed indoor walking for older adults. **Duncan *et al* (1995 observations & interviews ++ US)** reported on mall walking that not only contributed to improved physical activity, but also provided a social network and a meaningful work replacement following retirement. Routines were adapted and events were organised in a relatively safe environment compared to outdoors.

For older adults in assisted living facilities, **Lu *et al* (2011 focus groups ++ US)** reported similar facilitators in corridor walking, such as relative safety of being indoors, and the social incentive of meeting people in the corridors. Handrails were valued, as well as appropriate flooring, seating in corridors and adequate toilet arrangements. Public rooms needed to be thoughtfully placed to allow residents optimum access.

Reported barriers to this activity **(Lu *et al* 2011 focus groups ++ US)** were the lack of varied things to see compared with outside. Facilities with outdoor walking areas provided an opportunity to overcome this barrier providing the walking surfaces were adequate.

***Applicability:*** *The findings from these studies are applicable to older adults in the UK and North America. The evidence reflected safety concerns that alter with changes through the life course such as ageing. Participants in this study were constricted by limited mobility that might not apply to some other*

*populations. Social interaction is important for this population to prevent social exclusion.*

*Deprived groups*

Two studies assessed the walking experiences of people from deprived groups. The Ipsos study ([no date]) identified similar barriers to walking as in other included studies. Lack of motivation and laziness were reported, and for males, a lack of belief that walking provides sufficient exercise. For women, walking was more motivating when there was someone to walk with. Integrating walking into daily life was often difficult, particularly for women looking after young children and those with work commitments. In addition, participants reported that they were out of the habit of walking and instead were in the habit of not doing exercise. For those in one study (Ipsos [no date]), there was a suggestion that this difficulty could be overcome by breaking habits and getting into the habit of walking, perhaps with children, or a dog.

In another study (Bostock 2001), walking was imposed on low-income mothers who did not have access to a car. Mothers reported their feeling of social exclusion, and the de-motivating effect of walking through neglected neighbourhoods. There was also difficulty in encouraging young children to walk the distances required to go to the shops and back. Fear for the safety of their children in an environment dominated by motorised traffic was also expressed. Mothers became tired due to the physical exertion of walking long distances pushing a buggy.

There was a reported lack of awareness regarding how many local areas were available for walking. Those that established walking patterns reported the benefits on health and stress reduction, having time for ones' self, as well as being able to enjoy scenery. Some environments however, such as the city, and parks, were not seen as safe places to walk (Ipsos [no date]).

**ES13. Views of people from deprived areas about walking for travel or leisure (not related to an intervention)**

**Moderate evidence from two studies suggests that the main barriers to walking for travel or leisure in people from deprived areas were safety, lack of time and lack of motivation.**

**Women were constricted by perceived dangers from the external environment, family commitments, lack of motivation and lack of walking companions.**

**There was evidence that participants were either out of the habit of walking, or that walking was enforced due to a lack of options.**

**For men, walking was not sufficiently vigorous to be considered 'exercise'.**

Two studies assessed the views of populations from deprived groups. One study **(Ipsos / MORI [no date] interviews + UK)** reported that males did not associate walking with exercise as it is not strenuous enough. Women more often preferred to walk with someone else rather than alone, so walking with a friend, or children was an incentive. Walking with a dog was a motivator for men or women.

Though health benefits such as weight management and reducing aggression or boredom were recognised by those that did maintain walking activities, there was a habit of not walking that needed to be broken. Lack of motivation, other commitments, lack of time and bad weather were all barriers to continuing walking **(Ipsos / MORI [no date] interviews + UK).**

**Bostock (2001 interviews + UK)** examined the experiences of women without access to a car and reported feelings of social exclusion due to having to walk in neglected areas and often with very young children, who were tired. Women often had to walk long distances to shops, and feared for their children's safety at busy roads.

***Applicability:*** *The findings from these studies are applicable to people living in deprived areas in the UK. The evidence reflected safety concerns associated with perceived environmental dangers. Participants in this study were constricted by reduced options that might not apply to some other populations. Social interaction is important for this population to increase the feeling of safety, particularly for women. There were also specific gender differences in perceptions of walking for fitness.*

### 7.2.2 Adult views about walking or cycling for leisure or travel

One UK based survey and interview study (Pooley *et al* 2011) explored attitudes of adults living in a 'Cycling Demonstration Town' (Lancaster) toward

walking and cycling for either transport or leisure. A low response rate (10%) from the household survey gave 437 responses. Of these, 88% walk and 25% cycle at least once a week despite 705 cycle ownership. A third of respondents stated that there was no chance that they would cycle. A small minority (2%) stated they never walk, and 10% reported that they had no intention of walking regularly. Poverty as an explanation was rejected, and generally people expressed a strong sense of autonomy in respect of their transport choices.

Interviews with 20 adults and eight ethnographic case studies with households showed a complex interplay between family life and transport choices. Cars were used to transport children and elderly relatives and these responsibilities limited choices, therefore activities would be difficult to change. Some of the participants who could not find time to walk for transport walked for leisure; the latter was more relaxing and enjoyable.

There was ambivalence in the interview responses; both positive and negative views about walking and cycling were expressed. Confident walkers were often more constrained in relation to cycling. Walking was seen as an activity that the family could carry out together, and whilst owning a dog might encourage walking, it was difficult to cycle with a dog. Organising children to cycle was more complicated due to carrying belongings, and wearing appropriate clothing. Cycling also has implications for storage and maintenance.

The environmental benefits of walking and cycling were identified by one participant, though he felt marginalised as a non-car user. Travelling identities were reinforced by family, friends and the wider society. Walking and cycling are both valued for their sense of freedom but are also associated with negative images in terms of identity and risk.

**ES14. Adult views about walking or cycling for leisure or travel**

**Strong evidence from one study highlights the complex nature of transport choices, particularly for those with a family.**

**Pooley *et al* (2011 survey & interviews ++ UK)** found that people are more inclined to walk than to cycle, even if they own a bicycle. Major constraints to walking and cycling are the need to transport family members, particularly the very young and elderly.

Walking for leisure was often preferred to walking for transport because it is a way of relaxing, whereas walking for transport takes too long when there are time constraints.

Cycling also demands secure storage and regular maintenance as well as a degree of confidence.

***Applicability:*** *Findings from this study are applicable to people living in the UK contemplating walking or cycling for transport or leisure. There are particular complexities for people who have a family to transport.*

### 7.2.3 Views about active travel (walking and / or cycling) to school

Eight studies reported in nine papers and reports, five UK based (Kirby 2008; Black 2001; Davis & Jones1996 / Davis 2001; Granville *et al* 2002; Halden Consultancy 2003), two US based (Ahlport *et al* 2008; Beck 2008), and one Australian study (Stevenson & Lennie 1992) explored views about active travel in populations of schoolchildren (aged 10-14 years). Active travel in this context includes either walking or cycling to and / or from school rather than using motorised transport.

*Perceived benefits*

Benefits that were appreciated from active travel included health and physical activity gains, improved road awareness and confidence (Kirby 2008; Ahlport *et al* 2008; Granville *et al* 2002), greater independence (Kirby 2008; Ahlport *et al* 2008) and environmental benefits. Some children reported a sense of freedom and enjoyment (Kirby 2008).

*Facilitators*

Facilitators to active travel, especially walking, included the social aspect of meeting up with friends on the way to school (Kirby 2008; Granville *et al* 2002). This allowed more time to be spent with friends before school started.

Walking with a parent provided quality time together, though this was more of a facilitator for younger children (Granville *et al* 2002). Time in the car together was not regarded by children as quite so beneficial, as parents were concentrating on the road. Greater workplace flexibility allowed parents to encourage active travel in their children (Ahlport *et al* 2008).

Three survey studies assessed the transport practices of schoolchildren. Yeung *et al* (2008) assessed practices in Australia, including factors that affect parental decisions about active travel to school. Of 318 questionnaires returned, one third of children used active transport; these tended to have shorter distances to travel.

*Barriers*

Integrating walking or cycling into the daily routine was a barrier as it required time to make one's appearance presentable once at school. However, some children had always used active travel and so this was not a concern for them (Kirby 2008). In one US study, as well as children having to get up earlier to travel, it was the parents that found it difficult to integrate walking with children into their work commitments. Some parents did not encourage active travel as they were driving near to the school on their way to work (Ahlport *et al* 2008).

A survey by Ziviani *et al* (2004) showed that walking to school in Australian children (grades 1-7) was influenced by parental perceptions of physical activity (such as whether they had walked to school); whether parents worked; concern about children walking without company; concern about the child's safety and concern about attending out of school commitments, such as music lessons, and sport. Beck *et al* (2008) identified reasons for not walking to school in 5-14 year old children in the US. 2,274 responses from parents showed that the most common form of travel was by car (46%), followed by the school bus (40%), and lastly, walking (14%). Among those that did not walk, distance was the most common barrier, followed by traffic danger.

Barriers to active travel varied with age. Younger students feared intimidation from older pupils, and there was a fear of having bicycles stolen (Kirby 2008; Davis & Jones 1996 / Davis 2001). Fears for personal safety were commonly expressed by parents and children, and were based on fear of crime and negative perceptions about the local neighbourhood. Parents therefore restricted the outdoor movements of their children, whether walking or cycling (Kirby 2008; Davis & Jones 1996 / Davis 2001). Curfews were in place for older children in one study (Davis & Jones 1996 / Davis 2001). In the US study fears were mainly expressed by parents, and included abduction, bullies and the child's perceived inability to make rational judgements when dealing with traffic (Ahlport *et al* 2008). Having to carry heavy bags was other negative factor (Kirby 2008).

Stakeholders interviewed in one study (Halden Consultancy 2003) highlighted that despite children's general awareness about sustainable transport, efforts might be constrained by the nature of current lifestyles and also the reticence of schools to act on the opportunity to develop children's knowledge. Health related messages in schools could be conflicting, such as providing fast food. Learning in school may also conflict with circumstances at home, particularly if parents are working and do not have time to walk children to school. The trend toward consumerism and car ownership was a barrier, as was peer pressure. Some activities such as cycling may be seen as socially unacceptable in some groups unless the bike is 'cool' and expensive, which has implications for secure parking.

Whilst children were keen to walk and cycle in case study interviews, demand was suppressed by peer pressure, and parental choices related to timing of journeys and safety issues. Whilst independence was valued, there were also concerns about being a loner and needing to be with someone. There were issues of carrying belongings and getting wet; awareness of the convenience of using a car was evident. In a related survey, 88% of pupils saw themselves as travelling by car, for example to work, in the future.

The most important factor across year groups was getting to school on time. For parents, bike security and road safety were important, particularly for boys.

In three studies, environmental barriers that were of most concern were lack of adequate light in the morning, traffic volume, distance to school, and weather conditions. For cycling, designated lanes and routes away from traffic were seen as a facilitator (Kirby 2008; Ahlport *et al* 2008; Granville *et al* 2002) whilst hills were a barrier (Kirby 2008; Ahlport *et al* 2008).

**ES15. Views about barrier and facilitators to active travel to school (walking and / or cycling for transport)**

**Moderate evidence from nine studies suggested that the main facilitators to active travel included the social aspect of walking and spending time with friends, or having quality time with parents.**

**Barriers for schoolchildren contemplating active travel to and from school were parental and children's lack of time and perceived dangers from traffic and from intimidation or attack by other people. The missed opportunity by schools to develop children's existing awareness, and displaying conflicting messages was also a barrier. Peer pressure was an important factor for this age group in terms of choices.**

**Other reported barriers included distance, carrying heavy bags, and poor weather conditions. Parental habits and commitments were also influential on decisions about waking.**

**Barriers to cycling for children included a lack of cycle lanes and a lack of facilities to store bicycles.**

**The perceived image of cycling, and a dislike of wearing cycling helmets was also reported to be a barrier.**

*Walking or cycling*

Three studies **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US; Halden Consultancy 2003 survey & interviews + UK)** identified recognition in parents and children that walking or cycling would be beneficial to health and could increase a child's confidence and sense of independence around roads. In addition, two studies (**Kirby 2008 focus groups ++ UK; Granville *et al* 2002 focus groups + UK)** reported that walking with a parent provided valuable time together. Spending time with

friends was an important social aspect for older children **(Kirby 2008 focus groups ++ UK).**

However, barriers to walking or cycling included lack of time **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US; Granville *et al* 2002 focus groups + UK; Halden Consultancy 2003 survey & interviews + UK)**; parents often needed to accompany children to different schools and arrive at their place of work in time. Children and parents would need to get out of bed much earlier in the morning in order to fit in walking. Laziness was reported as a reason for not using active travel **(Kirby 2008 focus groups ++ UK).**

Peer pressure and the trend toward car ownership was a factor, particularly for cycling, which for some groups was socially unacceptable. Schools may also miss opportunities to develop children's knowledge about sustainable transport choices **(Halden Consultancy 2003 survey & interviews + UK).**

**Beck *et al* (2008 survey + US)** and **Yeung *et al* (2008 survey + Australia)** found that among children that did not walk to school, distance was the most commonly reported barrier, followed by traffic danger. Parents restricted their children to playing close to home on their bicycles (**Davis & Jones 1996 / Davis 2001 focus groups + UK)**

Children having to carry heavy bags of books and equipment was a barrier to both walking and cycling **(Kirby 2008 focus groups ++ UK; Granville *et al* 2002 focus groups + UK; Halden Consultancy 2003 survey & interviews + UK)**, as were bad weather, dark mornings **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US; Granville *et al* 2002 focus groups + UK)** and hilly terrain **(Granville 2002 focus groups + UK)**.

For older children who travel without an adult, there were fears for personal safety **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US)**, of accidents and abductions **(Ahlport *et al* 2008 focus groups ++ US),** of strangers and bullies **(Davis & Jones1996 /Davis 2001 focus groups + UK; Granville *et al* 2002 focus groups + UK)** and of busy traffic **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US; Davis & Jones 1996 / Davis 2001 focus groups + UK; Granville 2002 focus groups + UK).** Environmental factors such as poor lighting, secluded areas or woodland on the journey exacerbated these fears **(Kirby 2008 focus groups ++ UK; Ahlport *et al* 2008 focus groups ++ US; Davis & Jones 1996 / Davis 2001 focus groups + UK; Granville *et al* 2002 focus groups + UK).**

**Ziviani *et al* (2004 survey + Australia)** showed that parental perceptions were a factor in decisions to walk. These included parents own physical activity habits, parental working schedules, and parental concerns about safety. Having to attend out of school activities was also a factor.

*Cycling*

Cycling was associated with particular barriers, such as lack of cycle lanes, and general support for cycling at school such as provision to store bicycles and helmets **(Kirby *et al* 2008 focus groups ++ UK; Granville 2002 focus groups + UK).** Fear of having a bicycle stolen was a disincentive **(Kirby *et al* 2008 focus groups ++ UK; Davis *et al* 1996 / 2001 focus groups + UK).**

The image that cycling conveyed was an issue for some. For teenage girls, cycling was perceived as childish **(Granville *et al* 2002 focus groups + UK).** For children that did cycle, the 'coolest' bike was required **(Granville *et al* 2002 focus groups + UK),** and cycling helmets were regarded as 'uncool' **(Kirby 2008 focus groups ++ UK; Stevenson & Lennie 1992 action research + Australia),** lacking in style and fit, with consequences such as negative comments from others **(Stevenson & Lennie 1992 action research + Australia).** In addition, cycling impacted on personal appearance; for example, cycling helmets dishevelled one's hair **(Kirby 2008 focus groups ++ UK).**

***Applicability:*** *The findings from these studies are partially applicable as the findings are specific to schoolchildren. Whilst some barriers and facilitators to active travel are applicable to any population, schoolchildren and their parents face particular issues pertaining to safety and practicalities for children. Some barriers differ by age group and gender.*

### 7.2.4 Suggestions for strategies to encourage active travel to school (walking and / or cycling for transport)

In the UK studies, motivators to carrying out active travel were mainly based on support or encouragement from parents and the school as well as children's own awareness of the benefits. For example, provision of cycling or walking groups at school, secure storage for bicycles and cycling proficiency / awareness courses were suggested motivators (Kirby 2008; Granville *et al* 2002), as well as incentives such as rewards. De-motivators included laziness, and the perceived image of cycling. In particular, wearing cycle helmets was a disincentive. Helmets were regarded as 'uncool', and were blamed for messing up one's hair (Kirby 2008; Stevenson & Lennie 1992). They were also perceived as poorly designed, poorly fitting, hot and heavy, as well as expensive (Stevenson & Lennie 1992).

Black *et al* (2001) tentatively suggested that modifying attitudes to car-centredness would be a more useful policy than promoting general environmental awareness.

**ES16. Suggestions for strategies to encourage active travel to school (walking and / or cycling for transport)**

**Moderate evidence from five studies provided suggestions for strategies that might encourage safe active travel in schoolchildren.**

**Suggested strategies included environmental improvements to increase safety, changing attitudes to car use, school based campaigns to assist in cycling skills and awareness, and personal level encouragement by provision of storage facilities and better design of cycling helmets.**

Suggested strategies that may overcome some of the reported barriers included employing crossing patrols near to schools **(Ahlport *et al* 2008 focus groups ++ US),** escort schemes, traffic calming schemes, and pedestrian training **(Granville *et al* 2002 focus groups + UK)**.

**Black *et al* (2001 survey + UK)** reported that modifying attitudes to car-centredness would be a useful policy; more so than promoting general environmental awareness.

To reduce cycling accidents, improved cycle paths and compulsory helmet wearing was suggested in one study **(Stevenson & Lennie 1992 action research + Australia).**

Other suggestions included schools organising walking and cycling groups, providing training in cycling proficiency, and support such as storage for wet clothes and bicycles **(Kirby 2008 focus groups ++ UK; Granville *et al* 2002 focus groups + UK; Stevenson & Lennie 1992 action research + Australia).**

Improved design of cycling helmets might impact on their use and on cycling behaviour by children **(Stevenson *et al* 1992 action research + Australia)**.

***Applicability:*** *The findings from these studies are partially applicable as the findings are specific to schoolchildren. Whilst some suggestions to encourage active travel are applicable to any population, schoolchildren and their parents face particular issues pertaining to safety and practicalities for this age group.*

### 7.2.5 Views about walking and cycling trails for leisure (utilising walking / cycling trails)

Three papers (Cavill & Watkins 2007; Ravenscroft *et al* 2002; Ravenscroft 2004) describe the findings of focus groups with users and non-users of

walking and cycling trails. One survey (Siderellis *et al* 2010) assessed the preferences of bikers.

In one paper (Cavill & Watkins 2007), the sample discusses a potential cycling intervention that uses a specified trail in Liverpool. In Ravenscroft *et al* (2002), the sample is drawn from communities living near to five UK trails around the UK, and in Ravenscroft (2004), three trails are included from the original five. The main difference between these papers and previous descriptions is a focus on trails that provide shared space, for amongst other functions, leisure walking and cycling. They are relatively free from motorised traffic and so are promoted as safe environments.

*Perceived benefits*

Reported benefits of the trails included being close to nature; trails offer a rural environment that is often surprisingly accessible to urban communities (Ravenscroft *et al* 2002). Experiencing fresh air and weight management were also reported benefits (Cavill & Watkins 2007). Though safety was an issue for some and at certain times, generally the trails were regarded as safe and offered a way of escaping pollution, noise and traffic dangers (Ravenscroft *et al* 2002).

*Preferences*

One survey study (Siderellis *et al* 2010) assessed biking trail use in 398 US mountain bikers (82% male) that had access to a regulated legal trail. Trail users preferred sites with higher quality trail conditions and more challenging routes.

*Perceived barriers*

A major barrier to use could be that many people are unaware that trails continue into the countryside. Lack of car parking close to trails was a barrier to access (Ravenscroft 2004). When the trail is not continuous, fears of having to deal with traffic are evident (Cavill & Watkins 2007). There was a perceived lack of safety and reports of poor surface conditions or lighting. Those that had previously visited trails but no longer did so were de-motivated by the fear

of crime, and the feeling of intimidation. Perceived lack of safety was particularly pertinent for women, and at night, and was mainly related to environmental features such as undergrowth and darkness that might provide places for assailants to hide, as well a lack of use at these times (Ravenscroft 2004). There were perceptions that trails were a common place for gangs to hang out at night (Cavill & Watkins 2007).

Perceptions of risk from crime were often associated with media coverage of assaults that had occurred in similar environments. Having another person or a dog to walk with was regarded as a safer option. Having someone else around was also necessary in case of accidents or injuries so that help could be called (Ravenscroft 2004).

Shared use was also viewed positively by most participants. However, whilst lack of people around was a perceived threat on one hand, on the other, trails could become crowded on Sundays. Some preferred to use different areas such as parks as they did not view the trails as compatible with their usage. There were comments about inconsiderate users; this is where walkers and cyclist views polarised and the sense of sharing was questioned. For walkers, there was a sense of togetherness between walkers; they could walk together and hold conversations. Some cyclists, particularly those that were perceived to be interested in cycling for sport rather than leisure, were perceived as inconsiderate, a potential hazard and 'other' ('*what the walkers were not'* p. 34). There was an implication that the trail is dominated by those wishing to pursue sports, with cyclists rushing up behind. Despite, this, there is an implied acceptance as walkers stand by for cyclists to pass. Recreational cycling (carried out by walkers as well) was distinguished from cycling as sport. Those that pursue sport cycling perceived walkers as an unpredictable obstacle and the potential cause of accidents (Ravenscroft 2004).

**ES17. Views about walking and cycling for leisure, utilising trails**

**Moderate evidence was found from four studies assessing the views of users, ex-users and non-users of walking / cycle trails.**

**Reported benefits of using trails included the ability to share space. Trails were reported to provide the opportunity to walk or cycle among nature, away from traffic and pollution.**

**Barriers include crowding at certain times, fear of accidents and fear of crime, particularly for women alone. Access to trails was a reported barrier for some, and there was evidence of lack of awareness about trails as a means of accessing the countryside. Challenging trails in good condition were preferred by mountain bikers.**

**Barriers to walkers and cyclists sharing the same space were reported. Walkers regarded their activity as partially social, whilst adult cycling was viewed as a sport. Non-users of trails reported perceived incongruence in walkers and cyclists sharing the same space.**

**Suggested ways to overcome safety fears included walking with others or with a dog.**

Users of the trails reported benefits such as being at one with nature **(Ravenscroft *et al* 2002 focus groups + UK)**, being able to escape from congestion and pollution, see wildlife, and either walk or cycle in a relatively safe, quiet and peaceful environment (**Ravenscroft 2004 focus groups + UK).** Experiencing fresh air and weight management were also reported benefits **(Cavill & Watkins 2007 focus groups ++ UK).**

**Siderellis *et al* (2010 survey + US)** found that mountain bikers preferred sites with higher quality trail conditions and more challenging routes.

However, in one study with potential trail users **(Cavill & Watkins 2007 focus groups ++ UK)**, there had been an apparent lack of awareness for some that they could access the countryside from the trail. Lack of nearby parking restricted access to trails **(Ravenscroft 2004).** Fears were expressed that traffic that might be encountered, as the trail does not run a continuous path. Some potential participants feared falling off the cycle, or of having their bike stolen **Cavill & Watkins 2007 focus groups ++ UK)**.

Users also reported disadvantages to using the trails, such as crowding on Sunday afternoons, inconsiderate users who shared the space, and the fear of accidents. In particular, walkers felt that cyclists might appear rapidly behind them on the path and this could be dangerous. Having someone to walk with was reported as important, particularly by women, in case of emergencies **(Ravenscroft *et al* 2002 focus groups + UK)**.

Fear of crime was also reported, particularly by women and ex-users of the trails. Poor lighting, being alone at night, the perception that gangs hang out in specific areas, and the availability of cover afforded by shrubbery exacerbated these fears (**Ravenscroft *et al* 2002 focus groups + UK; Ravenscroft 2004 focus groups + UK; Cavill & Watkins 2007 focus groups ++ UK).** Walking

with other people or with a dog were suggested ways of overcoming these barriers **(Ravenscroft 2004 focus groups + UK)**

In terms of sharing space, non-users of the trails perceived sharing by walkers and cyclist to be incongruent, as cyclists are travelling faster for sport and walkers need to move out of the way for them. There was evidence of camaraderie among walkers, who could converse together, whilst cyclists reported a sense of 'otherness' **(Ravenscroft *et al* 2002 focus groups + UK).**

***Applicability:*** *The findings from these studies are applicable to people who use or may be considering using walking and cycle trails within the UK and US. Perceptions about shared use differed between types of user. There were gender differences in perceptions of safety.*

### 7.2.6 Adult views about cycling for transport

Six studies assessed views about cycling for transport. Three focused on adults in the UK commuting to work (McKenna & Whatling 2007; Granville *et al* 2001; Steinbach *et al* 2011). One UK survey and interview study (Gaterslaben *et al* 2007) assessed readiness to cycle in an academic UK population and the experience of cycling in new cyclists. Two Australian surveys (Garrard *et al* 2008; Wen *et al* 2010) assessed the activities and preferences of cyclists.

*Motivators and de-motivators*

Commuters were motivated to cycle because it was a quick and efficient way of getting to work. Cyclists can bypass traffic and sense autonomy and freedom from reliance on public or private motorised transport. In addition, it provided physical activity and had benefits for the environment. For men, cycling was a way of showing their physical prowess, whilst for women, cycling was a way of shaping their bodies (Steinbach *et al* 2011). Wen *et al* (2010) reported that parents were less likely to drive to work when employees encouraged cycling practices. Cycling was particularly enjoyable in good weather, when journeys were more likely to be extended beyond the shortest route (McKenna & Whatling 2007).

Gaterslaben *et al* (2007) reported that people who were almost ready to cycle would be motivated by better weather, flatter terrain, and more safe cycling facilities. New cyclists who enjoyed the experience felt a sense of thrill when cycling at speed, achievement at cycling uphill, and they also valued being in the fresh air. Less positive aspects were poor weather, saddle soreness, tiredness and cycling uphill.

Conversely, cycling was not so enjoyable in wet weather, and on polluted and poorly maintained roads. Obstacles on the road included manholes, parked cars, buses, deep drains and pedestrians. The journey was therefore often stop-start rather than continuous, and was particularly uncomfortable in wet clothing (McKenna & Whatling *et al* 2007). Traffic was a hazard, there was a risk of accidents and participants reported having to have their wits about them, particularly when turning right across the traffic.

*Preferences*

Garrard *et al* (2008) observed Australian female cyclists at 15 locations to investigate whether they use facilities that are more separate from motorised vehicles compared to males. Male cyclists (n = 5229; 79%) outnumbered female cyclists (n = 1360; 21%) at all 15 locations. The proportion of females to males varied according to the type of bicycle facility. After adjustment for distance travelled, females showed a preference toward off-road paths compared to roads with no facilities, and off-road paths compared to on-road lanes.

*Perceived barriers*

Cyclists often reported feeling invisible to other road uses (McKenna & Whatling 2007), and yet for those in areas not used to cycling, cycling was identified as ‘strange’, masculine, white, middle class and carried out by a certain type of person who held particular political and environmental views (Steinbach *et al* 2011). Such perceptions necessitated constructions, particularly for women, of their femininity. Some women carried clothes to work and changed there; this required extra time out of the morning (McKenna

& Whatling 2007) whilst others cycled in heels (Steinbach *et al* 2011). Turning up to work with a cycling helmet was reported to be embarrassing for some. Black women tended to become acquainted through their cycling because of their rarity on the roads.

**ES18. Adult views about cycling for transport**

**Moderate evidence from five studies was available regarding barriers and facilitators to adult cycling for transport.**

**Benefits of cycling for transport were reported motivators, such as the ability to travel relatively quickly through traffic, the feeling of autonomy and freedom, and benefits for health and the environment. Cycling rather than driving could be encouraged by workplace initiatives.**

**Barriers to cycling were reported such as obstacles in the road, pollution and poor weather. Carrying bags and changes of clothing required after getting wet were also reported disincentives.**

**Cycling for transport requires negotiating space on the road; major barriers were traffic volume, inconsiderate driving and lack of adequate cycling tracks.**

**Some cycling behaviours were perceived as inappropriate by some other road users, giving cyclists a poor image and limited relationship with drivers.**

**Cycling was perceived as male, white and middle class. There was evidence that resistance to this image from female cyclists includes adopting and disseminating ideas for a feminine cycling image.**

Reported benefits from commuting by bicycle included swiftness of travel through busy traffic, not having to rely on public transport, and improved fitness (for men) or body shape (for women). An additional factor was reassurance that the environment is being protected (**Steinbach *et al* 2011 interviews + UK).**

Parents were reported to drive less to work when cycling was encouraged by their workplace **(Wen *et al* 2010 survey + Australia).**

However, cyclists in the city report a number of obstacles that can interrupt the journey, such as poor road surfaces, manhole covers, glass, rough gutters, hilly terrain, parked cars and buses. In addition, pollution and bad weather can be a disincentive (**McKenna & Whatling 2007 interviews ++ UK; Gaterslaben *et al* 2007 survey & interviews + UK)**. **Garrard et al (2008 survey + Australia)** reported that women cyclists preferred off-road paths compared to roads with no facilities, and off-road paths compared to on-road lanes.

Commuting by cycle often involved carrying extra clothes to work and extra time at work to get changed from cycling outfits to work attire, including re-structuring hair after wearing a helmet **(Steinbach *et al* 2011 interviews + UK).** Lack of available facilities was a barrier to cycling, as were saddle soreness and tiredness **(Gaterslaben *et al* 2007 survey & interviews + UK).**

Cycling on the road also requires negotiation with other road users. Cyclists reported fears of traffic and of accidents **(Steinbach *et al* 2011 interviews + UK)** which meant having to be constantly alert for other traffic in order not to collide, and feeling vulnerable when crossing traffic to turn right (**McKenna & Whatling 2007 interviews ++ UK)**.

Cyclists reported feeling segregated and invisible on the road (**McKenna & Whatling 2007 interviews ++ UK)**. In areas where cycling is traditionally less prominent, there was a 'strangeness' about cycling, which was internalised by cyclists. There was also a perception that cycling is a male (predominantly White) activity, and some women felt the need to construct their own cycling identity, which could mean resisting the 'blokey' image and embracing femininity (e.g. wearing heels whilst cycling; using blogs to reinforce identity) **(Steinbach *et al* 2011 interviews + UK).**

***Applicability:*** *The findings from these studies are applicable to cyclists who commute in the UK and Australia. Differences in experiences between cycling populations (gender, ethnicity, etc.) and between settings in their promotion and support of cycling need to be taken into account.*

*Cycling identities*

One UK report that sampled the general population (Granville *et al* 2001) identified issues around negotiation of road space between cyclists and other users. Some cyclists were perceived as displaying poor behaviour on the roads, such as cycling through red lights, not wearing appropriate safety clothing or using lights when dark. This contributed to a poor image of cyclists by car drivers, who were also concerned about colliding with cyclists on the road. Drivers that also cycled were most likely to empathise with cyclists and watch out for them whilst driving. Differences in the pace of driving and cycling created difficulties at certain points on the road such as crossroads and roundabouts.

Positive images of being environmentally friendly and considerate cyclists were also apparent, and were ascribed to 'professional cyclists'. Cycle paths

were regarded as confusing and inadequate by cyclists and drivers. Drivers often parked on cycle lanes, making them unusable. Suggested ways of improving the shared space situation were cycling proficiency training, raising the awareness of rules and regulations for road users in respect of all users (not just car driving) and charging cyclists road tax so that their profile would be raised. There was a perceived hierarchy on the road where cyclists were not prioritised.

**ES19. Views about cycling identities**

**Moderate evidence from one study that obtained car driver views of adult cycling identities.**

**Cycling for transport requires negotiating space on the road. Some cycling behaviours were perceived as inappropriate by some other road users, giving cyclists a poor image and limited relationship with drivers.**

Car drivers reported being fearful of collisions, since cars and cycles travel at different speeds, and gave cyclists a wide berth. Some cyclists were reported as behaving poorly on the roads, for example passing through red lights, and this contributed for some, to cyclists having a negative image. Drivers that cycled were more likely to have empathy with cyclists on the road. Cycling proficiency testing, road taxes and compulsory helmet wearing were suggestions for improving the status of cyclists on the road (**Granville *et al* 2001 focus groups & interviews + UK).**

***Applicability****: Findings from this study is applicable to car drivers in the UK. How cyclists are perceived by other road users and the impact that this may have for cyclists needs to be taken into account.*

## 8. DISCUSSION

### 8.1. Summary of identified research

In total 47 papers describing 46 studies using a range of study design were selected for inclusion in the review.

For those organising interventions, evidence was only available for facilitators and barriers to implementing walking interventions. Organising walking groups can be motivated by the personal benefits of walking and by a sense of helping others. However, some issues that may require attention when designing programmes are planning time, collaborative issues where associations are working together, and the involvement of staff at the planning stage. Where groups or associations are collaborating, having one person to co-ordinate between different stakeholders facilitates implementation. The burden of recruitment and how this might be facilitated, for example through marketing training, is also a factor. Sole responsibility for designing walking routes and for the safety of others might be lessened by involving other walking group members and other walking groups.

Whilst a number of benefits from walking were cited, people may not be sufficiently motivated to walk outside of a group. Participation in walking groups can enhance motivation through having role models, and through the social interaction that is associated with groups. Social interaction was a particularly important aspect of walking interventions for older adults, women and families. Family based interventions can stimulate the enjoyment of walking in children and families. Having organised routes to walk can also be motivating. Self-monitoring and pedometer use may be motivating in some individuals or groups though acceptability of the element of competition needs to be considered.

Maintaining interest in walking may be achieved by using incentives, or through support from peers and family. There is a particular need to find ways of integrating walking into daily life, particularly for younger groups that have family and work commitments. Other barriers include physical and psychological limitations. Overcoming barriers can involve re-examining time

management and involving the family as well as having a positive attitude to the activity.

Participating in cycling interventions can be facilitated by providing adequate facilities such as secure storage, showers, and changing facilities at schools and workplaces. This is particularly important as many journeys involve cycling for some distance. For young people a fun aspect is required, as well as a social element. Image concerns are also salient for this population.

Outside of organised interventions, walking for travel or for leisure is deterred by lack of time in younger people, and for men, by a lack of belief in walking as a form of exercise. For older adults, safety issues are important, with fears of falling related to inconsistent external environments. The social aspect of walking is also important, particularly post-retirement. Indoor walking is one way of achieving a safe and social setting for walking.

People living in deprived areas may be de-motivated from walking due to neglected local environments. Individuals may thus get out of the habit of walking, and motivators are required to alter this situation. However, walking with small children for long distances is enforced for some women in these areas.

For schoolchildren and their parents, walking or cycling to school is perceived to have health and social benefits. However there are also perceived dangers from busy roads as well as strangers and older children. The distance required to travel, as well as the lack of convenience when several children need to be at school at the same time can also deter active travel. Fear of having a bicycle stolen, and having to carry heavy bags are also barriers. Barriers could be overcome by school based strategies that encourage and develop awareness as well as support active travel.

Shared trails for walking and cycling are valued for the opportunity to walk and cycle in a traffic free environment. However, concerns by walkers that cyclists in these environments are mainly cycling for sport, and could pose a danger to

walkers. In addition, walkers perceived risks of crime and attack at times when trails were quiet. Some may feel intimidated by youths in the area.

Cycling to work has reported health benefits to the individual as well as being an environmentally friendly, efficient way of travelling through traffic. However, many people that own cycles do not use them and lack confidence, particularly if there are barriers such as hilly terrain and/ or a lack of suitable cycle lanes. Cycling is often marginalised, partly because of a perceived image of cyclists as inconsiderate or in some way different, but also because cyclists are competing for space against vehicles that provide more protection to their drivers than do bicycles. Cycling also requires that bicycles are stored securely, and that provision is made for showering and changing clothes at work. Women and ethnic groups are less well represented as cycling commuters, though resistance is beginning to occur among some female groups to allow the integration of feminine expression and cycling.

### 8.2 Applicability in the UK context

More than half of the included studies were carried out within the UK. Within the UK, walking and cycling facilities vary across geographical locations, and feasibility may be restricted by terrain. In addition, deprived areas may be less attractive to negotiate on foot or by cycle. Interventions also need to take into account the target population; findings show that barriers to walking and cycling differ by age, gender and ethnicity.

Findings from studies carried out in countries other than the UK may be applicable to UK settings where geographical areas and populations are similar. Some general differences need to be taken into account. Weather conditions may be better, or more extreme, in the US, Canada and Australia than in the UK, therefore presenting a lesser or greater barrier to those attempting to be active outdoors. In the US, pavements may be less accessible for walking, and wildlife in some countries may be more of a threat than in the UK. A number of US studies focused on African American

population, whose beliefs around lifestyle choices may differ to those of ethnic groups within the UK.

### 8.3 How these findings relate to the wider literature

Findings from this review relating to the views of schoolchildren, young people and parents are supported by a systematic review (Lorenc *et al* 2008) about walking and cycling. A culture of car use was reported. Car ownership was regarded as 'normal and 'cool'. There was also a dislike of environmental aspects such as traffic, and lack of facilities. Safety from perceived crime and theft were also reported. The views of children and parents sometimes diverged; parents were seen as having a concern for their children that limited their independence. The review concluded that interventions need to be tailored according to age, sex, and location.

### 8.4 Implications of the review findings

Findings show that interventions for walking and cycling require understanding of population groups and their requirements. For some, mainly younger people and males, an element of competition is motivating. For children, older people and females, social interaction and safety are major considerations.

For schoolchildren, safe active travel may be encouraged by awareness raising and by forming educational groups at school. In addition, family-based interventions encourage parents to walk with their children and children to enjoy walking. Cycling requires adequate competence as well as facilities for storage and changing. Cycling identities need to be addressed to encourage equal participation between population groups.

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## 10. APPENDICES

## 10.1 Appendix 1: Evidence table for included studies

## a) Qualitative studies

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| **Author**: Ahlport<br><br>**Year**: 2008<br><br>**Setting / country**: North Carolina; US<br><br>**Aim of study**: To explore barriers and facilitators to walking or cycling to school in 4th and 5th grade students.<br><br>**Study design**: Focus Groups<br><br>**Funding**: National Institutes of Health<br><br>**Quality**: ++ | **Number and characteristics of participants**:<br>Four elementary schools<br>37 children with no access to a school bus service (1.5 mile radius of school) and one of their parents.<br><br>26 Active Travellers (AT)<br>11 Non-active travellers (NT).<br><br>Mean age of children = 10 years<br><br>Gender evenly split. Parents were mainly White (94.6%). | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>6 Parent focus groups (1.5 hours)<br>6 Student focus groups (1 hour)<br><br>**Data Analysis**:<br>Framework: Social ecological and political economy of health.<br><br>NVivo software | **Main Themes relevant to research question**:<br>*Parent and child factors*<br>Personal safety barriers:<br>• Parent fears of child abductions<br>• Parent fear of child walking alone<br>• Lack of parental peace of mind<br>• Parent fear of child being involved in accident<br>• Parent fear that child will make immature judgements<br>• Bullies<br>Personal safety facilitators:<br>• Someone to walk with child<br>• Early notification from school of missing child<br>• Siblings walking together (or having to take younger child in car anyway as they are asleep)<br>Time management barriers:<br>• Inflexible work schedules (may need to drive past school at that time anyway)<br>• No time in mornings<br>• Driving is convenient<br>Time management facilitators:<br>• Workplace flexibility<br>Motivation:<br>• Having to get up early<br>• No energy or strength<br>• Desire for child to get exercise<br>Benefits:<br>• Increased independence for child | **Limitations identified by author**:<br>Lack of representativeness (e.g. ethnicity, SES).<br>Inability to quantify and compare AT / NAT results.<br>Single coding rather than dual coding of data.<br><br>**Evidence gaps and/or recommendations for future research**:<br>More research with diverse populations in relation to age, ethnicity and SES.<br>Explore how best to intervene at community level.<br><br>**Applicability**<br>Study carried out in US. School bus system appears different from UK; not |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| | | | Physical environment:<br>• Lack of adequate pavements<br>• Weather (cold, wet, for parents; hot for children)<br>• Distance<br>• Terrain (hills – mainly for cycling)<br>• Traffic (inconsiderate drivers, busy junctions, unorganised car / bus drop off zones).<br>• Dark mornings<br>• Vegetation not trimmed<br>• Lack of biking support such as lanes, stands, helmet and coat storage)<br>• Secluded areas<br>• Routes that avoid main roads are facilitators<br>School attributes:<br>• Policies (early start 7.30 – 7.50 making it difficult to get up early enough to walk / cycle / Dark mornings). Having to designate child as a walker, cyclist or rider.<br>• Crossing patrols a facilitator<br>• Heavy school traffic<br><br>A range of possible interventions is suggested to address the barriers and support facilitators. | sure if children can access public transport. |
| **Author**: Bostock<br><br>**Year**: 2001<br><br>**Setting / country**: Midlands, UK<br><br>**Aim of study**: To explore the ways in which carlessness enforces mothers to confront their disadvantage. | **Number and characteristics of participants**:<br>30 mothers receiving social security benefits.<br>50% lone mothers<br>60% White<br>Remaining mothers Black, Pakistani, Indian, Gujerati Muslim.<br><br>27 in rented accommodation<br>28 had no car. | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>Interviews:<br>Caring on low income<br><br>**Data Analysis**:<br>Exploring convergent and divergent themes. | **Main Themes relevant to research question**:<br>*Confronting disadvantage: women's experiences of walking*<br>• Walking to the shops is where mothers face the extent of their social exclusion.<br>• Low income compels women to walk, in areas that are littered and neglected.<br>• Daily stress of having to walk a significant way to the shops with tired children every day, especially in poor weather.<br>• Children cry to be carried, and often there is a large amount of shopping to bring home.<br>• Walking involves keeping children safe from dangerous roads and careless drivers. | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability**<br>UK study with diverse population. Specific to low SES groups |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| **Study design**: Interviews<br><br>**Funding**: ESRC Industrial Collaborative Award<br><br>**Quality**: + | 20 / 30 rated their health as fair / poor | | • Poor people have to walk as primary transport. Walking with young children adds to anxiety<br>•<br>*Accessing hospitals, holidays and human resources*<br>• Most mothers could access a GP practice within walking distance but taking children to hospital was difficult<br>• They would 'save up' asking family to help with transport so as not to be too demanding.<br>• Family further away were more difficult to visit without a car and with several young children. | and mothers so may be generalisable to these groups, particularly those without car access. |
| **Author**: Burroughs<br><br>**Year**: 2006<br><br>**Setting / country**: South Carolina; US<br><br>**Aim of study**: To develop a social marketing programme to promote walking and other moderate-intensity activities.<br><br>**Study design**: Focus Groups<br><br>**Funding**: Centres for Disease Control and Prevention (CDC). | **Number and characteristics of participants**:<br>Phase 1:<br>Diverse members of community.<br>12 groups varying in age, ethnicity and activity level.<br>27 men<br>63 women<br>63% Black<br>33% White<br>2% Hispanic or Asian<br><br>Phase 2:<br>5 focus groups<br>43 women<br>Age 35-54<br>2 groups regularly active (30 minutes of moderate activity on 5 days of week or 20 minutes of vigorous activity on 3 days of week)<br>3 groups some activity | **Intervention aims and content if applicable**:<br>NR<br>Behavioural recommendation was walking and other moderate-intensity activities for at least 30 minutes on 5 days of the week.<br><br>**Data collection methods**:<br>Phase 1:<br>Focus Groups (75-90 minutes) held at local community centre, a local church or recreation and parks department.<br>17 scripted questions on product, price, place and promotion as well as probing.<br><br>Phase 2:<br>Focus groups:<br>• Distinguish between physical activity and exercise and define moderate activity.<br>• Opinions about pedometers<br>• Images that promote activity<br>• Name or describe convincing spokes persons who would | **Main Themes relevant to research question**:<br>Phase 1: On basis of findings, community advisory council selected less active women aged 35-54 as target audience.<br>*Product*<br>Benefits of walking reported were transportation (lower SES), relieving stress, spending time with family and friends, and health.<br><br>*Positioning*<br>Strategies to encourage family and friends included emphasising body toning, social support, and decreased health risks.<br><br>*Costs*<br>Perceived price varied among participants. Most believed their lives were too busy to schedule regular walking. In addition, the discomfort of a hot, humid climate were cited.<br><br>*Place*<br>Most preferred walking in the morning or early afternoon. Some in all groups preferred walking alone, and some with others. Most females preferred the latter. Local neighbourhood was most cited place. Though the mall offered structured walks it was assumed these were for older adults. Several local trails are available for walking purposes. Perceptions of these ranged from appreciation | **Limitations identified by author**:<br>Focus groups not representative of entire population, and responses may influence others in the group.<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability**<br>Study carried out in US; walking facilities differ from UK. Climate appears to be hot and humid, which is rare in the UK. |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| **Quality**: ++ | but not as recommended above. | encourage them and their friends to be active.<br>• Radio and TV most likely to listen to.<br><br>**Data Analysis**:<br>Coding by 2 researchers. | because of foliage and tranquillity to suspicions that they were unsafe, especially for women. Also there were reports of pet waste, litter and inadequate lighting.<br><br>*Promotion*<br>Walking groups favoured as they provide support, security, child-care. Men were less keen on groups since they like to walk at their own pace.<br>Incentives such as athletic shoes, hats, t-shirts, certificates were mentioned.<br><br>Phase 2:<br>Based on phase 1 data women aged 35-54 were invited to group discussions.<br>Exercise was defined as 'structured activity' and PA as unstructured, or incidental activity. Exercise was intentional, purposeful and deliberate, and the term was preferred to PA.<br>Moderate activity was seen to require exertion to be beneficial.<br>Most were willing to try a pedometer to set daily goals.<br>Images of women exercising were reported to be motivating; spokespeople should be of various ages, ethnicity and body shape. Identification with these people important.<br>Wide range of preferred radio and TV stations. Most likely to listen to radio in the car. Women felt that telephone calls as a means of feedback were intrusive, preferring e-mail or mail. | |
| **Author**: Cairns<br><br>**Year**: 2010<br><br>**Setting / country**: UK<br><br>**Aim of study**: To assess 20 case studies of employers | **Number and characteristics of participants**:<br><br>20 organisations across the UK who had travel plans in place. | **Intervention aims and content if applicable**:<br>Workplace travel initiatives<br><br>**Data collection methods**:<br>Questionnaires<br>Interviews<br><br>**Data Analysis**:<br>Difference between number of commuter cars per hundred staff | **Main Themes relevant to research question**:<br>*Cycling*<br>The factors most associated with high levels of cycling included:<br>• High quality or improving off-site access,<br>• Increase in availability of parking for cyclists<br>• Having a Bicycle Users Group<br>• Offering a cycle repair service<br>• Providing showers, changing and drying facilities and / or lockers | **Limitations identified by author**:<br>Travel planning is poorly understood<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| undertaking travel planning.<br><br>**Study design**: Survey and interview<br><br>**Funding**: Rees Jeffreys Road fund.<br><br>**Quality**: + | | arriving at the organisation pre and post travel plan implementation. | • Discounts and promotions on cycle equipment<br>• Organisational attitude to cycling<br>• Better security for bikes<br>• Cycle equipment loans<br>• Cycle maps<br>• Financial incentives<br>• Complimentary products<br><br>*Walking*<br>The factors most associated with high levels of walking included:<br>• High quality or improving off-site access,<br>• High quality on-site conditions (crossings, speed restrictions etc.)<br>• Marketing walking to staff (using health as motivator)<br>• Providing security, changing and drying facilities and / or lockers (these were already in place for cyclists in some organisations)<br>• Health walks at lunchtime<br>• Organisational attitude to walking (most neglected mode of travel)<br>• Financial incentives<br>• Complimentary products (maps, pedometers) | **Applicability:** Applicable to other UK workplace initiatives. |
| **Author**: Cavill<br><br>**Year**: 2007<br><br>**Setting / country**: Liverpoool; UK<br><br>**Aim of study**: To explore views about cycling among community groups living near the Loop Line. | **Number and characteristics of participants**:<br><br>23 Young people, single mothers and older people.<br><br>6 groups:<br>1. 2 boys aged 11-12<br>2. 2 boys and 1 girl aged 11-12 | **Intervention aims and content if applicable**:<br>Proposed PCT-led Cycling Programme<br><br>**Data collection methods**:<br>Focus Groups:<br>• Views of physical activity and health<br>• Perceptions of cycling and reasons for cycling / not cycling<br>• Views on local environment for cycling, specially the Loop | **Main Themes relevant to research question**:<br>Mainly positive views about physical activity and its role in their life.<br><br>*Motivations*<br>• Older people recalled happy times cycling – associated with joy, freedom, youth.<br>• Practical aspects included transport, and getting to places more quickly, enjoying fresh air, losing weight.<br>• For young people, image was crucial. For boys, it was only acceptable if fun or cool. For young people, health benefits or environment not linked so | **Limitations identified by author**: Small self-selected sample.<br>More may have been learned from interviews rather than group discussions.<br><br>**Evidence gaps and/or recommendations for future research**: |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| **Study design**:<br>Focus Groups<br><br>**Funding**:<br>NR<br><br>**Quality**: ++ | 3. 4 girls aged 15<br>4. 4 women aged 25-35<br>5. 2 men and 3 women aged 50+<br>6. 3 men and 2 women aged 50+<br><br>Nearly all had tried cycling, usually when young but stopped for a range of reasons. Cycling for most was a small part of their lives as well as their friends' lives.<br>One man classed himself as a keen cyclist, having competed in his youth. He enjoyed the speed and cycled 30-40 miles per day.<br>One young mother continued to cycle, having never been without a bike. | Line<br>• Views of proposed cycling programme<br><br>**Data Analysis**:<br>Thematic analysis<br>Coding agreed between researchers | much with cycling.<br><br><u>Barriers to cycling</u><br>*Give us a go!*<br>• Fear of having bike stolen was linked to living in North Liverpool (mainly taken in the street by someone known to the owner).<br>*Image*<br>• Complex issues, especially for young people, about the image of cycling.<br>• For school children, not seen as appropriate for either girls or boys.<br>• Even if they owned a bike they would not cycle to school as they would get laughed at, and they knew no-one other than teachers who did so.<br><br>*Gender differences*<br>• Girls did not cycle (but thought it was acceptable in young males). Practical reasons – clothing, safety and facilities. However this seemed to mask the notion that it just wasn't the 'done' thing.<br><br>*Fear*<br>• Fear of traffic, and of being knocked off the bike, was a concern. Cycle lanes were OK, but then you come to a roundabout…<br>• Fear of crime was more of a barrier. Going out in the local area was seen as threatening because of anti-social behaviour.<br><br><u>Cycling on the Loop Line</u><br>*Fear of the unknown*<br>• To an outsider the line appeared to offer opportunities for traffic free walking and cycling. However for locals, it was different.<br>• The line as a popular place for young people to hang out, especially under bridges. This was | Need to carry out research with larger variety of community groups.<br><br>**Applicability**<br>UK study, the population are not particularly regular walkers or cyclists but their views may reflect similar ones in urban areas. Trails will vary in characteristic. |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| | | | reported as intimidating for those walking or cycling by, especially at night.<br>• Some would put up with the problems, and knew which areas to avoid, though where the line crosses the road was seen a problem area where rocks are thrown at vehicles.<br><br>*Positive views*<br>• Only a few had used the line regularly, and most of these were more positive, particularly about use during the day, when families are out at weekends.<br>• A good feature was that the line stretched out into the countryside; some of the group members were surprised when they realised that the countryside was so close to home.<br>• Line was attractive that at first but had declined. The problem was a spiral – less people using the trail meant youths could take over more, and less people want to use the trail.<br>• Suggestions for improvement included cutting down bushes, to help visibility and security.<br>• Strong sense that community needed to reclaim the line, that they had lost ownership.<br>• Security patrols such as Sustrans rangers, community service officers, police officers or volunteers were suggested.<br><br>*Led rides*<br>• For young people the important aim would be to have a laugh and be in a group of friends. This would encourage girls to cycle.<br>• For boys it was important that they used appropriate bikes and no helmets.<br>• Older people were concerned about safety from potential trouble, and that the ride was within their capabilities.<br>• Mothers were the most positive as long as all ages | |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| | | | were included so that they could bring their children. | |
| **Author**: Copleton<br><br>**Year**: 2010<br><br>**Setting / country**: US<br><br>**Aim of study**: To explore the rejection of pedometer technology among older adult walkers<br><br>**Study design**: Participant observation and interviews<br><br>**Funding**: NR<br>**Quality**: + | **Number of participants**: 30 adults (8-15 walkers at each event; core of 5 regulars – 4 women and one man)<br><br>50-79 years of age<br><br>Majority women (only two men attended once each other than the 'regular' male). | **Intervention aims and content if applicable**:<br>Sponsored walking group (the 'Walkie Talkies'), targeting older adults at a community hospital.<br>Meetings Thursday mornings.<br>Original aims to encourage personal fitness and reach goals, charting progress with pedometer.<br><br>**Data collection methods**:<br>Observation of weekly walks (14 observations of approximately 90 minutes each).<br>Interviews<br><br>Key informant interviews with four 'regulars' to explore social and personal meanings attached to walking with the group.<br><br>Interviews with walking club co-ordinator and Wellness Director to determine information about the club, it's history and overall importance among wellness initiatives.<br><br>**Data Analysis**:<br>NR | **Main Themes relevant to research question**:<br>Significant changes at the club – change in emphasis away from fitness goals.<br>Only the club co-ordinator continued to wear a pedometer; resistance bands were only distributed to new members.<br>*Format:*<br>Walkers assemble at 10.00 outside hospital. Greetings exchanged, conversations begin.<br>Stretches to warm up. Announcements and introductions.<br>Walking the perimeter of the buildings on pavements and car-parks. Walking at own pace, maintaining lively conversations.<br>Reassemble at 11.00 for cool-down (more conversation, stretching and working with resistance bands – legs then arms).<br>'Story-time', the co-ordinator shares a funny joke or story while leading balancing exercises. Walkers disperse after this session.<br><br>Pedometers, step-counts and goal-setting were dropped for this structure because they "*didn't make any difference and seemed to turn people off*". The co-ordinator did not think that once a week meetings were enough to make sense of step counting.<br><br>*Walking for health and camaraderie*<br>Most joined for health reasons, age-specific need for regular exercise. Modest expectations did not include fitness goals, so pedometer use was unlikely.<br>Primary reason now was the social aspect of the group ('camaraderie'), even though they had other social outlets.<br>Conversation facilitated camaraderie while competition detracted from it.<br><br>*The importance of conversation*<br>Conversation was possible the most important component. | **Limitations identified by author**: Small qualitative study.<br><br>**Evidence gaps and/or recommendations for future research**: NR<br><br>**Applicability:**<br>US based study; may be applicable to interventions that recruit older adults in UK. |

| Study details | Population and setting | Methods | Findings | Notes |
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| | | | More fun to walk as have someone to talk with, it introduced an element of fun, helped the time pass and gave walkers something to focus on other than exercise.<br><br>Sociability was facilitated by walking in pairs and talking. Pairs formed from the initial warm up session, or regular partners were sought out. Spontaneous pairing increased variety as well as broadening social ties. Conversations provided a rationale for returning the following week, to keep up to date with activities of members. This reinforced social cohesion.<br><br>Knowing what others were doing helped a feeling of connectedness and facilitated adherence.<br>Topics of conversation included knitting, cooking, TV, holidays, sport and community events – all safe topics, unlikely to offend. Politics was less discussed for this reason.<br><br>Participants highlighted the jovial nature of the group. For example, one woman takes longer to roll her resistance band as she is so meticulous about it, and this makes her late to start the next exercise, which is a standing joke among the group and the participant. Joking was interwoven with the activities.<br><br>*Competition and hierarchy as threats to sociability*<br>Walkers emphasised the non-competitive and non-hierarchical nature of the group, which had implications for pedometer use. Counting steps, walking faster and greater distances put pressure on members unnecessarily, challenged norms and values by creating hierarchies. Having no demands was one of the attractions of the group; it was acceptable to stop and have a rest.<br><br>Many walkers perceived aerobic classes as inherently competitive and distinct from their own moral economy. Only one member, the regular male, was also a gym member. Women were aware of how they might be judged negatively | |

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| | | | at gyms in relation to their abilities, physique and age. The age restriction of Walkie-Talkies limited the extent to which women would be negatively judged compared to younger people.<br><br>The club therefore provides older women with a safe environment unfettered by ageist assumptions of worth or values that equate youth with goodness and beauty.<br>There was a strong emphasis on not overdoing it and not competing – only doing what your body can do.<br><br>*The moral economy and the failure to domesticate pedometers.*<br>Emphasis on sociability was likely the main reason for the rejection of pedometers but the continued use of resistance bands. Women in particular were uninterested in any activity that might introduce disharmony among the group.<br>Not only would pedometer use violate group norms, it would also conflict with identity construction – they are not only used, they are worn – an intimate and social act that contributes to one's symbolic presentation of self. To wear might signify a concern with 'out-stepping' the other members, so that non-use was more consistent with the moral economy of the group.<br>The male club member occasionally wore his pedometer as he was curious about the steps he was taking in various activities. The data was inconsequential; he never wore his pedometer on group walks.<br>Non-use cannot be simply explained by a phobia of higher technology as club members used technology in a variety of ways at home. | |
| **Author**: Darker<br><br>**Year**: 2007<br><br>**Setting / country**: UK | **Number and characteristics of participants**:<br>5 females<br>5 males<br>Age 25-35 (mean 28.9) years. | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>Interviews (approx 45 mins) :<br>Recall an episode of walking that was | **Main Themes relevant to research question**:<br>*Understanding of exercise*<br>Some participants did not value walking as a form of exercise. John described himself as sedentary even though he walks more than recommended 30 minutes per day.<br>Steve stated that 'proper exercise' has the purpose of calorific balancing and improving the cardiovascular system. | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations** |

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| **Aim of study**: To provide an account of participants' experiences of walking.<br><br>**Study design**: Interviews<br><br>**Funding**: NR<br><br>**Quality**: ++ | Snowball sample from general public. | salient.<br>• What was enjoyable, what was disliked.<br>• Reasons and motives for walking.<br>• Where walking takes place and who with.<br><br>**Data Analysis**:<br><br>Interpretative Phenomenological Analysis (IPA). | Walking was too low intensity to benefit. However, walking after a meal aids digestion.<br>Alex sees walking as 'load bearing' which can be beneficial since it burns energy and relieves stress. Fast walking differs from slow as it pushes the heart and lungs.<br>So comparison of walking and 'exercise' as cardiovascular.<br><br>*Functionality of walking for transport*<br>For Caroline, walking is a way of getting somewhere<br>Environmental constraints may prohibit walking<br>However, Steve cycles rather than walking as it cuts down on time. He does walk to see sights with friends or family.<br>For Caroline 'proper' walking takes place outside She cycled to the gym and then felt she had already had the exercise and would rather be outdoors.<br><br>*Contextual element of social support / companionship*<br>Walking may influence well-being though social benefits.<br>Zoe recalls a100 mile walk on Dartmoor as a training exercise. Though it was mid-winter and in the snow, Zoe looked back at the experience as fun because there was a large group spurring each other on.<br>Matthew usually walks alone for functional purposes (to work). For a country walk he would prefer company to share the experiences. He uses music for company, as well as to drown out noise from construction sites, on the way to work. This helps him to think more.<br>Tina believes that living in the city facilitates a different type of walking.<br><br>*Psychological benefits*<br>Steve enjoys the slower pace of walking so that he can appreciate the scenery and take a mental break. Peter uses walking as a way of reflecting on the day or solving a problem.<br>Tina also allows her mind to wander when walking in a way that she cannot do when thinking about work, or other things, or watching TV (which see sees as a 'bad' thing to | **for future research**: Establish whether the concerns and issues identified in this study apply more generally to the public.<br><br>**Applicability**<br>Applicable to adults in the UK as most of these experiences are available in urban / rural areas here. |

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| | | | do).<br><br>*Conflicts towards walking*<br>Perceived lack of time was a recurring theme.<br>Alex believes that walking is an inefficient form of transport in a busy life though will dedicate 10-15 minutes getting from A-B.<br>Samantha states that anything up to half an hour would be OK. One walk took 45 minutes and that "*was a lot".*<br>However, a three hour walk up Snowdon was seen as worthwhile because it was a challenge, pleasurable, with amazing views (walking back from Edgbaston did not have the same impact).<br>For Peter time is the deciding factor but is probably due to his own poor time management (he lies in and therefore doesn't allow time to walk to work). | |
| **Author**: Davis<br>Two papers reporting same results<br><br>**Year**: 1996 / 2001<br><br>**Setting / country**: Birmingham; UK<br><br>**Aim of study**: To understand children's and young people's perceptions of risk and patterns of decision making on transport.<br><br>**Study design**: Focus Groups | **Number and characteristics of participants**:<br>4 schools, one primary and one secondary in inner suburban areas, one primary and one secondary in outer suburbs.<br><br>All schools in areas with larger than average heads per household and lower occupational classes.<br><br>492 children aged 9-11 years and 13-14 years | **Intervention aims and content if applicable**:<br>NR<br><br>**Data collection methods**:<br>Focus Groups (6-8 children from each area) lasting approximately 50 minutes.<br>Questions based on open-ended responses in previous questionnaire.<br><br>**Data Analysis**:<br>NR | **Main Themes relevant to research question**:<br>Younger age group reported less freedom of movement.<br>Teenage girls in particular highlighted restrictions to independent mobility. These were related to legitimate fears of parents but also stereotyping of girls by male peers and adults.<br>Across all schools 43% reported they didn't feel safe in their area, that traffic was bad, and it was dangerous crossing roads.<br><br>*9-11 year olds*<br>Cycle use was restricted by danger from traffic, and cycle theft which was a concern to both parents and children.<br>Despite 90% cycle ownership in most classes, and a strong desire to cycle, hardly any children cycled to school. Most walked with parents, siblings and friends and a minority were driven.<br>Cycling was restricted to 'round the block on the pavement'.<br>One child reported boredom if cycling alone.<br>All were aware of health promotion messages about physical activity and recognised the restraints on being healthy.<br>Seeing parents 'being lazy' by using the car for short | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>See also Jones *et al* 2000 on same study focusing on fear as background.<br><br>**Applicability**<br>UK study so may be generalisable to other schools and children of these ages. There may be differences in views and behaviour |

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| **Funding**:<br>NR<br><br>**Quality**: + | | | distances was an influence. They recognised the convenience and also the disadvantages of car use.<br><br>*13-14 year olds*<br>Teenage girls reported restrictions and curfews. Lack of things to do in the evening was an issue for both boys and girls. There were reports of not being allowed out because of dangerous roads and parks. The girls saw cycling as childish, risky and not stylish "*you would look a prat riding up and down on a bike at our age"*<br>More acceptable was walking. 44% in one school saw walking as the best way to travel locally. | in more affluent areas, or in areas where cycling is more popular. |
| **Author**: Duncan<br><br>**Year**: 1995<br><br>**Setting / country**: One mall; West Virginia; US<br><br>**Aim of study**: To synthesise meanings and motivations for mall walking among older adults.<br><br>**Study design**: Participant observation, personal conversations and interviews.<br><br>**Funding**:<br>NR | **Number and characteristics of participants**:<br>Elderly (>60 years) mall walkers who walk at least 30 minutes 3 times per week.<br>35-52 observed as they walked on any given day**.**<br>14 interviewees, all White, five women and nine men, aged 61-81.<br>Telephone interviewees: mall manager, past officers of walking club. | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>Participant observation one hour (random times between 07.30 and 10.00) three days per week over four months.<br>Interviews with walkers (60-75 mins).<br>Field notes and diary.<br>Telephone interviews with mall manager and walking club officers.<br><br>**Data Analysis**:<br>Grounded Theory<br>Interactionist theory.<br>Core categories identified. | **Main Themes relevant to research question**:<br>*Reasons for initiating mall walking*<br>Expert directed (11 in response to physician directions)<br>Self-directed (3 had personal goals to maintain health and independence)<br>Other directed (All but 2 had invites from family, and less often, friends).<br>Continued participation dependant on:<br>• Meaningful post-retirement work (all but one had history of paid employment outside home. Mall walking created to provide walking routines , activities and social contacts)<br>• Need for socialisation (Fewer opportunities to make new friends with growing age, therefore effort needed to meet with people and make social contacts. 7 walked with spouses though most couples did not walk together, preferring same sex companion or groups. New acquaintances made while walking. Pace was important and a partner needed to walk at a compatible pace. Most pace partners had not known each other before mall walking together).<br>• A sense of belonging (Community created with a shared interest in mall walking. Considered to be part of a special group with shared customs, rituals | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>For interventions in other settings, personal mastery might be encouraged using rewards and reminding participants of the social benefits.<br><br>**Applicability**<br>Malls are more common in the US, but are increasing in popularity in the UK. However many are out of town; it is not clear how relevant this would be to |

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| **Quality**: ++ | | | and beliefs.<br>• Having coffee together after the walk might be one custom. Older walkers took action to exert social control over conduct of others during early morning hours, such as walking in the same direction and not place belongings in another group's spot. Shared belief of self-discipline set them apart from inactive older people. This mindset provided a shared bond.<br>• The mall as a safe environment (All but one [male] reported sense of fear and vulnerability. Though they would enjoy walking outside, they felt safe and sheltered in the mall and this outweighed the benefits of being outside. No reason to suspect this was an area of high crime).<br>Over ¾ of the sample reported that they had become a couch potato, experienced boredom or depression or didn't know what to do following retirement. None had mall walked previous to retirement. This group defined themselves as healthy and resisted social stereotypes to build new work-role substitutes and a new community.<br>Malls provide an inexpensive environment in which to engage in physical activity. However for this sample walking is also regarded as work, with roles, rituals and meaning. | elderly people that live some distance from the mall. Theoretical constructs are generalisable and the work metaphor could be used to develop meaningful interventions for post-retirement populations. |
| **Author**: Dunn<br><br>**Year**: 2008<br><br>**Setting / country**: US<br><br>**Aim of study**: To explore how to maximise a physical activity prescription (walking | **Number and characteristics of participants**:<br>14 post-menopausal African American women. Age 45-66 years.<br><br>All overweight or obese. Median BMI = 52.5 kg / $m^2$ (range 26-52)<br><br>Married = 10<br>Divorced = 3 | **Intervention aims and content if applicable**:<br>Walking intervention (described in Keller *et al* 2004)<br><br>**Data collection methods**:<br>3 Focus Groups (60-90 minutes duration):<br>Factors that encourage or inhibit adherence to the intervention over a 9 month period.<br>• Personal experiences as participants | **Main Themes relevant to research question**:<br>Generally, the decision to participate was accompanied by good hopes, motivation and commitment. However, for many maintaining participation was difficult.<br><br>*Women who stopped walking*<br>Though they knew they needed to walk, women could not manage everything going on in their lives. Simple barriers such as weather and changed schedules were surmountable, with strategies being formed to continue walking. Those who stopped walking could not adopt these strategies. Reasons for not walking:<br>• Multiple situational factors such as family demands, | **Limitations identified by author**: NR<br><br>**Evidence gaps and/or recommendations for future research**: To examine the relationship between personal facilitators, barriers and social relationships. |

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| intervention).<br><br>**Study design**: Focus Groups<br><br>**Funding**: NR<br><br>**Quality**: + | Widowed = 1 | • Perceived motivators to participation<br>• Strategies for maintaining a walking routine<br>• Ideas regarding benefits of walking<br><br>**Data Analysis**:<br><br>Reading, coding and second level coding.<br><br>Coding validated by doctoral students, and statements confirmed by contacting participants. | lack of time (work schedules for example), lack of support to continue<br>• Personal reasons such as devaluing walking and giving over control of behaviour to God<br>• Health problems such as thyroid, arthritis<br>Regular walking required setting a routine, but non-walkers did not have a personal objective and thought motivation would come from other participants.<br><br>*Women who continued walking*<br>These women claimed physical activity was 'challenging and refreshing'. They prioritised walking and helped others. The largest motivator was having someone who was either interested in their walking or walked with them.<br><br>Walking was interjected into life ('*just like cooking dinner*…'). Focusing on the self was difficult shift for the women.<br><br>Benefits were experienced such as 'better health'. One woman's husband decided to start walking with her (..*'we had a great time walking together*'.)<br>Another woman described how walking changed the way she cooked – more healthy. Some women described feeling meditative, and taking the time to get close with God. It was also associated with stress relief, as well as responsiveness to family members.<br><br>Positive results were also noticed in relation to body size and shape, with one reporting that she had lost 12lbs. Even if no weight was lost, body shapes were altered.<br><br>Many women were able to weave their focus on walking into family life so that everyone benefitted. Those who could not use reciprocity saw walking as superfluous and selfish. | **Applicability**<br>Findings may be specific to this age and ethnic group, in particular, aspects pertaining to religion. However, motivational aspects may be common to other groups. |
| **Author**: Gaterslaben | **Number of participants**: Members of the University of Surrey (hilly | **Intervention aims and content if applicable:**<br>NA | **Outcomes**:<br>Pre-contemplative stage (never used a bicycle to travel to work and never considered using one) n=68 | **Limitations identified by author**: NR |

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| **Year**: 2007<br><br>**Setting / country**: UK<br><br>**Aim of study**: To examine who cycles and why, to determine how people can be best persuaded to cycle more.<br><br>**Study design**: Survey and interviews<br><br>**Funding**:<br><br>**Quality**: + | terrain).<br>389 questionnaires completed (28% response).<br><br>Academic population so not representative of general public. In addition the university introduced a Green Travel Plan.<br><br>Only those respondents living less than 5 miles from work were included in the analysis.<br><br>Final n=178 | **Data collection methods**: Questionnaire (13 items) Interviews<br><br>**Data Analysis**: Transactional model of behaviour change used to examine attitudes and perceptions.<br><br>All respondents grouped into one of the 5 stages of change. | Contemplative stage (never used a bicycle to travel to work but had considered using one) n=42<br>Preparedness for action stage (rarely or sometimes used a bicycle to travel to work and considered using one) n=28<br>Action stage (often used a bicycle to travel to work) n=15<br>Maintenance stage (always used a bicycle to travel to work) n=25<br><br>**Main Themes relevant to research question**:<br>Regular cyclists were most often men.<br>• Those who had never contemplated cycling were more often women, and were more likely to walk or drive, and perceived more personal barriers to cycling.<br>• Those in contemplative stage perceived more structural; barriers and were positive about cycling in terms of the environment.<br>• Those who were prepared had similar perceptions but were less concerned about the risks.<br>• Those who cycled occasionally had a positive attitude but would like to see more cycle lanes.<br>• Those who were ready to cycle were most likely to walk.<br>• Regular cyclists had the most positive attitude but were more likely to state that parking and changing facilities need to be improved.<br>Use of public transport was low, especially among cyclists. Some cyclists included families suggesting that having a family was not necessarily a barrier.<br><br>*How to move respondents closer to action*<br>• More safe cycling facilities<br>• Better weather, flatter terrain<br>• Shorter distance#<br><br>*Specific plans for action(from Prochaska et al)*<br>• Feedback | **Evidence gaps and/or recommendations for future research**: NR<br><br>**Applicability:** May be applicable to other groups in UK but need to take into account this sample is from an academic background. |

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| | | | • Social support and reinforcement<br><br>*Diaries from 22 new cyclists from the sample*<br>Over two weeks most completed the diary for 8 days (16 journeys). 20% of journeys were made using other modes. Of the cycling journeys, respondents reported enjoyment, with 95% stating the experience had been pleasant. This did not change over time or between journeys to and from work. Pleasant experiences were associated with the cycling activity, sense of achievement uphill, the thrill of cycling at speed and being in the fresh air.<br><br>Negative experiences were associated with bad weather or darkness, feeling tired, effort cycling up hills and saddle soreness. Traffic related problems were mentioned, though these declined with time, as did weather related issues. No changes were found over time in physical activity issues.<br><br>*Interviews from 22 new cyclists from the sample*<br>The main reasons stated for wanting to cycle were convenience (40%), getting fit (37%) and the environment (37%). Aspects of fitness, being outside and having fun were mentioned less often after the cycling period than before. Aspects related to flexibility were mentioned more often. Inconveniences were mentioned slightly more and safety issues slightly less following the two weeks.<br>13 stated they had enjoyed the experience, though 7 had not always, and one had not enjoyed the experience as it felt dangerous. Most enjoyed it more than they had expected though two had enjoyed it less. Some found it stressful in terms of organisation and carrying belongings. 68% said they would continue to cycle. | |
| **Author**: Gilson<br><br>**Year**: 2008<br><br>**Setting / country**: UK | **Number and characteristics of participants**:<br>64 (58 females)<br>Mean Age: 41.4 (SD 10.4) years. | **Intervention aims and content if applicable**:<br>10-week workplace based walking intervention. Control = normal behaviour.<br>2 treatment groups: | **Main Themes relevant to research question**:<br>*Health and Wellbeing*<br>Both interventions encouraged heightened awareness of own health. Mood was enhanced, energy increased and coping with sad feelings enhanced.<br>Feeling that workplace was investing in their well-being | **Limitations identified by author**:<br>Study favoured women. Sample size and duration. |

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| **Aim of study**: To explore the experiences of university employee recruited to a 10-week RCT.<br><br>**Study design**: Interviews<br><br>**Funding**: NR<br><br>**Quality**: ++ | Walking Routes n=21<br>Walking while working n=21<br>Control n=22<br><br>Interviews with subset n=15 (13 female) intervention participants, 7 from walking routes; 8 from walking while working. | *Walking Routes*: prescribed walks around campus for at least 15 minutes (continuous brisk walking).<br>*Walking while working:* Accumulation of step counts throughout the working day. Encouragement to walk to see colleagues rather than send e-mails.<br><br>**Data collection methods**:<br>Interviews<br>Field notes<br><br>**Data Analysis**:<br>Coding to identify key themes and subthemes. | (pedometers and weekly e-mail motivational messages). Walking while working provided variety in working day.<br><br>*Work Performance*<br>Walking while working encouraged sense of autonomy, better mental focus, improved output, better communication, greater sense of community and collective responsibility, resolution of interpersonal tensions.<br><br>*Barriers*<br>Time pressures – busy working day; large volume of desk work 'my free spaces (for walking) became eroded…'.<br><br>*Accepted practice and management culture*<br>Difficult to engage in behaviour not considered normal by peers. Difficulties for junior admin staff around perceptions of management. Academic staff had less difficulty integrating into working day. | **Evidence gaps and/or recommendations for future research**: Need to explore gender implications in this context.<br><br>**Applicability**<br>UK based so applicable in workplace settings, though specific to academic / desk work. Could be transferred to other work settings but need to take into account the type of work and the culture of the organisation. |
| **Author**: Granville<br><br>**Year**: 2001<br><br>**Setting / country**: UK (Edinburgh and Aberdeen)<br><br>**Aim of study**: To explore attitudes of drivers and cyclists toward each other in an urban context.<br><br>**Study design**: | **Number of participants**:<br>Three locations within each city<br>42 group and individual interviews:<br>Exclusive car drivers<br>Car drivers who cycle<br>Taxi, minicab, bus and coach drivers<br>Other commercial drivers<br>Motorcyclists<br>Cyclists during busy periods<br>Cyclists during less busy periods<br><br>Pedestrians and | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>Group, paired and triad interviews:<br>• the degree to which a particular road user can be considered to be 'environmentally friendly'<br>• the degree of safety they are perceived to offer both to themselves and to other road users<br><br>**Data Analysis**: | **Main Themes relevant to research question**:<br>*Perceived image of road users*<br>Cyclists perceived to be the most environmentally friendly, though their perceived levels of safety fluctuate. One group, 'responsible professional cyclists' considered to be very concerned with safety; they understand how to interact with other road users, use appropriate equipment (e.g. helmets, lights) and follow correct and polite habits so that they nor others are endangered.<br><br>The other extreme are courier cyclists, perceived as a danger to themselves and other road users due to poor habits that infringe on other users and create dangerous situations (e.g. weaving in and out of traffic; ignoring other users).<br><br>Between these extremes are other cyclists, whose | **Limitations identified by author**: NR<br><br>**Evidence gaps and/or recommendations for future research**: NR |

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| Meetings with council staff.<br>Focus groups and paired / triad interviews with road users<br><br>**Funding**:<br>Scottish Executive<br><br>**Quality**: + | recreational cyclists excluded | NR | occasional bad behaviour tends to tarnish perceptions of all cyclists (e.g. cycling through a red light).<br><br>*Prioritising road users*<br>Cyclists were not generally perceived to deserve priority (in contrast to buses that were keeping cars off the road and lorries that were performing important work). They were seen as environmentally friendly but there were factors that had a negative impact on their perceived priority (lack of regard for other users, failure to adhere to safety guidelines, poor behaviour, not paying road tax, not being able to keep up with other traffic and not showing courtesy to others) despite many groups acknowledging the vulnerability of the cyclist.<br><br>*Attitudes of road users*<br>Cyclists regarded themselves as equal to other users and cited advantages of cycling for themselves (fast, cost effective, health benefits), other road users (do not cause congestion, take up little space) and the public generally (do not create pollution).<br><br>These attitudes were reinforced by those of motorcyclists who held similar views and expressed similarity of experience (better perception of what is happening around you; always looking out for traffic). Other users acknowledged the health and environmental effects but were critical of cyclists who did not use lights after dark and do not make use of cycle lanes. Weaving in and out of traffic, violating signals and cycling on the pavement were also cited as exasperating behaviours. Concerns were also due to the vulnerability of cyclists and a desire to avoid unnecessary accidents ("*I hate them; I am terrified I will hit one, so I give them the widest berth ever*…").<br>Many cyclists accepted the criticism and the negative perceptions that have been created by irresponsible cyclists. Most admitted to one or more instances of such behaviour themselves. One cyclist used pavements to avoid traffic, had | |

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| | | | been stopped by police, but continued to cycle on the pavements.<br><br>Many drivers considered cyclists as 'their own worst enemy' – they do nothing to improve perceptions of cyclists. There was concern that cyclists lack road sense. Students were particularly criticised (less road-worthy equipment, lack of safety equipment, lack of familiarity with road network and normal driving conventions). Student areas were actively avoided by some non-cycling participants. There was comparison between having to wear seatbelts, yet cyclists may fail to wear helmets and reflective clothing ("*if they get knocked off their bike, their head hits the ground…*").<br>Differing speeds of cycles and cars led some to imply that they should not be sharing the same space (professional cyclists were able to keep up a pace despite conditions). In addition, the non-contribution to road upkeep by tax was another reason for de-prioritising cyclists on the road. It was argued that contributing would raise the profile of the cyclist in terms of road rights. Non-cyclists tended to view cyclists as a minority group, commanding too much in the way of resources and benefiting from additional provision.<br>There was acknowledgement that police were unwilling to regulate poor cycling behaviour, mainly because cycles do not need to be registered and if they were this would not be cost-effective. Also, other demands of road regulation take precedence over efforts towards cyclists.<br><br>*Driver-cyclists*<br>Experience of other types of road use than driving tended to increase empathy, so that driver-cyclists had a lot of empathy and commonality with cyclists. They showed a greater degree of awareness of, and tolerance toward cyclists. Cyclists could make this differentiation when they were cycling because of the way the drivers interacted with cyclists.<br><br>Conflict points are as above and where cycling provision | |

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| | | | ends and cyclists move into shared space as drivers.<br>Ideally, cyclists would like cycle-only lanes along all major routes as well as more minor routes. There was acknowledgement that the provision that has been made may have increased the use of cycles, though not enough (and often confusing), and that a cultural change is required to produce greater acceptance of cyclists by other road users.<br><br>*Attitudes toward road provision for cyclists*<br>Road markings – important, but often inconsistent and incomplete, leading drivers to ignore them. Signs were often lacking in visibility and there wasn't enough time to read them.<br><br>There were conflicts of pace and space between bus drivers and cyclists in the bus lanes with buses having to overtake cyclists and vice versa. Parking in cycle lanes made them unusable. Lanes also became covered by leaves, debris, litter, diesel oil and had potholes and other defects that made the surface dangerous.<br>Roundabouts were particularly hazardous and often cyclists walked around them rather than cycling. Advance stop lines were an issue and gave drivers encouragement to 'race' with the cyclist.<br><br>Acknowledgement that training would benefit most cyclists and bicycles should be tested for roadworthiness. There were comments that the Highway Code should be consulted more, so that all road users knew the rules, not just prior to a driving test. Comparisons with other European countries, where cycling awareness and cycling is more prevalent.<br>Sources of potential information suggested were TV and radio campaigns, posters on buses. Mailshots were not popular unless it was additional to AA / RAC information, car tax reminders or in the form of a booklet.<br>Other suggestions were compulsory helmet wearing, and compulsory cycling proficiency training. | |

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| **Author**: Granville<br><br>**Year**: 2002<br><br>**Setting / country**: UK<br><br>**Aim of study**: To explore reasons why parents choose to drive their children to school and the relative importance of age and geographical context.<br><br>**Study design**: Group discussions<br><br>**Funding**: Scottish School Travel Advisory Group<br><br>**Quality**: + | **Number of participants**: 3 groups with parents of P1-P4 pupils who usually 'drop off' their children at school.<br><br>3 groups with parents of P5-P7 pupils who usually 'drop off' their children at school.<br><br>3 groups with parents of S1-S4 pupils who usually 'drop off' their children at school.<br><br>3 groups with S1-S4 pupils whose parents were taking part in the above groups.<br><br>Mix of gender.<br>Mix of urban, suburban and small town areas. | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>Group discussions (total of 12)<br><br>**Data Analysis**:<br>NR | **Main Themes relevant to research question**:<br>*Use of walking*<br>For most parents, walking was the most likely alternative to driving. Preference for walking reflected the unattractiveness of alternatives such as school / public bus or cycling than a positive attitude toward walking.<br>Walking was only considered an alternative in certain circumstances such as fine weather, when the parent is not at work, or when the car breaks down and there is no time to organise an alternative mode.<br>Walking was limited by time pressures, though walking home from school was a common choice for older children as they can walk with friends. For younger children walking was in exceptional cases, as they needed to be accompanied.<br><br>*Benefits of walking*<br>Though parents tended to focus on the disadvantages of walking, they acknowledged the health benefits of walking, as it provides exercise. However children were reported to exercise in other more beneficial ways through school and after school activities.<br>A few parents acknowledged the time that walking with their children allowed them together. Others argued that the same quality time could be provided during a car journey, though children did not value this so much. Older children valued time with friends more whether on foot or by bus. Driving was perceived to be distracting for parents as they needed to concentrate on the road.<br><br>*Disadvantages of walking*<br>Walking was not feasible in some situations. The ability to choose a school for children can result in distances being travelled that rule out the choice of walking as a mode of transport. Younger children may be less capable of walking moderate distances. In addition, children need to take equipment to school such as those used for sports or studying which can become damaged if children find bags difficult to carry. Even lockers are not feasible for all items, | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability:**<br>This study assesses Scottish parents of schoolchildren of specific ages. May be applicable to other UK parents with children of similar ages.. |

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| | | | some of which may be valuable.<br>Children could be tired at the end of the day.<br>School rules and regulations can conflict with aim of encouraging non-car travel, such as having to have a known adult waiting for children outside the school.<br>Parents with more than one child at different schools may find it impractical to deliver all children on time.<br>Having different start times at the same school has the same effect. Traffic volumes at start times were also a disincentive to walking.<br>Safety was another concern – stranger danger (despite being rare – one event is one too many) and perceived inability of children to deal with traffic volumes. The fear is stronger in regard to younger children, but remains to an extent as children become older.<br>Children perceived to be vulnerable to inappropriate behaviours from others, though these remain with other modes of public travel. There were also areas that were not considered safe to travel such as underpasses and woodlands. Intimidation from other children was rare and more likely to occur for older children.<br>Lack of road sense (and confidence) was another factor against walking and cycling. Discouraging walking limits children's ability to develop confidence and experience.<br>The competence of other road users was also questioned and this was felt to be a potential danger.<br>Children also discussed risks, though felt themselves capable of dealing with situations that might arise.<br>Being driven was also preferred due to convenience and laziness. Lack of visibility on dark mornings and poor lighting were also cited. Narrow pavements, congested urban areas. The weather was also an issue as there was no facility at school to dry clothing.<br><br>*Suggestions to encourage walking*<br>• Pedestrian training<br>• Escort schemes (e.g. walking bus) though these were seen as childish by older children, and they | |

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| | | | require children to live close by to each other.<br>• Traffic calming<br>• Wider pavements, more crossings, traffic free zones.<br>• Schools providing more facilities for storage and drying clothes.<br>*Cycling*<br>Many parents and children did not consider cycling a viable option despite the health benefits, cost savings and time saving.<br>*Disadvantages*<br>Fears of children cycling in congested environments; lack of positive infrastructure (cycling lanes not perceived as safe enough – lack of separation between lane and main carriageway).<br>Bad weather, inadequate street lighting, lack of consideration by other road users. The volume and speed of other traffic was also a concern, opening car doors and inappropriate driving behaviour.<br>Stranger danger was more concern for parents of younger children. Carrying bags and having to have the 'coolest' cycling equipment were concerns for older children and their parents.<br>*Methods of encouraging cycling*<br>Traffic calming – parents not convinced of the positive impact even for [pedestrians, and less so for cyclists. Could even increase danger through drivers swerving to avoid bumps. 20mph zones were viewed more favourably in regard to cycling if adhered to.<br>*Cycling proficiency*<br>Timing suggested to parents that younger children ought not to be cycling on roads. if younger children were expected to cycle to school, the age for training should be brought forward. Support for including practical elements.<br>Reports of young children cycling but without the knowledge (e.g. on wrong side of road).<br>*Cycling Facilities* | |

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| | | | Provision, for example storage, may encourage cycling.<br>*Cycle paths and dedicated lanes*<br>Main preference from parents was for dedicated lanes rather than part of the carriageway. Netherlands as a good example of cycle route alternatives, where motor vehicles cannot access cycle paths.<br>*School based facilities*<br>Some felt that facilities for drying clothes etc. would have little impact compared to provision of safe storage for cycles.<br>*Positive encouragement*<br>Cycling seen to suffer from general lack of awareness as an option. Incorporating cycling as a healthy exercise within the proficiency training.<br>*Message style*<br>Positive reinforcement<br>Simple clear portrayals of the benefits (not focussing on negatives) and acquired skills.<br>Pollution – worse when riding in car.<br>Children can bring messages home to parents from their school initiatives.<br>Involvement in the public when making decisions – may have useful suggestions.<br>Being part of bigger picture to reduce car travel. Local change will eventually bring about cultural change. | |
| **Author**:<br>Halden Consultancy<br><br>**Year**: 2003<br><br>**Setting / country**: Scotland; UK<br><br>**Aim of study**: To examine the influences of various transport objectives on | **Number of participants**:<br><br>34 stakeholders<br><br>Children and parents from 12 schools<br><br>Survey in 4 schools Children n=367 (60% response); parents n=82 (approx. 14%). | **Intervention aims and content if applicable:**<br>NA<br><br>**Data collection methods**:<br>Discussions with stakeholders about their views on children's attitudes toward transport and sustainable development.<br><br>Discussion groups with children.<br><br>*Variations:*<br>In one school personal construct | **Main Themes relevant to research question**:<br>*Interviews with stakeholders*<br>General feeling that children are more aware now than in the past about sustainable development. Despite this there were some factors that worked against it, such as schools not using the opportunity to develop upon children's knowledge in this area, and the nature of today's lifestyle.<br><br>A wide range of information sources were cited such as TV, fundraising, school initiatives, Safe Route to Schools, the media and news. Views were mixed as to whether school based activities were reinforcing or contradicting what was learnt in the classroom. Fast food was provided in canteens whilst teaching was focusing on healthy diets. Children may | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability:**<br>May be applicable to other schoolchildren and parents in the |

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| young people and parents.<br><br>**Study design**: Discussions and interviews<br><br>**Funding**: Scottish executive Social Research<br><br>**Quality**: + | | methods were used. This is based on the assumption that behaviour is determined by the ways that events are constructed by the individual. Different people have different constructs for events but a large number of these will also be shared.<br><br>Constructs are hierarchical so that a potential behaviour may be offset by a more important construct.<br><br>In another school, two focus groups were each split into a 'red' and 'blue' team. In both focus groups girls chose one team and boys the other. Each team was presented with images of transport modes, and one team were asked to think of positive reasons for using the transport, whilst the other team were asked for reasons why the mode would not be a good idea.<br><br>Another school asked groups to draw pictures of their most liked mode of transport and for reasons that they liked or disliked the modes in the images that had been produced. Older children were asked to draw pictures of a journey, and then draw the opposite scenario using the same mode.<br><br>Survey across 4 schools.<br><br>**Data Analysis**:<br>NR | be aware of these conflicts but not question them.<br><br>In addition, activities taking place in the home may conflict with what children learn in school. One view was that parents may feel that their flexibility is limited in terms of walking children to school because of employment. Employers could thus provide more flexible working practices.<br><br>Many were reluctant to suggest prescriptive changes to the curriculum to cover sustainable transport issues. Rather, educational initiatives such as citizenship indicators could be linked to the curriculum.<br><br>The interviewees noted a range of factors that acted against the development of sustainable travel patterns, including a culture of consumerism and the orientation toward car ownership. There is a tendency for higher social groups to walk for leisure as a healthy activity, rather than incorporating it into daily life. Peer pressure was a significant factor for young people. For example if cycling is not socially acceptable in certain groups it will not be taken up. Where cycling is taken up the cycle must be seen to be 'cool' and probably expensive. This has implications for secure parking.<br><br>*Case Studies in 12 schools*<br>At primary school level, children were keen on walking and cycling, recognising the health and environmental benefits. Both modes provided personal freedom, independence, the ability to explore surroundings alone and with friends, and have fun. The modes were used for leisure and transport and there was a latent demand for making more specific journeys by bike, particularly in boys. This mode was limited by parental choice related to safety and timing / convenience as well as school influence over cycling policy and storage facilities. | UK. |

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| | | | In older children walking was favourable for health and environmental reasons. Levels of cycling were lower in this age group and attitudes less positive with increasing age. There was evidence of suppressed demand but peer pressure and the perception of fashion and coolness was a strong factor. Expensive bikes required security.<br><br>Personal construct analysis showed *fun / boring* as important to younger pupils. Cycling was constructed as fun by younger pupils but not older ones. *Cool / uncool* was important to P6/7 groups. This is a social construct- not just what I think but how I think others see me. In S3 the constructs became practical, such as *carrying a lot / can't carry much; has bike racks / does not have bike racks; safe/ risky.*<br><br>Awareness of the benefits of car use are evident at an early age, and the negative aspects of cycling such as getting wet, slow speed and risk of theft replace the fun aspects.<br><br>At S3 *independence / need someone else to take you* and *can go with friends / loner* became important.<br><br>*Survey*<br>The stated current rate of walking was 37%, and 2% cycling. However, 9% stated they would prefer to cycle whilst 28% preferred to walk. More boys than girls would prefer to cycle. Reasons for not cycling:<br>• Bike could get vandalised<br>• Bike not cool<br>• Bike rack not safe<br>• Not allowed to take bike<br>When asked how they would prefer to travel in the future, for example to work, 88% stated by car compared to 3% walking and 4% cycling. Walking was seen as cool by 58% of girls and 46% of boys, whilst cycling was seen as cool by 31% of girls and 49% of boys. 66% of girls did not see | |

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| | | | cycling as cool and trendy.<br><br>Walking and cycling were less acceptable in years S3 and S$ with some recovery in older pupils. Most information was sourced from parents (38%) with school assemblies next largest source (35%). The least information was from the web (5%). Information had influenced change of travel mode in only 2%.<br><br>Across groups, the most important factor for travel mode was getting to school on time. Weather was the second most important factor followed by stranger danger, health, cost friends, and then personal flexibility. The environment was ranked 10th out of 11 factors. Boys ranked cost higher than girls whilst girls ranked travelling with friends higher than boys.<br><br>Urban dwellers were more concerned with cost than rural, and lets me travel with friends was more important to rural dwellers.<br><br>*Parental survey*<br>Bike security and road safety for boys were specific parental issues. In rankings, stranger danger is the second most important factor for parents, even though the actual risk is not known. Parents were considerably more in agreement with the statement that children walking or cycling to school would be healthier and fitter than were the pupils. Trends in the views were similar between parents of primary school children and secondary school children, though stranger danger was perceived as a higher risk for primary school girls. | |
| **Author**: Hynds & Allibone<br><br>**Year**: 2009<br><br>**Setting / country**: | **Number and characteristics of participants**:<br><br>N=29 (93% response). Experienced walkers | **Intervention aims and content if applicable**:<br>Walking for Health (WfH) supporting over 525 led health walk schemes.<br><br>**Data collection methods**: | **Main Themes relevant to research question**:<br><u>*Walking motivation*</u><br>No differences between motivators in new / experienced walkers or in what motivates the onset / maintenance of walking.<br>Social contact, improving health and the natural environment | **Limitations identified by author**: NR<br><br>**Evidence gaps and/or** |

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| UK; London and Birmingham<br><br>**Aim of study**: To find out what motivates individuals to participate in organised walking activity.<br><br>**Study design**: Focus Groups<br><br>**Funding**: Natural England<br><br>**Quality**: + | (>18 months)<br>New walkers (< 6 months)<br><br>**Gender:** 58% women<br>**Age** 35-84 years<br>14 over 60 / retired<br>1 aged 45-54<br>4 aged 35-44<br>10 Unknown<br><br>**Ethnicity:**<br>18 White British<br>2 Black Caribbean<br>1 Asian Indian<br>1 Asian<br>6 Unknown | Focus Groups (2 in each city; 2 hours duration) using a range of techniques such as paired discussions, post-it ordering and themed exercises.<br><br>**Data Analysis**:<br>Walking motivation<br>Walking likes and dislikes<br>Walking wishes for the future<br><br>Transcriptions reviewed, coded and analysed according to thematic framework. | were key motivators for initial and continued organised walking across all 4 groups. The strongest motivator was the social aspect.<br>*Social Contact*<br>Involvement in WfH allows participants to make meaningful connections with others. There is mutual trust and understanding between walking group participants. They rely on each other for support and often feel a strong bond with other members. There is a great deal of loyalty toward their groups demonstrated by regular attendance and a desire not to 'let others down'.<br><br>The commitment aspect may be related to stage of life since in the older generation it is less acceptable to let others down. WfH provides a sense of belonging and identity, maybe because of the age similarity; they may have more in common and share similar values. Social capital and social cohesion can therefore be built upon by WfH activities. Important aspects were knowledge sharing and learning new things such as recipes, names of plants, what's on offer at the supermarket, and the history and geography of the local area.<br><br>There were extended social activities from the group such as going to the pub or having Christmas lunch. These aspects are particularly important following bereavement and a period of isolation. There was a sense of community, where walkers would help each other, walk slowly to assist others. The negative side to this was a tendency for cliques to form; this was expressed by new walkers; cliques could be a de-motivator for new members. Some thought it was a key role of the walk leader to ensure that new walkers felt welcomed. There is therefore a need for leaders to work with the group dynamic to prevent people of different age, ethnicity and abilities feeling segregated.<br><br>*Improving Health*<br>Groups provide a n opportunity to gradually build up physical | **recommendations for future research**: How being part of the environment might motivate a desire to change environmental behaviours.<br><br>Under-represented groups could be approached to find out why they do not participate. Those that dropped out could also be approached to find out why.<br><br>**Applicability:**<br>May be applicable to other walking groups in the UK. |

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| | | | activity in a relaxed and informal environment. This may be particularly important after illness or surgery. There was a reported 'feel good factor' and even relief from depression.<br><br>Walks were an easy, convenient way to build exercise into everyday life, lose weight and improve health. The age profile reflects that other sectors of society may not be able to attend due to family or work commitments. They may be too tired, or be put off by the focus on 'health'.<br><br>*Enjoying the natural environment*<br>This was cited by the majority of walkers as a motivator. However, the level of engagement with the environment appears to be passive and an opportunity to observe the view. Variation and location of the route is important. Getting 'fresh air' was regularly mentioned. The walks were mainly fast paced so there was little time to stop and appreciate scenery. The route might be re-visited following the walk to be able to take more time. Some were frustrated with the lack of scenery and were keen to go further afield. Most cited wildlife as a motivation for walking. Two types of walkers were suggested, those that want to be sociable and carry out exercise and those that are more serious hikers that look at the scenery, and there was a need to know which one you were. Watching wildlife could also be carried out whilst alone, especially for men. There were mixed views about terrain, some preferred flat / even ground for safety (mostly women) and others enjoyed more variation for the interest and challenge.<br><br>*Influential factors*<br>*Background*<br>Most of the focus group participants had always walked or had an interest in the outdoors, or both. This was either because of a passion shared with the family when growing up, or a necessity, or a way of life. Walking often stopped due to a change of circumstances and the group allowed them to rediscover it. This implies that people are more likely | |

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| | | | to join if they already have an interest in walking. One participant had been married twice and neither husband enjoyed walking, so despite having taken part in walking weekends prior to marriage, there had been a lull.<br><br>In contrast, one of the younger participants had been inspired to walk independently in the countryside by the group despite expecting not to enjoy it.<br><br>*Lifestyle*<br>The flexibility and convenience of walking groups was appreciated, especially as walking can be accommodated into daily life. Also valued was the ability to turn up without booking and at no cost. Some liked not having to think about anything, letting someone else be in charge. However, there was a routine and a structure which was important for those that had retired or become unemployed. More men were joining in the West Midlands because they had been made redundant and were looking for something to do. Some felt there was a good range of start times from which to choose a convenient walk, whilst some felt time constrained whilst on a walk (mainly younger participants) because they had to 'hurry and get back'.<br><br>*Preferences*<br>*Walk Type*<br>Walking in the countryside was enjoyed to appreciate views and get away from built up areas. There was strong feeling that some routes were repetitive and some had become boring. Not many had experienced 'guided' walks with a specialist who pointed out interesting items on the way, but those who had found them interesting. People enjoyed discovering new places in the local area and would value more information particularly in relation to local history and nature. It was felt that this was the role of the walk leader. People were becoming attached to their locality through walking.<br>There were mixed views about what some people wanted | |

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| | | | from a walk in relation to place, distance, duration and terrain. For some, pace and distance were important whilst others were happy with shorter, more gentle walks. There was agreement that there needed to be a range of types of walks to suit preferences and capabilities, at different times of the day and week.<br><br>*Sense of achievement*<br>Many reported feeling a sense of achievement on completing a walk, going walking even when you didn't feel like it was good for those who lacked motivation or had to make more effort because of health problems. Some enjoyed the challenge of completing a new walk, a difficult walk or a fast pace. They enjoyed feeling tired at the end of a walk but said it was 'good tired' associated with satisfaction. Some walkers felt proud when they saw the count on their pedometer after a walk.<br><br>*Safety*<br>Safety was raised in relation to weather, terrain, and accessibility. Rain, mud, snow and ice were concerns, and there were fears of falling over. Bad weather was also reported to slow people down and made the walk less enjoyable. People were less likely to attend in bad weather though if it started raining during a walk they tended to continue. Weather could determine the type of walk preferred, such as walking in the woods in rain.<br><br>Accessibility was restricted by stiles, steps, uneven ground and transport. Stiles could be difficult to climb over and be dangerous if not well maintained. Steps were difficult with pushchairs and for people in wheelchairs. Interesting walks were often further afield, which required a car.<br><br>The role of leaders was viewed positively. Most felt that they did an excellent job attending to everyone's welfare, though some thought that health and safety was taken to extreme. For example new walks had to be tested before the group | |

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| | | | could try them.<br><br>*Walker aspirations*<br>Experienced walkers seemed happy with the range of walks, whereas new walkers wanted more variation. | |
| **Author**: Ipsos / MORI<br><br>**Year**: 2006<br><br>**Setting / country**: UK<br><br>**Aim of study**: To understand the motivations and barriers to PA, especially walking, and explore understanding of health issues related to lack of PA and benefits of PA.<br><br>**Study design**: Focus Groups<br><br>**Funding**: Ramblers Association<br><br>**Quality**: + | **Number and characteristics of participants**:<br>Relatively inactive socially deprived adults.<br>Two age groups: 18-40 years and 35-70.<br><br>No numbers given. | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>Focus Groups<br>Journal to record walks<br>Disposable camera to record walking areas.<br>Notes on conversations about walking.<br><br>**Data Analysis**:<br>NR | **Main Themes relevant to research question**:<br>*Attitudes to exercise*<br>Main motivators to walking were reported:<br>• To be more healthy<br>• Managing weight (especially women)<br>• Improve body or body shape<br>• Age (especially older group)<br>• Tackle stress / mental health<br>• Time for self<br>• Social activity<br>• Enjoyment (especially men)<br>• Children (especially parents)<br>• Dogs / other animals (especially dog owners)<br>• Deal with aggression (especially men)<br>• Rush of adrenalin (especially men)<br>• Tackle boredom (especially men)<br>Many were aware of general obesity debate; women felt pressured to manage weight and achieve a slim body shape. Exercise allows them to eat what they want and still achieve this.<br>Older people felt that ageing necessitates more attention to health and body.<br>Men also aware of physical benefits but more likely to cite enjoyment, especially if competitive (e.g. sport). Both men and women use exercise as a valuable time to think.<br>Dogs can be a motivator as they need to be walked frequently, though it may be the needs of the dog that are the priority rather than the fact of walking.<br><br>*Barriers*<br>• Time constraints (especially young group)<br>• Lack of facilities | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>As in text – ideas for motivating different groups relating to their receptiveness and perceptions of walking.<br><br>**Applicability**<br>UK based study, specifically targets low income groups. Some barriers such as bad weather and facilitators such as dog walking may be generalisable across other groups. |

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| | | | • Expense<br>• Children<br>• Personal safety (women)<br>• Laziness / lack of motivation<br>• Tiredness<br>• Work commitments<br>• Bad weather<br>• Getting older (especially young group)<br>• Don't enjoy (especially women)<br>• No-one to go with<br>Lack of facilities in the area may mean more time is needed to travel.<br><br>*Walking as exercise*<br>• Social aspect of walking with others<br>• Walking the dog.<br>• Having time to think and tackling stress<br>• Seeing new places on holiday.<br>• Personal safety important, especially in deprived areas. There was an overall feeling that Birmingham holds so many dangers and is not conducive to walking. Park paths are often hidden and dark.<br>• Weather was an issue for walking.<br>• Men didn't see walking as strenuous enough and were sceptical about the benefits compared to other exercise. Difference between walking and 'proper' exercise – not left short of breath or sweating.<br><br>• Birmingham seen as lacking enough open spaces to provide for a long enough walk. Whilst carrying out the tasks, many were surprised at how many areas were available in which to walk (e.g. parks, by the canal).<br>Suggests an information gap among this community.<br><br>• Habit– not used to doing exercise. This needs to be | |

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| | | | broken to encourage PA. Many became more committed following the tasks as they broke the cycle of inactivity and intended to continue walking.<br><br>Women were the most receptive group, they had a positive experience of walking, though there were safety concerns, especially in urban deprived areas where crime levels are perceived to be high. Teenagers hanging out presented a feeling of intimidation, especially in parks. Very few reported walking at night, especially in winter. Women felt less vulnerable when walking with other people. This also gives the opportunity to spend time together ('walking and talking'). It also passes the time more quickly and so doesn't feel like an exercise session. Women also enjoyed the scenery and seeing different things. For some it was a rare chance for solitude, relaxation and to think. Despite having tired legs, they felt the physical benefits.<br>Women were more motivated to manage their weight than men and the fact that it did not feel uncomfortable (sweaty etc.) was a bonus, particularly when they learned that as many calories are burned in one mile of walking as in one mile of running. It is also low in cost and no equipment is required.<br>For women then, walking became an 'ideal' form of PA. (*Walk & Talk programme*)<br><br>Parents were motivated as they could take young children to see wildlife and animals, or go to the shops. The children enjoyed walking by the canal. The experience provide parents with the feeling of being a 'good' parent as they are improving their children's health and education as well as spending quality time with them. The children become more tired following the walk and so they sleep more easily. Focus on children is seen as prudent as they get their parents walking. In addition, children walking today will adopt habits that will continue into the future.<br><br>Time is a barrier for parents, and often they do not think | |

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| | | | children will enjoy walking. (*Little legs, Big Strides programme*).<br>Promoting walking within schools as well as to school and back were ideas for the future.<br><br>Men were less receptive to walking, particularly the younger group. For most men walking was relaxing and provided time to think, particularly following a busy / stressful day at work. Being outdoors was a motivator as men felt this was lacking in their life. However men did not enjoy walking in the same way as women; some found it tedious or boring and were more likely to drive. They found it harder to persuade other men to join them and so from the social aspect, preferred jogging or going to the gym. They are less likely to feel that walking is challenging enough as a form of exercise unless the walk is of a long duration. In this way they are more likely to walk as part of a challenge or event. This also gives more sense of achievement and satisfaction. Of the men, the older group were most likely to respond to a walking message (*Walk the Walk or Get Walking*). Need to highlight the health benefits so that it is not seen as a lesser form of exercise. | |
| **Author**: Kirby<br><br>**Year**:<br>2009<br><br>**Setting / country**:<br>Scotland, UK<br><br>**Aim of study**:<br>To explore views of schoolchildren on active travel to school and ideas about promotion strategies for school based interventions. | **Number and characteristics of participants**:<br>4 primary (year 7)<br>3 secondary schools (years 1 and 2)<br><br>66 participants<br>(29 boys; 37 girls)<br>Age 10-13 years | **Intervention aims and content if applicable**:<br>Active travel transition projects<br><br>**Data collection methods**:<br>13 Focus Groups (2-8 participants, both girls and boys):<br>• What might make walking / cycling to school easier<br>• Walking or cycling to school would be…<br>15-20 minutes duration<br><br>**Data Analysis**:<br>NVivo 7 software | **Main Themes relevant to research question**:<br>*Perceived benefits*<br>• Health and fitness<br>Awareness of health benefits high. One response that exercise would help her look better. Mental health benefits of being outdoors and getting fresh air; feeling energised and alert.<br>• Environmental factors<br>Concern about pollution associated with cars, and global warming. Links between active transportation and helping to reduce pollution and use of fuel.<br>• Social factors<br>Opportunity to meet and spend time with friends, make new friends, talk to friends before school.<br>Sense of freedom and enjoyment.<br>No child reported disliking active travel – some had always | **Limitations identified by author**:<br>Views are likely to be specific to this age group. This group has been shown to have greatest decline in PA.<br>Views may be influenced by geographical location (these were rural and semi-rural areas).<br>The participation of the schools in active travel transition may have led to more |

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| **Study design**: Focus Groups<br><br>**Funding**: Sunstrans Scotland, and the Scottish Health Promoting Schools Unit.<br><br>**Quality**: ++ | | Coding independently by 2 researchers, discussed and refined and then applied to all transcripts.<br><br>Content analysis | travelled this way.<br>Greater road awareness, increased familiarity with locality, less reliance on parents, sense of independence.<br>Less costly.<br><br>*Perceived barriers*<br>• Personal safety<br>Amount of traffic or busy roads to cross (both walking / cycling).<br>Unsuitable pathways. Stranger danger not primary safety concern.<br>• Weather conditions<br>Would travel by car if raining or cold. Some actively commute despite conditions.<br>• Time and distance<br>Active travel perceived as slower – might be late for school or need to get up very early. Associated with distance – some felt they lived too far away but would walk if they lived closer.<br>• Image<br>Wearing cycle helmets seen as 'uncool' and unpopular as they would mess up hair (especially boys). Not having opportunity to make appearance presentable on arrival.<br>• Physical discomfort<br>Feeling tired and carrying heavy school bags were deterrents especially on long distances.<br>• Physical environment<br>Lack of cycle paths; poor street lighting.<br><br>Age related differences – younger secondary school students mentioned feeling intimidated by older students hanging around in streets and sometimes blocking roads or chasing on bikes.<br>Fears of vandalism or theft of cycles – bikes not safe enough at school. Some parents shared these fears and didn't allow bikes to be taken to school.<br>Laziness – other forms of transport easier. This lack of | favourable views.<br>Some of the focus groups had a parent or teacher present which may also influence responses.<br><br>**Evidence gaps and/or recommendations for future research**: Research with younger and older children as well, as in urban schools may prove beneficial.<br><br>**Applicability**<br>UK based study. There is no reason to believe that findings cannot be generalised to other schoolchildren in the UK. |

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| | | | motivation not apparent in younger children.<br><br>*Social influences*<br>Parental decisions were common, and these could exert positive or negative influence. Positive influence was due to health benefits, whilst negative influence was due to safety concerns.<br>Secondary school children more likely to make their own decisions, or jointly. Influences were weather, route to school, or availability of someone to travel with. Some walked with friends, which was a motivator. Others walked with siblings.<br><br>*School support*<br>Most felt that schools encouraged active travel (all participating in programme at the time).Some provided cycling proficiency training which they needed to pass before cycling to school in some cases. Healthy living in general was seen to be encouraged through posters and initiatives. Strategies to promote active travel included better cycling storage facilities, organised school walks, rewards for active travel. Though health promotion was active in school, teachers were not always regarded as good role models (…"*our teacher when she goes out to [local shop], that's right over there, during school time she always takes the car*").<br><br>*Potential strategies to promote active travel*<br>Offering an incentive or reward was a popular suggestion, for example bicycle bells or umbrellas. Giving out a cereal bar. Competition with a prize.<br>Group cycling or walking. Some schools had organised these in final primary school year to the new school, and these were well received. | |
| **Author**: Lockett<br><br>**Year**: 2005 | **Number and characteristics of participants**: | **Intervention aims and content if applicable**:<br>NA | **Main Themes relevant to research question**:<br><u>*Barriers to walking*</u><br>Two participants mentioned safety related to crime.<br>*Traffic Hazards* (9 photos). | **Limitations identified by author**:<br>Photovoice technique; did not |

| Study details | Population and setting | Methods | Findings | Notes |
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| **Setting / country**: Ottawa, Canada<br>**Aim of study**: To examine environmental factors influencing the walking choices of elderly people.<br><br>**Study design**: Photovoice<br><br>**Funding**: Health Canada / veterans Affairs Canada Falls Prevention Initiative<br><br>**Quality**: ++ | 13 senior citizens took photographs. 8 also took part in focus groups. 14 additional seniors participated in focus groups (total =22).<br><br>18 female<br>4 male<br><br>Age 60-90 (mean 76)<br><br>5 had fallen in last 12 months.<br><br>Most physically active with the most common activity walking.<br><br>Proportion of walkers higher (85.7%) in rural areas than in urban (42.8%). | **Data collection methods**:<br>Photovoice: Community members take photographs and use the pictures to facilitate a conversation between themselves and outside groups (Wang & Burris 1994).<br>Photos of areas in neighbourhood that seniors felt they or others would feel safe and comfortable to pursue leisure facilities such as walking.<br>Logs completed by participants. (86 photographs in total)<br>Follow up focus groups (4); Urban English; Urban French; Rural English and Rural French.<br>Between 6-27 participants in each group.<br>Asked to describe photos that best depict barriers or facilitators to walking / PA (39 photos).<br><br>**Data Analysis**:<br>Atlas.ti software | Participants were concerned about being hit or splashed by a car, as they often had insufficient time to cross roads, visibility was often poor at busy crossroads, and traffic lights were often located poorly in relation to the route.<br>Pedestrian crossings did not allow sufficient time to cross the road and vehicles sometimes did not stop when signalled to do so.<br><br>*Falls* (27 photos)<br>Concerns were around cracked or uneven pavements or surfaces that were not flat, especially difficult when using a walking frame. In rural areas there were often no pavements. Those with pavements were fast roads and country roads were rocky. Pavements would often just end at a car park, particularly near to shopping areas. Sometimes ramps were available but these were often cracked, uneven or steep with no railings. Car parks were not regarded as being constructed with pedestrians in mind.<br>Sometimes stairs and entrances were inaccessible, as were some public buildings, for people using assistive devices.<br>Exterior hazards were made worse by the presence of snow and ice. One woman showed that although her apartment was well connected by streets and traffic lights to the shopping mall, and the distance was only 600 metres, the pavement was sloping, curbs were difficult to mount using a walking frame, there was snow and ice and a car park to negotiate.<br><br>*Facilitators to walking* (47 photos)<br>Amenities that were close by such as the post-box, and shops.<br>Close to bus routes, and town.<br>Need for safe options such as places where snow has been cleared.<br>Places to sit on the route, as well as toilets.<br>Aesthetically designed.<br>Covered, pedestrianised areas on the route. | ask for social factors to be photographed. Longer study period would include different seasons. Images that were not photographed were excluded knowledge.<br><br>**Evidence gaps and/or recommendations for future research**: Researcher might accompany participant to take photos so that a wider range obtained.<br><br>**Applicability**<br>Living in Canada will mean longer, colder winters than in the UK. Nevertheless, the snow and ice remains a problem in the UK.<br>Infrastructure may differ in Canada than in UK. Many of these hazards are transferable, depending on particular environments. |

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| | | | Discussion: Seniors are often forced to trade-off hazards (e.g. rough pavement or busy road. | |
| **Author**: Lu<br><br>**Year**: 2011<br><br>**Setting / country**: US; Texas<br><br>**Aim of study**: To explore corridor walking behaviours and perceptions of corridor walkability in assisted living residents.<br><br>**Study design**: Focus Groups<br><br>**Funding**: Robert wood Johnson Foundation Active Living Research Dissertation Grant. Nurture by Steelcase Dissertation Grant.<br><br>**Quality**: ++ | **Number of participants**: 6 Assisted living Facilities with >10 beds. Residential (3) or mixed – use residential and commercial (3) neighbourhoods. Crime rates in 4 ALFs were higher than 2006 national average.<br><br>Four neighbourhoods had continuous pavements, speed limits of all were ≤35mph. Three ALFs were close to main roads or busy city streets.<br><br>Only one campus had continuous pavements, 2 had low-speed driveways. 5 had gardens / courtyards with walking and sitting areas.<br><br>ALFs had 44-120 units / apartments. Buildings were 1-6 stories and were in a variety of shapes. Two had congregated activity spaces such as a gym, chapel. In others, the spaces were located far away from each other. Corridor lengths varied from 215-795ft. Sitting | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>Assisted living Facility Walking Environment Checklist (ALF-WEC)<br>To record environments indoors and outdoors in detail.<br><br>Focus Groups (7-11 participants)<br>45-90 minutes duration<br>2 researchers facilitated the groups<br><br>Where people walk<br>Opinions on the walking environment<br><br>**Data Analysis**:<br>Constant comparative method. (2-stage procedure).<br>Maximised variety in sampling. | **Main Themes relevant to research question**:<br>*Why do/don't residents choose to walk indoors*<br>Walking indoors reported as safe, comfortable, convenient, protective from bad weather.<br>However, it lacks things to see (same things all the time) and is a limited walking area.<br><br>Some residents were not encouraged to walk outdoors because of crime concerns.<br>In contrast:<br>• The corridor was always secure.<br>• There was immediate availability of help if one were to fall.<br>• Did not need specific plans; was conveniently accessible<br>• Comfortable to walk on carpeted floor and corridors with seating<br>• Free from weather conditions<br>• Those with outdoor landscaping walked there because one could see the cloud formations, hear birds singing and see the sun go down.<br><br>*Main types of corridor walking*<br>1. Walking to destinations: most frequently mentioned. Walking was to activity and eating spaces, and to the mailbox.<br>2. Walking for exercise: Over a third of residents reported walking for exercise. Some walked one floor then took the lift and walked another floor.<br>3. Walking for interaction: Not as popular, though 1-2 in each group reported walking the corridor solely to interact with others. They liked to meet with people and see what was going on in the facility. Conversation was important in this group. | **Limitations identified by author**: Participant views may not represent those of non-volunteers. Varied ALFs but within a single climate and cultural zone.<br><br>**Evidence gaps and/or recommendations for future research**: Correlation studies to assess the relationship between walking behaviours and corridor design features in a large population. Interventional studies that examine changes in walking behaviour in response to modified corridor environments.<br><br>**Applicability:** Issues raised could apply to elderly people residing in care homes in the UK. |

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| | areas along corridors were available in 3 facilities.<br><br>50 participants<br>(40 invited; 10 uninvited of whom 2 were <65 years and could walk unassisted; 2 used a wheelchair and 6 a power scooter).<br><br>≥ 65 years<br>Able to walk<br>Able to answer questions in English<br><br>43 females<br>Mean age 84 years (60-99).<br>15 walked without assistive devices<br>22 used walkers<br>2 used sticks<br>1 walked using a wheelchair for support | | *Important environmental features*<br>Safety: The greatest concern, especially falls. Handrails and floor-covering essential features.<br>• Comfort / convenience: Seating in the corridor was the most frequent mentioned feature, followed by the length (too long for some, not long enough for others) and width (not wide enough for people to walk together or pass slower walkers) of the corridor, size of elevator, organisation of activity spaces, and nearby presence of a toilet.<br>• Aesthetics: Pictures, artwork, window views and plants added to the pleasure of walking. Two facilities displayed artwork by the residents. | |
| **Author**: Matthews<br><br>**Year**: NR<br><br>**Setting / country**: UK<br><br>**Aim of study**: To examine the experiences of walking promotion professionals on | **Number and characteristics of participants**:<br><br>28 programmes spread across UK<br><br>21 programmes had health aims, 7 did not have health aims.<br><br>Interviews with 28 | **Intervention aims and content if applicable**:<br>A range of walking programmes organised by Rambler's Association.<br><br>**Data collection methods**:<br>Interviews<br><br>**Data Analysis**:<br>Analytic induction:<br>• Data scanned for categories of phenomena. | **Main Themes relevant to research question**:<br>*Recruitment*<br>One of the drivers for recruitment is the aims and objectives / specific population of the intervention.<br><br>Led walks seek individuals based on walking criteria. Open to all include all groups (typical take-up are white, middle class, retired).<br><br>Health walks seek out on health aims. In particular, sedentary population, people living in deprived areas. | **Limitations identified by author**: NR<br><br>**Evidence gaps and/or recommendations for future research**: NR<br><br>**Applicability**<br>Based in UK; specific |

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| the range and effectiveness of recruitment strategies used within community based walking programmes.<br><br>**Study design**: Interviews<br><br>**Funding**: British Heart Foundation<br><br>**Quality**: + | Programme Managers. | • Relationships between categories are sought.<br>• Typologies and summaries are written<br>• Case analysis / negative and discrepant cases sought to modify explanation or theory. | Therefore different techniques used to recruit – material in community spaces for the first type of intervention will not be accessed by those targeted in the second. This requires working with organisations and agencies already working with particular groups such as ethnic minorities (hard to recruit groups). Typically this was face-to-face word of mouth prompting.<br><br>Trying to motivate hard to reach groups was regarded as hard work.<br><br>Only 5 of the programmes were working to a conceptual framework such as adoption of active targeting, or use of bio-psychosocial theory to recruit at appropriate stages of change.<br><br>The remaining 23 recruitment strategies could be categorised as 'active' (programme representative makes contact with potential participant), or 'passive' (participant makes first contact). The only active method used by 'open to all' programmes was word of mouth. These were believed to be the most successful by programme leaders. Only a small number believed that fliers and posters were effective. Other types of programme tended to try different approaches, as many as they could manage.<br><br>Three respondents had a background in marketing; they favoured word of mouth strategies. However, active approaches are time consuming and draining of resources. Resource availability was therefore an important factor in recruitment method selection.<br>None of the programmes worked within a specific budget, though a few held a 'publicity' budget. Funded respondents spoke of under resource for recruitment ("*I'm restricted to leaflets*..")<br><br>*Sustainability*<br>Degree of evaluation varied, with 27 engaging in the | to walking. Process barriers and facilitators generalisable to most walking programmes. |

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| | | | assessment of 'process'. Most assessed participation, but not assessed exposure, delivery or context data. Health walks used the Outdoor Health Questionnaire (OHQ), however none of the programmes were scrutinising baseline data to check if sedentary populations were being accessed. Neither did they evaluate the recruitment method for success.<br><br>Only one programme evaluated outcomes systematically. Ideas for recruitment are listed in the Membership Handbook, but a range of methods are advised. Word of mouth is described as 'recommendation to a friend'. This means that only those of similar backgrounds will be contacted. Health-related social marketing is now embraced by two agencies. Skill in marketing was highlighted as a motivator to one of the publicity officer's audience ("*We unashamedly did a Valentine's feature this year, because it is like a dating club, our group*"). The principles of social marketing emphasise social rather than health benefits, which is thought to be more persuasive.<br><br>Those working with hard to reach groups demonstrated that to recruit groups that don't already walk, there is a need to understand what will persuade them to walk. However, most recruitment decisions were taken by programme coordinators 'on the ground', often piecemeal. They have not received any formal recruitment or marketing training, therefore there is a lack of training delivery.<br><br>*Recruitment and retention: the role of the volunteer leader*<br>There was universal appreciation for the walk leader volunteer in terms of their continuity of service with the clubs. The rapport that walkers have with volunteers over time was thought to be a major facilitator to retention of club members. All interviewees thought they were successful in recruiting and retaining volunteers, without whom the walking programmes would be unsustainable long term. | |
| **Author**: McKenna | **Number and** | **Intervention aims and content if** | **Main Themes relevant to research question**: | **Limitations** |

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| **Year**: 2007<br><br>**Setting / country**: Derby; UK<br><br>**Aim of study**: To explore the experiences of urban commuter cycling (UCC).<br><br>**Study design**: Interviews<br><br>**Funding**: NR<br><br>**Quality**: ++ | **characteristics of participants**:<br><br>9 individuals who cycle to work at least 3 times per week for longer than 6 months.<br>7 males<br>2 females<br><br>Time cycling each day was around 2.5 to 5 miles or 15-30 minutes each way<br><br>Experience cycling ranged from 18 months to 27 years. | **applicable**:<br>NA<br><br>**Data collection methods**:<br>Interviews (up to 90 minutes duration).<br><br>**Data Analysis**:<br>Hermeneutic Phenomenology<br>Four dimensions:<br>• Time<br>• Space<br>• Body<br>• Human Relations<br>Each researcher analysed independently then merged findings for each participant. | *Lived experience of commuter cycling*<br>Decision to cycle made in respect of the weather. Equipment is packed and ready.<br>Often the journey is stop-start<br>Have to have wits about you<br>Having to avoid being knocked off<br>Obstacles include manhole covers, rough gutters, bad road surfaces.<br>Feeling vulnerable turning right to cross traffic.<br>Hoping overtaking vehicles keep on track (get 'wheel wobble').<br>Need extra time at work to get sorted, such as having a shower.<br>Fumes on the road<br>Having to wear wet clothes on the way home.<br>If sunny might take longer route.<br>Punctures mean having to walk the bike home.<br>Wind, rain, ice, dark are barriers.<br><br>Feeling segregated from others, including other cyclists compounded by near misses with larger vehicles.<br>Pedestrians can also walk in the way.<br>The space allocated to cyclists on the road often appropriated by parked cars, buses, glass, deep drains, pedestrians. When this happened, one participant felt less safe.<br>Invisibility to road users | **identified by author**:<br>Not possible to generalise findings.<br>The study doesn't show the passage that was made by the participants to cycling.<br>Tendency in individual interviews to underestimate personal responsibility.<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability**<br>UK study so may be applicable elsewhere in the country.<br>Focuses on cyclist commuters so issues may be specific to this type of cycling and individuals who cycle to work rather than for pleasure. |
| **Author**: Milton<br><br>**Year**: 2011<br><br>**Setting / country**: UK | **Number and characteristics of participants**:<br><br>9 Programme staff<br>1 co-ordinator from a different intervention | **Intervention aims and content if applicable**:<br>"Furness Families Walk4Life"<br>Community based programme to promote walking in a family group (mainly with children aged 2-11 years) for leisure, exploration and | **Main Themes relevant to research question**:<br><u>*Staff interviews*</u><br>*Working in partnership*<br>Partnership between 'Ramblers' and 'Action for Children' was the aim, in order to foster shared values across the two associations.<br>Ramblers have a good coverage of walking volunteers | **Limitations identified by author**:<br>Under-representation by men. Did not interview those that tried the programme once and didn't |

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| **Aim of study**: To evaluate a family based walking programme.<br><br>**Study design**: Interviews and focus groups<br><br>**Funding**: Department of Health<br><br>**Quality**: + | 11 participants (9 female) that had been on walks during the led phase (approximately one third of programme participants). | transportation.<br><br>Key elements include led walks (4 weeks), tailored resources, a 7 week period of independent walking, a celebration event at week 12 and tele-support.<br><br>Promotion was through leaflets posted to 1500 households as well as advertisements in local venues.<br><br>**Data collection methods**:<br>Interviews: 9 programme staff with a range of roles and seniority. One co-ordinator from another intervention was also interviewed.<br>4 interviews (25-40 minutes) and 2 focus groups (60 minutes) with participants.<br><br>**Data Analysis**:<br>Deductive (from the interview schedule themes) and inductive (key issues within the themes) reasoning.<br>NVivo software. | across the country but not the expertise to do this with families or children.<br><br>Difficult to get off the ground initially but improved after introductions made and local; organisation became more collaborative.<br><br>The pilot successfully engaged other initiatives despite initial animosity. This was achieved by being clear that the project benefitted from efforts to communicate goals and work alongside, rather than replace existing initiatives.<br><br>*Planning and preparation*<br>The run in time was only four weeks, and this did not leave enough time for planning and promoting the programme.<br><br>*Programme delivery*<br>Employing a Project Officer from Ramblers who was able to form relationships with Action for Children staff during delivery was crucial. This officer got to know all the admin staff who were key to what was going on in the centre.<br><br>Support walkers (staff from Action for Children) were difficult to recruit due to lack of communication. Those that did engage with the programme did so because of the social aspect rather than health benefits (which could be seen to be pushed too hard). They were influential in delivery and consistency of personnel which promoted adherence and group bonding. It may be therefore important to engage support walkers at the development phase.<br><br><u>*Participants*</u><br>Using an existing family oriented service was well received and helped encourage families. The centres were viewed as a good meeting place.<br><br>*Marketing*<br>Participants were unaware of some of the marketing modes; | return, or those that decided not to take part.<br><br>**Evidence gaps and/or recommendations for future research**: How to attract more males and people from BME groups.<br><br>**Applicability:** Applicable to other collaborations that organise family based walking groups. |

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| | | | they had found out about the programme through leaflets at the Action for Children centres. The programme was therefore attracting those already using the centres. In future, advertising in the jobcentres, sports centre and GP surgeries was recommended. Word of mouth was also suggested as the most effective strategy.<br><br>Marketing as a social opportunity (mothers having a chat; walking with the children) as opposed to the health aspect was viewed as attracting people to the programme.<br><br>*Motivation*<br>The programme was attractive to parents wanting activities to amuse their children when they were not at nursery, particularly in the afternoons. It was free of charge and viewed as a good opportunity to spend time as a family.<br><br>*Experiences of led walks*<br>The walks were described as 'fun'; the most enjoyable aspect was social interaction with other families. Another important factor was having a destination or 'goal'. The leader often provided a list of things for the children to look out for such as wildlife and land marks. Incorporating activities such as kite flying or feeding ducks was also viewed positively.<br><br>Participants reported discovering new local areas that they were not previously aware of. In addition, walks in green areas were enjoyed whereas those in the town were not so popular, due to negotiating and walking near busy roads with young children. 40 minutes was regarded as an appropriate duration. An 'escape route back to the centre was suggested in case people wanted to return before the end of the walk.<br><br>One group with low participation rates was disappointing due to the lack of social interaction. People reported 'feeling better' being out in the open, some reported developing confidence and losing weight. | |

| Study details | Population and setting | Methods | Findings | Notes |
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| | | | *Impact on attitudes and walking behaviour*<br>The programme was reported to have made people feel 'a bit better about walking' and made walking more enjoyable. Taking part raised awareness of how much walking they did. After the initial four weeks led walks, most families had continued to walk, but as a family rather than joining up with others. It was suggested that four weeks may be insufficient to develop social cohesion needed to continue as a group. For some families there was a change in parent attitudes to walking, but in some cases the children instigated walking.<br><br>*Usefulness of resources*<br>The resource pack included an activity log, stickers and a series of story books. Some families completed the logs and enjoyed keeping records of walks. Others viewed this as homework and reported feeling pressure to complete them. It was suggested that the pack could contain more routes to facilitate independent walking, and that extended routes could be attempted over time.<br><br>*Recommendations for future implementation*<br>Running walks from different centres on different days helped fit in with time schedules of families.<br>Suggested improvements included that early morning walks were too rushed for those children attending school. Scheduling after 4pm would allow more families to attend. Some families did not attend on wet days, so that indoor activities were suggested for these days. | |
| **Author**: Newton<br><br>**Year**: NR<br><br>**Setting / country**: Greater Manchester, Oxfordshire and Gloucestershire. | **Number and characteristics of participants**:<br>200 members of public aged >65 years. Range of settings. | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>Semi-structured conversational interviews.<br>Physical audit of street where participants reside as well as the wider | **Main Themes relevant to research question**:<br>*Footways and Footpaths*<br>Very few participants felt comfortable using narrow footways. Reasons for this include having to walk on the road to pass people, not being able to stop to talk to people as others cannot get by, and walking slowly, hoping people would walk round them.<br><br>Temporary obstacles such as people parking cars on | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>Recommendations |

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| UK<br><br>**Aim of study**:<br>To investigate the extent to which the detailed design of neighbourhoods are supportive of older people in getting out and about.<br><br>**Study design**:<br>Interviews<br><br>**Funding**:<br>UK Government<br><br>**Quality**: - | | neighbourhood (OSID:WISE).<br><br>**Data Analysis**:<br>NR | pavements, building works reduce the width of pathways. Wider footways therefore preferred.<br>The audit found that 62% of the footways measured were less than 1500mm in width. Urban footways were most likely to be wider than suburban footways, and rural footways in villages were often absent.<br><br>Three quarters of participants reported feeling safe from motorised traffic in their locality. Factors that made them feel less safe included:<br>• Narrow pavements<br>• Bus lanes with buses whizzing by<br>• Cyclists riding on pavements and not using bells<br>• Mobility scooters travelling too quickly along the pavements<br>Cycle tracks were disliked by two thirds of the participants:<br>• Cycle tracks suddenly stop and the cyclist appears on the pavement<br>• Pedestrians are in the middle of the traffic and the bikes<br>Some participants were more positive about cycle paths because walking and cycling are both facilitated. In addition, scooter users stated that they used either the cycling or walking lanes.<br><br>This points to an issue for design; are scooter users cyclists or pedestrians? According to regulations, they can be used on a cycle track providing they do not exceed 4mph otherwise they are a motor vehicle; they are not a pedestrian whilst using the scooter.<br><br>The authors state that the results point to lack of clarification among the public about lane use and about path design (pedestrian paths should not be between cycle paths and the road). In addition, provision for cyclists is needed when the track ends. | for design that allows elderly people to move around on foot, on scooters as well as with walking frames.<br><br>**Applicability**<br>Based in UK so issues generalisable. Specific to elderly population, highlighting some of the issues that might constrain walking. |

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| | | | Tarmac was the preferred material for walking, as it is smooth, has some give, and relatively safe but could be slippery in winter, and uneven if dug up and not re-laid properly.<br><br>Paving slabs were more aesthetically pleasing and a good surface if properly laid. They can however become wobbly or uneven. Uneven surfaces mean that older people have to look down to miss the bumps. In addition, they can result in tripping, and cause vibration in mobility scooters which can be uncomfortable.<br>Gravel was considered less safe, particularly for walking aids.<br>Cobbles were aesthetically pleasing but difficult to walk on but too bumpy. | |
| **Author**: Nguyen<br><br>**Year**: 2005<br><br>**Setting / country**: US<br><br>**Aim of study**: To explore factors that lead organization directors to become involved in the public health initiative and maintain their involvement over time.<br><br>**Study design**: Semi-structured interviews | **Number and characteristics of participants**:<br><br>13 interviews with walking club directors and a public health official.<br><br>575 telephone interviews with current (n=339) and former (n=236) club members | **Intervention aims and content if applicable**:<br>Laval walking Club (14 clubs created 1994-8) to promote physical activity in sedentary adults in suburban area.<br><br>**Data collection methods**:<br>Semi-structured interviews (60-90 mins). Topics:<br>• Describe characteristics of walking club<br>• Describe tasks related to managing club<br>• Advantages and challenges in managing club<br>• Conditions that allow for maintenance of clubs.<br><br>Telephone surveys with current and former club members to monitor physical activity patterns over 2 months. | **Main Themes relevant to research question**:<br>*Characteristics of walking club*<br>Of 13 clubs, 7 had existed for 2-3 years, one for more than 10 years and 5 for less than a year. The total number of members exceeds the number of regular walkers by a factor of 3-4. Clubs that have existed for more than 2 years have more members and more regular participants in sessions.<br>Involvement in activities depends on seasons with more in Spring and autumn compared to Winter.<br>60% of clubs have a single director.<br><br>*Tasks related to managing the club*<br>Three main tasks:<br>1. Management of walking sessions<br>Most organise 2-3 sessions per week in morning or evening or a combination. Most are carried out on neighbourhood streets, in parks or woods. Two held walks in shopping malls.<br>Three activities: Establishing routines; Welcoming walkers to session; Ensuring safety and security of walkers.<br>All routes created by directors, with 8 clubs having between one and three routes and the rest varying each month or every other month. | **Limitations identified by author**: NR<br><br>**Evidence gaps and/or recommendations for future research**: Conceptualisation of the problem of sustainability should be integrated with the role of users and services.<br><br>**Applicability**<br>US based intervention, but some of the findings are transferable in terms of managing any walking intervention. There |

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| **Funding**: NR<br><br>**Quality**: + | | Examination of archive documents such as minutes of meetings, sign-up sheets, monitoring sheets)<br><br>**Data Analysis**:<br>Link with sustainability theory<br>Psychosocial variables that might be associated with club involvement.<br>Interview data analysed by familiarisation, grouping according to 4 main themes, subdivision according to similar statements and ideas.<br>Archival data thematically analysed.<br>Telephone interview data by Content Analysis. | One director stated that he walked the routes with his son and a prospecting wheel.<br>Attendance sheet used to encourage maintenance as well as stimulate conversation between members.<br>Walking sessions included fitness exercises at the start and end.<br>Safety and security was assured by the creation of sub-groups that walk at different speeds. Safety is crucial if walkers experience discomfort, and safety is emphasised when walking at night. There is a rule that at there must be one person walking with each group (slow, moderate, fast walkers).<br><br>2. Organisation<br>More than half of the clubs organised walks outside their neighbourhood at least once a month. To facilitate this, directors must visit the site to verify routes, arrange car sharing and ensure the safety of participants.<br><br>3. Administrative tasks<br>Administrative tasks include organising recruitment campaigns, welcoming new members, organising meetings and motivating attendance.<br>Recruitment campaigns use the following:<br>Newspaper articles and ads; announcement in church newsletters; posters, placards, pamphlets posted in supermarkets, banks, malls, pharmacies and GP practices. Cards are distributed at walking sessions or to homes of former walkers. Sponsored conferences arranged with talks about walking shoes, injuries, etc. The best publicity was reported to be word of mouth.<br>New members received a 'walkers kit' including a sign-up sheet, medical screening questionnaire and walking / fitness information.<br>Gifts are often distributed to aid motivation (T-shirts, booklets etc.), and events organised, such as parties at special occasions. | are useful ways of increasing maintenance and communication within the group.<br>Similarly, the participant views could relate to PA in any setting. |

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| | | | *Advantages for directors (see quotes in all sections)*<br>Positive outcomes for health, endurance, well-being<br>Personal satisfaction from helping others<br>Group motivation<br>Stimulating environment<br>Development of friendships, relationships that encourage confiding and listening<br>Discovering pleasant places to walk<br><br>*Difficulties for directors*<br>Lack of involvement of club members (directors report feeling they have all responsibility); ensuring safety in different subgroups<br>High turnover rate of club participants due to lack of motivation for PA; Lack of knowledge of benefits of walking; low cost and therefore low risk of leaving; lack of effective motivating tools.<br>Directors need to be present at all sessions and have to slow down their own pace of walking.<br>Isolation from other walking clubs – everyone busy managing their own club.<br>Lack of support from community organisations (though support received from Public Health Directorate and employees of municipal leisure office). Difficult to get display of posters approved, for example.<br><br>*Facilitators of maintaining walking clubs*<br>• Development of individual competencies<br>Volunteers provided with training and help to start the club off.<br>Would appreciate being better equipped to manage the clubs.<br><br>• Development of competencies pertaining to group processes<br>Need to have more communication with other groups<br>Learning from the experience of others<br>Developing collective solutions to difficulties | |

| Study details | Population and setting | Methods | Findings | Notes |
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| | | | Pooling energies and walking outside neighbourhood (bank of excursions that could be shared between groups, or simultaneous excursions)<br>• Developing better rootedness in the community<br>Better links regarding obtaining sponsors for gifts<br>Effective recruitment campaigns – regional and ongoing<br><br>*Sustainability*<br>Telephone survey responses elicited reasons why club members either stayed members or, conversely, did not continue their membership. Reasons for staying include:<br>Health:<br>Doing physical activity<br>Getting physically fit<br>Maintaining health<br>Improving health problems<br>Mental health:<br>Staying busy, having an activity<br>Love of walking<br>Getting out of the house<br>Having fun<br>Overcoming depression<br>Walking club:<br>Outdoor activities<br>Accessibility<br>Having walking role models<br>Regular involvement<br>Walking routes<br>Discipline<br>Cost<br>Indoor walks<br>Walking club and its members<br><br>Those that discontinued cited mainly health problems or conflicts with work schedules, or a mismatch between schedules and responsibilities. Other reasons were distance from club, moving out of the area, prefer other activities or walking with other people, life changes, lack of motivation, | |

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| | | | friends dropped out, didn't like the experience. Reasons linked to the club or walking include no service, no atmosphere, costs, sessions not meeting needs, walking pace too fast or too slow, bad weather. | |
| **Author**: Nies<br><br>**Year**: 2006<br><br>**Setting / country**: US<br><br>**Aim of study**: To determine what strategies were most helpful for women to begin and maintain a walking programme.<br><br>**Study design**: Secondary analysis of field notes from an RCT.<br><br>**Funding**: National Institutes of Health National Institute of Nursing research Grant.<br><br>**Quality**: + | **Number and characteristics of participants**:<br>97 women aged 30-60 years and sedentary.<br>50 were African – American.<br>47 were White. | **Intervention aims and content if applicable**:<br>RCT: Telephone counselling intervention to increase women's PA. Trained research assistant called once per week for 8 weeks then every two weeks for 16 weeks. Calls were to explore women's perceptions of PA and barriers to walking 90 mins over 6 days per week.<br><br>**Data collection methods**:<br>Data from RCT.<br><br>**Data Analysis**:<br><br>Pender' Health Promotion Model (HPM), developed to identify and explain factors involved in participating in a health-promoting behaviour.<br><br>Deductive analysis to identify major patterns relating to:<br>• Benefits<br>• Barriers / hassles<br>• Restructuring<br>• Social support<br>• Exercise efficacy<br>• Relapse prevention<br>• Maintenance | **Main Themes relevant to research question**:<br>*Benefits*<br>When women held more perceived benefits than barriers, they were more likely to achieve their goal.<br>Benefits of walking included:<br>• Being physically fit<br>• Reduction of stress<br>• Mental and emotional satisfaction.<br>• 45% stated they had more energy and felt stronger<br>• Increased stamina was also a reported benefit<br>• Weight loss<br>• Decrease in blood pressure<br>• Feeling good, clearing head, mentally relaxing<br>• Feeling rejuvenated and exhilarated<br>• Improved mood<br>• Time to think<br>• Time to be with family and get some fresh air<br>• Peaceful, enjoy the solitude<br>• Getting away from the office<br>*Barriers / hassles*<br>Most times, barriers were not insurmountable. Main barriers:<br>• Personal and professional obligations<br>• Weather<br>• Injuries / illness<br>• Psychosocial, such as depression<br>• Tiredness<br>• Unexpected family problems<br>• Out of town<br>*Restructuring*<br>Ways of overcoming barriers included:<br>• Making time (shorter amounts more frequently; realistic goals ; make most of opportunities, walk | **Limitations identified by author**: NR<br><br>**Evidence gaps and/or recommendations for future research**: Integrate nutritional information into intervention for a holistic approach.<br><br>**Applicability**<br>Though US based, most of the issues discussed could be encountered in any walking programme. Need to consider the impact of being involved in a trial on motivation. |

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| | | | whenever possible; park further away, take stairs)<br>• Problem solving (walking indoors, treadmill, joining fitness centre, if cold or wet outside. Varying locations, time of day, listen to music<br>• Internal / additional motivators (walk with someone, positive thinking).<br>*Social support*<br>Motivation was assisted by walking with someone and / or having support:<br>• Family support<br>• Support of friends<br>• No support / walks alone (time to think; others too slow; wanted a companion but didn't have one)<br>*Exercise efficacy*<br>Positive thinking was useful for many participants. Focus on benefits of walking, or 'I can do this'. Some women found it difficult to think positively because of depression.<br>*Relapse prevention*<br>Three areas:<br>• Committing to goals (get back out there; making plans; prioritise walking)<br>• Problem management (walk with someone, walk in breaks, walk longer at weekends).<br>• Maintaining a positive mental focus (think how good it felt)<br>*Maintenance*<br>Most frequently stated ways of maintaining walking was to get into a routine and integrating into one's lifestyle. | |
| **Author**: Pooley<br><br>**Year**: 2011<br><br>**Setting / country**: UK<br><br>**Aim of study**: To explore | **Number of participants**: One town (Lancaster)<br><br>Car use (55%) and walking (14%) and cycling (4%) a little above national average for travel to work.<br>3749 households | **Intervention aims and content if applicable**:<br>Cycling Demonstration Towns<br><br>**Data collection methods**:<br>Go-alongs (talking whilst travelling (n=10)<br>Static interviews (n=10) | **Survey responses**:<br>88% walk at least once a week<br>2% never walk<br>25% cycled at least once a week<br>48% never cycled<br>Past activity: 18% never cycled<br>33% no chance of ever cycling<br>70% owned a cycle<br>10% no intention of walking regularly | **Limitations identified by author**: NR<br><br>**Evidence gaps and/or recommendations for future research**: Need to assess the |

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| attitudes to and perceptions of walking and cycling.<br><br>**Study design**: Mixed methods.<br><br>**Funding**: EPSRC<br><br>**Quality**: ++ | surveyed (one adult for each).<br>10% response rate to cycling survey and 13% to walking survey.<br>Total n = 437<br><br>Also 20 interviews and 8 ethnographic case studies. | Ethnographic study of 8 households – repeated visits over 3 months included interviews, accompanied journeys, mobility inventories, diaries and observations.<br><br>**Data Analysis**:<br>Qualitative: Atlas ti<br>Comparison and integration of the 3 methods of data collection. | **Main Themes relevant to research question**:<br>Subtly different strategies need to promote walking than cycling.<br><br>For families, walking and cycling is complex, for example if the trip involves the very young, elderly people or those who do not have the ability to walk or cycle. Car use was stated as a necessity to give children a lift or to transport elderly relatives. If it is assumed that these constraints are difficult to change the potential for increasing walking and cycling as transport is substantially reduced.<br><br>Walking for leisure was carried out by some of the people for whom time restraints limited walking for transport. Such activity was more relaxed and enjoyable.<br><br>The survey showed that people generally rejected that poverty was negatively associated with walking and cycling, and a strong sense of autonomy regarding travel mode was expressed.<br><br>However qualitative findings were more mixed; some expressed positive and negative images within the same interview. Ambivalence was therefore evident toward the experiences. Some confident walkers found cycling more problematic, suggesting that the two activities need to be dealt with separately in transport planning.<br><br>Walking could benefit the family by bringing them together as well as being healthy. Owning a dog posed constraints on cycling. One participant was motivated to non car use through potential environmental effects and the expense. However, he felt marginalised as a non-car user ("*like a second class citizen*). Travelling identities were thus reinforced by family, friends, and the wider society. Though both modes are valued for their sense of freedom they are also associated with negative images of risk and image. | nature and extent of changes required that go further than transport policy.<br><br>**Applicability:** Applicable in particular to families as highlights the complexities of transporting young children and elderly relatives. |

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| | | | In addition, bicycles need to be stored and maintained. Having young children requires organisation with belongings, and if outside, appropriate clothing. | |
| **Author**: Ravenscroft<br><br>**Year**: 2002<br><br>**Setting / country**: UK<br>5 trails:<br>Thames Path Newlands Corner, Surrey<br>Bath – Bristol cycleway<br>York Selby cycle way Forest Way, Leicester<br><br>**Aim of study**:<br><br>**Study design**: Focus Groups<br><br>**Funding**: Countryside Agency<br><br>**Quality**: + | **Number and characteristics of participants**:<br>Users of the 5 pathways (physically active and had used the path at least once), and controls (local to the pathways but claimed not to use them). The users had previously been interviewed for a different part of the study. | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>One focus Group for each survey area, including those that had been observed and questioned on the pathways.<br>Three focus groups with controls.<br>Discussions included video-clips of interactions filmed on the routes.<br><br>**Data Analysis**:<br>NR | **Main Themes relevant to research question**:<br>Strong agreement that traffic-free routes are a good thing, especially in urban areas. 'Peace', 'nature' 'quiet' and 'space' were mentioned; there were sightings of wildlife. They offer escape from congestion, noise and pollution. They provide a safe route for activities such as walking and cycling.<br>Support for the concept of shared use; most people enjoyed the diversity and mainly considerate use. People would be friendly.<br>Trade-offs were acknowledged, such as crowding at certain times, and inconsiderate users.<br>More specific anxieties and fears were expressed – comparisons with the past in terms of fear of walking alone at night, especially for women. Towpaths were reported to be poorly lit or unlit, and the amount of cover available for potential intruders or attackers is a concern. Stories of muggings and murders. Some women modify their use, even in the daytime (making sure plenty of people around).<br>Concern for walkers regarding cyclists was compounded by poor light, even in men.<br>There was a view that cyclists don't want walkers and walkers don't want cyclists.<br>There was a low level anxiety regarding gangs of youths hanging out, and even though no negative events were recalled, there was a sense of intimidation.<br>Fear of something happening was expressed on behalf of others (partners, children, women in general).<br>Suspicion and blame are aimed at men on their own, and young people.<br>Where uncertainty has shifted to fear, use has stopped, especially in the dark or alone. This is backed up with TV and newspaper reports of crimes and attacks on the routes.<br>Only one person reported an adverse event - being hit by a biker as he rode past. | **Limitations identified by author**:<br>Small sample (especially controls). Potential bias introduced in focus groups<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability**<br>UK based study, so may be generalisable to other areas, particularly as the study includes 5 paths across the country. Some issues may be specific to particular trails, depending on the environment. |

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| | | | [See discussion for related literature on fear and environment.] | |
| **Author**: Ravenscroft<br><br>**Year**: 2004<br><br>**Setting / country**: UK<br>Three trails (Thames Path; Newlands Corner, Surrey; York-Selby Cycleway, N. Yorks).<br><br>**Aim of study**: To identify discourses of constraint facing those wishing to use non-motorised cycle and walking routes.<br><br>**Study design**: Group interviews<br><br>**Funding**: The Countryside Agency<br><br>**Quality**: + | **Number and characteristics of participants**: Users and non-users of 3 trails. | **Intervention aims and content if applicable**: NA<br><br>**Data collection methods**: 6 Focus groups (2 in relation to each trail – one of 'users' and one of 'non-users').<br><br>**Data Analysis**: Frame: Gidden's Ontological Insecurity (1994; 1998)<br>Beck's Risk society (1992; 1996). | **Main Themes relevant to research question**: *Discourses of Intrapersonal Constraints*<br>Majority of constraints raised buy 'non-users', many of whom described themselves as physically inactive. Relative lack of fitness perceived as inadequate for use of trails. Many were older and may have been active in the past.<br><br>Some considered the trail as incompatible with the motivations for using them (rather use the park). There were reports of people rushing by, and having to get out of the way. In short, the mix of walking and cycling was incongruent. Comparisons are made with other users and other activities, with the implication that the trail is dominated by those wishing to pursue sport-related activities.<br>This demeans the cyclist as apparently inconsiderate, however the speaker admits to standing by for them, accepting their dominance. There were caricatures of the sports cyclist who is young and fast.<br><br>Constraints for jogging or cycling were crowding on Sunday afternoons. Also accident discourses were apparent (e.eg. listening to music and not hearing a cyclist).<br><br>Construction of subject / other in specific 'rural spaces, with cyclists very much the 'other'. In contrast, discourses about 'fellow' walkers involved conversation and being part of nature.<br><br>Another perceived threat to safety for walkers was risk of crime. Although none had direct experience of being threatened or attacked, they relate to media reports. Some stated that they no longer felt like visiting the area that they used to enjoy.<br><br>The author relates these constraints to the 'literacy of fear' (Madge 1997). Many groups felt the need to alter previous | **Limitations identified by author**: NR<br><br>**Evidence gaps and/or recommendations for future research**: NR<br><br>**Applicability**<br>UK based study, so may be generalisable to other areas, particularly as the study includes 3 paths across the country. Some issues may be specific to particular trails, depending on the environment. |

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| | | | behaviour patterns and to compare those patterns with new ones.<br><br>*Interpersonal Constraints*<br>There was also concern about a lack of people on the trail, particularly for those for whom the presence of people meant conferred an enhanced sense of safety ("…*I wouldn't do it now I'm on my own*") or a feeling that they could summon help easily if they had difficulties due to age or health.<br><br>Reflecting Ontological Security, the women feel constrained by a combination of the environment and lack of a walking partner. Some groups referred to dogs as a potential walking partner, particularly large ones that might frighten away potential assailants. Partners may also be required when participating in sports activities, in case of injury.<br><br>*Structural Constraints*<br>Mainly reported by users of trails, as inhibitors to enjoyment:<br>• Physical factors (poor surfaces, lack of rest facilities, lack of car parking close by, barriers to wheelchair access, poor maintenance).<br>• Environmental factors (vegetation on the route, distance between access and exit points, and their distance from connecting routes such as footpaths or roads, the absence of lighting)<br>• Management factors (physical appearance, availability of information and marking, policing and wardening).<br>• Personal factors (time, cost, accessibility).<br><br>Few of these acted as impenetrable barriers but inhibited the types of use that some would like. More serious were concerns were the limitations of linear routes in terms of destinations.<br><br>For recreational walkers the trails were often compared to | |

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| | | | parks which were closer to home and offered more recreational choices. Cyclists however preferred the opportunity to avoid motorised vehicles, though the need to access trails when they are not crowded was important. | |
| **Author**: Ripat<br><br>**Year**: 2010<br><br>**Setting / country**: Canada<br><br>**Aim of study**: To describe a winter walkability project and how an occupational therapist encouraged citizen engagement.<br><br>**Study design**: Participatory Research**.** Focus groups<br><br>**Funding**: Canadian Centre on disability Studies Small Grants program<br><br>**Quality**: + | **Number and characteristics of participants**:<br>1 Citizen<br>9 Senior citizens<br><br>3 male<br>7 female<br><br>All from residential area. | **Intervention aims and content if applicable**:<br>De-icing treatment for sidewalks during winter.<br><br>**Data collection methods**:<br>Focus Groups:<br>• Walking patterns<br>• Perceived challenges to walking during winter<br>• Strategies to overcome the challenges<br><br>**Data Analysis**:<br>Analysis of content informed the acceptability of the walkability project, whilst analysis of interactions informed the citizen engagement experience. | **Main Themes relevant to research question**:<br>*Barriers to walking:*<br>• Advancing age<br>• Physical limitations<br>• Difficulties using assistive devices<br>• Fear of falling and injury<br>• Poor walking conditions (traffic, weather, pavement)<br><br>*Perceived reasons for poor pavement conditions*<br>• Snow clearing practices – some would alter walking practice or stop walking to improve safety. This might lead to social isolation.<br><br>*Perceived effectiveness of De-icing programme*<br>• Majority felt there was no difference between treatment and control sides of the pavement.<br>• All felt that the cost did not warrant continued use through the city.<br>Several alternative measures for snow-clearing to improve conditions were suggested:<br>• Sanding pavements in conjunction with snow ploughing the roads;<br>• lowering blades on snow clearing equipment;<br>• Making snow clearing mandatory for private business owners;<br>• Continuing to plough late into the season;<br>• Removing snow more promptly in areas where more seniors and pedestrians were using the pavements.<br><br>Increased citizen engagement through the project had increased. Previously they had tried to communicate their grievances through e-mail, or phone calls with little effect. | **Limitations identified by author**: Stakeholder engagement in the major writing activities was low. Sustainability was limited to involvement in knowledge translation activities so the asking of new research questions did not occur. Citizens were not asked directly about their citizen engagement experience or followed up.<br><br>**Evidence gaps and/or recommendations for future research**: Explore experience of engagement in participatory research in relation to citizen engagement and any resulting behaviour or attitude changes.<br><br>**Applicability**<br>This study was |

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| | | | There was an identified need for persistence.<br>They indicated both a personal (as frequent walkers) and community (needs of others) level of interest. As such their knowledge was valuable.<br>The experience allowed the citizens to become engaged with debate and more critical of policy. They also developed a deeper understanding of the relevant issues. | carried out in Canada where snow and ice are more common than in the UK. However, walking in winter weather in the UK will present barriers and there may be some useful suggestions to overcome these. |
| **Author**: Shaw<br><br>**Year**: 2011<br><br>**Setting / country**: UK<br><br>**Aim of study**: To explore the feasibility of a community based pedometer study<br><br>**Study design**: Focus Groups<br><br>**Funding**: Scottish Government<br><br>**Quality**: + | **Number and characteristics of participants**:<br><br>Focus Groups:<br>1. Intervention; 4 females , 1 male.<br>2. Control; 4 females , 2 males.<br>3. Intervention; 2 females , 1 male.<br>4. Control; 3 females , 0 males<br><br>6 Research team members | **Intervention aims and content if applicable**:<br>Walking for wellbeing in the West (WWW). Individualised pedometer based intervention. Average 30 minutes consultation with trained member of research team based on transtheoretical model of behaviour change. After 12 weeks another consultation focused on avoiding relapse and maintaining physical activity levels. Advice leaflet at 24 weeks and telephone consultation at 36 weeks.<br>Waiting list control group involving brief consultations (5 minutes).<br><br>**Data collection methods**:<br>Economic evaluation (not reported here)<br>Four focus groups (approx 60 minutes) with participants; 2 with intervention groups and 2 with control groups.<br>Interviews with six members of research team.<br><br>**Data Analysis**: | **Main Themes relevant to research question**:<br>*Support*<br>Two researchers responsible for delivering interventions and co-ordinating assessments, maintaining regular contact with participants for 12-25 months.<br>Participants were positive about the support they received from researchers, and were anxious about wheat to do when this ended.<br>Handing in 'the book' took off the pressure of maintenance and motivation decreased.<br><br>*Monitoring*<br>The step-count provided useful feedback which was supportive and encouraging.<br>Researchers were concerned initially about participant burden, especially measurements of outcomes such as BMI and cholesterol.<br>These measurements turned out to be motivators and part reasons for continuing.<br><br>*Practical issues*<br>Walking was appealing as it was cost-free, could be carried out alone, without generating self-conscious feelings, and could fit into daily routine.<br>Other benefits were social, emotional and physical such as feeling invigorated, seeing sights that were previously unknown to the participant, and talking to people such as | **Limitations identified by author**: NR<br><br>**Evidence gaps and/or recommendations for future research**: Importance of researcher / participant relationship and assessment on motivation. Longer term impact on physical health.<br><br>**Applicability**<br>The intervention is UK based, and also the issues specific to walking are transferable. Need to consider the impact of being involved in an intervention study on motivation. |

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| | | Thematic analysis<br>ATLAS<br>Data from interviews and focus groups analysed together | gardeners in the Botanical Gardens.<br>Barriers included bad weather, boredom for those who tried to walk outside their daily routine.<br>The authors imply that some of the success of the intervention was due to the positive relationship between participants and researchers. | |
| **Author**: Steinbach<br><br>**Year**: 2011<br><br>**Setting / country**: UK<br><br>**Aim of study**: To explore why the meanings of cycling might resonate differently across urban, gendered and ethnic identities.<br><br>**Study design**: Interviews<br>Focus group<br>Case study<br><br>**Funding**: NHS Camden and Transport for London.<br><br>**Quality**: + | **Number and characteristics of participants**:<br>Purposive sampling.<br>78 interviewees | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>Interviews and focus group:<br>• Travel into and around London<br>• Experiences, benefits and disadvantages of different transport modes<br>• Experiences of interactions between road users<br>• Views of different transport mode users<br><br>**Data Analysis**:<br>Constant comparative method<br>Early open coding, development of conceptual coding schemes, iterative approach to data generation and analysis to generate core concepts. | **Main Themes relevant to research question**:<br>*Being a 'cyclist': transport mode as identity*<br>With low rates of cycling in the city, an identity can be pinned on the 'kind of person' that might cycle. The perceived 'strangeness' of cycling meant it was very visible and people could identify themselves as 'cyclist' rather than people who cycle. To signal this identity to others, a style had to be adopted.<br><br>There was talk of an affinity between cyclists. However, in cities that were more cycle friendly and cyclists more prevalent, this identity was not present. Other modes of transport do not have an identity either – one just does it. Nor do other modes require certain clothing – gendered way of cycling. Visibility once out of the cycling club or off the road can be uncomfortable.<br><br>Sometimes the challenge of integrating gendered styles with practical demands (e.g. weather) prohibited the choice of cycling. There was the perception that some women might be more 'blokey' or a 'tomboy' and not be concerned about their appearance after taking off their helmet etc.<br>Blogs have shown resistance to this marginalisation of femininity, with beauty tips and advice on what to wear. One interviewee offers an alternative account ("*I definitely sweat and am proud of it!")* Others combined the exertion with feminine aesthetic and either cycled in heels, or kept a pair at work. This effort was not apparently required for other modes of transport.<br>Reference to Bourdieu who distinguishes between practices that are not remarkable (doxa) from those the kind that has | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability**<br>UK based study, so may be quite specific to cyclists in this country. From the findings it is clear that some areas of the UK are more conducive to cycling than others, where cycling is 'the norm'. Therefore, the 'otherness' of cycling will not be so relevant. |

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| | | | become embodied (Hexis), for example, gendered.<br><br>*The cycling habitus*<br>Cycling also made visible class and ethnicity; associated as it appears to be with the choices of the mainly White middle class, aligned with the bourgeois sensibility of fitness-for-health and ecological health. In other ethnic groups, cycling did not have such associations, and in some religions it is sanctioned for women. For those with less financial resources, the idea of cycling does not align with prosperity For one participant, being poor might mean using a bike rather than a car, and cycling for ethnic groups was positioned as 'fun' for teenagers rather than a mode of transport.<br><br>Conversely, one participant lived in a neighbourhood where cycling is the norm, and so affluence can be expressed ecologically by displaying a 'pimped' bike. This only works where the symbols of status can be read. If few people cycle, cycling had other meanings, such as 'boy gang culture'.<br><br>There was an acknowledged (cultural) lack of Black women cyclists. Those that did cycle were a sub-group that recognised each other on the road. There was a suggestion that Black women need to be encouraged or mentored, as they do not consider cycling as a form of transport.<br><br>Similarly, a group of Asian women laughed at the question "Does anyone here cycle?". A long list of reasons not to cycle followed, such as how to transport children, where to keep a bike if living in a flat, and wearing the jilbab as prohibitive.<br><br>Such barriers could be overcome with policy changes and adaptations (child seats, clothes pegs for holding clothes in decent position). However the women seemed to suggest that cycling was inherently inappropriate. | |

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| | | | *Autonomy and efficiency*<br>Advantages of cycling include relatively quick transportation through busy streets. In addition the participants benefitted from the physical activity and protected the environment. Not having to rely on public transport or a car also gave a sense of autonomy ('freedom' and 'control'). It incorporates fitness into daily routine, whereas trying to fit the gym into daily life can be more difficult.<br>Even those who did not cycle pointed out the benefits. Cycling though rests on mainly being self-transporting without the encumbrance of others.<br>In comparison, the bus allows time for musing and people watching. Walking is less frantic than cycling and still provides exercise as well as opportunities for contemplation and watching street scenes.<br><br>*Maximising and protecting health*<br>Fitness was an incentive for both men and women for taking up cycling, though for men, cycling also provided evidence of physical prowess ("*I generally cycle at or faster than the speed of a car*"). For women cycling was part of a project in shaping the body (skinny legs, not getting fat).<br><br>Cyclists risk not only accidents and embarrassment over clothing, but also vulnerability from the public gaze. There is moral censure of the perceived concern with the environment and fitness. Non-cyclists found this irritating.<br><br>For those considering cycling, risk of injury was particularly salient. For women, perceived aggression on London roads was an issue. Some perceived cyclists to have changed toward aggressive behaviour themselves. Some men saw cycling as competitive. Women mainly did not speak in this way, but tended to relate to their vulnerability to risk, although there was a discourse of empowered gender identity ("*I feel slightly warriorlike*"). Cycling can also be constituted as a resource for constructing self-determining | |

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| | | | identities, as one woman relates that a colleague has a controlling partner who is afraid of her cycling.<br><br>Women then can resist risks from the road and male disapproval. Assertiveness was identified as a style adopted by women that contrasted with both male aggression and female vulnerability. Assertiveness is displayed through deportment on the road and interactions with other broad users. The opposite was cited as lacking confidence and being hesitant, not signalling.<br>This was a skill that needed to be crafted. Moral threats lay in between aggression and assertiveness.<br><br>The authors state that only one health project was unambiguous in its maximisation of cycling: the one that valued future fitness-as-health over immediate safety. This appealed to some identities more than others, particularly professionals who presented themselves as empowered, autonomous and capable of demonstrating immunity from contagious aggression. | |
| **Author**:<br>Stevenson<br><br>**Year**: 1992<br><br>**Setting / country**:<br>Queensland, Australia<br><br>**Aim of study**:<br>To develop strategies for increasing bicycle helmet wearing by children in a rural town.<br><br>**Study design**: | **Number and characteristics of participants**:<br>8 schools.<br>Baseline survey 565 students aged 10-14 years.<br>Workshops 80 students from 6 of the schools.<br>Focus groups. | **Intervention aims and content if applicable**:<br>NA<br><br>**Data collection methods**:<br>Student observations over 2 days of students as they arrived and left school.<br>Survey<br>Focus Groups: Initially to find out knowledge and experience.<br><br>Following a 4-6 week trial of helmet wearing at least 3 times per week to school. Four groups of trialing and non-trialing students.<br><br>**Data Analysis**: | **Main Themes relevant to research question**:<br>Observation: A higher proportion of primary school students wore helmets (40%) than high school students (10%). A greater number of boys than girls were arriving and leaving on cycles, and more boys than girls in all schools wore helmets.<br><br>Survey: 76% of boys and 79% of girls never wore a helmet. Of boys, 47% said they hated them, 24% don't like them but would wear them if they had to, 23% didn't mind wearing them, and 6% liked wearing them. Of girls, the figures were 31%, 27%, 32% and 10% respectively.<br>Of all students, 45% stated that helmets were uncomfortable, though 92% recognised their use in saving lives. 46% stated they were hot and heavy, 45% thought wearing a helmet should be compulsory, 59% thought they look silly and 64% that they are too expensive.<br>When asked to give one barrier to wearing helmets, the main | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability**<br>Australian study so views may differ in UK children. However it appears that helmets are also an issue within the UK therefore suggestions |

| Study details | Population and setting | Methods | Findings | Notes |
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| Action Research<br><br>**Funding**:<br>Road safety Research Grant from Federal Office of Road Safety, Canberra, and the Queensland Health department.<br><br>**Quality**: + | | NR | reason was appearance (47%). Teasing from others was the next highest reason (23%).<br>Suggestions for making cycling safer:<br>Provide cycle paths 95%<br>Teach children safety rules 94%<br>Keep bikes in good repair 96%<br>Design better, cheaper helmets 84%<br>Make other drivers moiré careful about cyclists 89%<br>Have tracks for play and practice 93%<br>Make helmets compulsory 57%<br><br>Workshops: Suggestions that came from the discussions were:<br>• Helmet wearing needs to become trendy<br>• Adults need to set an example<br>• Younger students need to be targeted as too late to encourage older students<br>• Raising awareness of damage that can be done not wearing a helmet through adverts.<br>• Cyclists should be encouraged to wear a helmet all the time<br>• Compulsory wearing, though consider cost for low-income families.<br><br>Focus Groups:<br>• Small accidents were inevitable and acceptable when learning to ride.<br>• Bicycles mostly used as transport to and from school but also for errands and leisure activities.<br>• Paths and tracks useful ways of reducing risk of accidents rather than wearing helmets.<br>• Helmets criticised because of appearance and lack of design – don't fit properly, should be narrower.<br>• Negative criticism of other students was the main barrier to helmet use. Suggestions to make them more like horse riding caps with a chin protector.<br>• Peer led road safety classes and media campaigns | for use may be useful. |

| Study details | Population and setting | Methods | Findings | Notes |
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| | | | using ordinary people rather than celebrities suggested.<br><br>Following helmet trial:<br>Most popular helmet described as comfortable and lightweight.<br>Comments were made about people making fun at first but this got better.<br>More likely to wear the popular helmets if compulsory. | |
| **Author**: Zoellner<br><br>**Year**: 2009<br><br>**Setting / country**: US<br><br>**Aim of study**: To assess the compliance and acceptability of maintaining pedometer diaries for an extensive time frame.<br><br>**Study design**: Focus Groups Interviews<br><br>**Funding**: ARS / USDA cooperative agreement.<br><br>**Quality**: + | **Number and characteristics of participants**:<br>29 African American women.<br>Only gives details of total intervention sample of 75, which also included 5 males.<br><br>7 coaches.<br>All female | **Intervention aims and content if applicable**:<br>6 month community-based walking intervention that included wearing pedometers and maintaining diaries for the duration of the study.<br><br>**Data collection methods**:<br>Three months post-intervention, 5 focus groups held:<br>• Feelings about wearing a pedometer every day<br>• Feelings about completing and handing in logs each week.<br>• Recommended use of pedometers and walking logs.<br>•<br>Each participant received $20.<br>Interviews with coaches.<br><br>**Data Analysis**:<br><br>Systematic content analysis.<br>Coding by 2 independent researchers.<br>Coded by benefits and barriers. | **Main Themes relevant to research question**:<br>Overall, a positive response to wearing a pedometer. This along with keeping a diary was a motivator to walk more. The logs also encouraged competition between groups.<br><br>*Benefits*<br>Wearing a pedometer:<br>• Motivated participants to walk more<br>• Allowed participants to self-monitor their daily steps<br>Completing a log:<br>• Provided confidence and motivation to walk more each week<br>• Was fun to try something new<br>• Promoted a source of competition among groups.<br>Recommend:<br>• Participants would recommend using pedometers and walking logs again.<br><br>*Barriers*<br>Wearing a pedometer:<br>• Participants would forget to wear pedometer<br>Completing a log:<br>• Participants would forget to complete the log | **Limitations identified by author**:<br>The Research Initiative had a strong presence which may have resulted in the provision of more positive responses. The incentive could influence participation.<br>The coaches' role was not explored.<br><br>**Evidence gaps and/or recommendations for future research**:<br>To examine maintenance of pedometer diaries including changes over time. To characterise the relationship between number of steps and changes in anthropometric measures. |

| Study details | Population and setting | Methods | Findings | Notes |
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| | | | | **Applicability**<br>US study though no reason to believe that using a pedometer has vastly different influence on walking in other countries. The study evaluates an intervention, so participants may be more keen to walk and to use a pedometer than the general public. |

## b) Survey studies

| Study details | Population and setting | Methods | Findings | Notes |
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| **Author**: Beck<br><br>**Year**: 2008<br><br>**Setting / country**:<br>US<br><br>**Aim of study**:<br>To identify students' usual mode of travel to school and identify the reasons many students do not walk to school.<br><br>Interviews and secondary analysis of survey data.<br>Funding was not stated.<br><br>**Quality**: + | **Number of participants**:<br><br>9,684 respondents to the survey (response rate 48%), 2,409 of whom had at least one child aged 5-14 years. Of these,<br>135 were excluded from analysis (home schooled [n=56], not enrolled [n=21], other modes of travel [n=44], or missing data<br>[n=14]), leaving 2,274 respondents for the study. | **Methods used:**<br>Data from the Second Injury Control and Risk Survey (ICARIS-2), a nationally representative, random-digit-dialled telephone survey.<br><br>Interviews conducted with one adult per family from July 2001 - February 2003. English and Spanish-speaking households only selected.<br><br>**Data collection:**<br>Variety of injury-related topics, including motor-vehicle safety. Respondents with >1 child (5-14 years) were asked three questions about school travel. One child was randomly selected for whom the questions would apply.<br>The usual mode of travel to school was classified as family car (including carpool), school bus, or walk. Other modes (e.g., train, public transportation, multiple modes, taxi, and bicycle) were excluded because the small number of responses precluded stable estimates.<br><br>Respondents whose child walked to school 4 days per week were asked to identify the primary barrier to walking more often. | **Outcomes:**<br>The most common mode of travel to school was the family car (46.3%), followed by school bus (39.6%), and walking (14.2%). Among those who did not usually walk to school, distance (70.7%) was the most common barrier, followed by traffic danger (9.2%).<br><br>There were no sex differences in usual travel mode. Usual travel mode differed by age group, income, and census region. Children 5-11 years were more likely to ride in the family car than 12-14 year olds, while the opposite pattern was observed for the school bus. Children in households making <$20,000/year were less likely to ride in a family car and more likely to take the school bus than were children in households making $35,000+/year. Barriers to walking to school were examined by sociodemographic characteristics. Because of large relative standard errors, results for income and census region were not presented. No differences were observed by sex. By age group, distance was more commonly cited as a barrier for children 12-14 years (76.6%, 95% CI: 72.5%, 80.6%) than for younger children (68.0%, 95% CI: 64.8%, 71.3%). | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability:**<br>Based on survey of US adults with children aged 5-14 years. Some aspects of transport differ in the US so only partially applicable to the UK. |

| Study details | Population and setting | Methods | Findings | Notes |
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| **Author**: Black<br><br>**Year**: 2001<br><br>**Setting / country**:<br>UK<br><br>**Aim of study**:<br>To consider the problems of eliciting modal transfer from cars, rather than focusing on broad generic elasticity measures.<br><br>**Study design**:<br>Empirical study<br><br>**Funding**:<br>NR | **Number of participants**:<br>NR<br><br>**Characteristics:**<br>Children aged 5 to 10 years.<br><br>The study considers one particular short-trip purpose— the journey to infant school in a compact urban area. | **Methods used:**<br>Conventional attitudinal scaled questions, although questions developed via more formal psychological procedures than usual practice.<br><br>**Questionnaire:**<br><br>**Analysis:**<br>Factor analysis | **Outcomes:**<br>Regressions show that car use on journey-to-school trips can be reduced by a policy which affects parents' mean scores on any of three factors:<br>• Individual responsibility and impact<br>• Environment awareness<br>• Car-centred-ness.<br>This results in a typical-case scenario whose major characteristics are:<br>Age 31–35, female, works part-time, household owns only one car (not a company car), considers there to be a parking problem at the school and lives in a southern county.<br><br>Since each factor contains a different number of questions, interpretation of factor scores is difficult.<br><br>The authors conclude tentatively that modifying attitudes to car-centredness would be a more useful policy than promoting general environmental awareness. | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>The authors did not note any limitations or make recommendations for future research.<br><br>**Applicability:**<br>Applicable in UK to school runs within compact urban areas. |
| **Author**: Cerin<br><br>**Year**: 2010<br><br>**Setting / country**:<br>Australia<br><br>**Aim of study**:<br>To establish the extent to which Australian adults' perceptions of | **Number of participants**:<br>2650<br><br>**Characteristics:**<br>English-speaking residents of private dwellings (aged 20 to 65 years). | **Methods used:**<br>The study used data from the PLACE (Physical Activity in Localities and Community Environments) study.<br><br>**Questionnaire:**<br>Two questionnaires were mailed to the participants including questions about socio-demographic characteristics, perceived | **Outcomes:**<br>Lack of motivation, lack of social support and time constraints were univariately negativity related to weekly MET-minutes of walking for recreation. All barriers, except for bad weather, were univariately associated with higher odds of being a non-participant in recreational walking. Poor health, lack of motivation and lack of facilities the predictive of higher odds, while lack of skills/ knowledge was predictive of | **Limitations identified by author**:<br>Self-reports to assess environmental characteristics and health factors, and a low response rate to the survey.<br><br>**Evidence gaps and/or recommendations for** |

| Study details | Population and setting | Methods | Findings | Notes |
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| barriers to Leisure-Time Physical Activity (LTPA) are explained by individual , social proximal and distal environment factors.<br><br>**Study design**:<br>Survey<br><br>**Funding**:<br>NHMRC program grant.<br><br>**Quality**: + | The overall response rate as a proportion of the total effective sample was 11.5%. | environment, psychosocial correlates of LTPA and health status.<br><br>**Analysis:**<br>Associations between perceived barriers and LTPA. Zero-inflated binomial (ZINB) regression models with robust standard errors accounting for cluster effects were used. | lower odds of being a non-participant in walking. | **future research**:<br>NR<br><br>**Applicability:**<br>Partially applicable to the UK. |
| **Author**: Cleary<br><br>**Year**: 2000<br><br>**Setting / country**:<br>UK<br><br>**Aim of study**:<br>To evaluate the Nottingham Cycle Friendly Employers Project. The objective of the project was to increase the extent to which people cycle for commuting journeys.<br><br>**Study design**:<br>Before and after surveys<br><br>**Funding**:<br>NR<br>**Quality**: + | **Number of participants**:<br>Eight employers introduced a variety of incentives to facilitate cycling among their employees. | **Methods used:**<br>NR<br><br>**Questionnaire:**<br>NR<br><br>**Analysis:**<br>NR | **Outcomes:**<br>Overall cycling awareness and activity were increased by the project, 42% of employees said their cycle commuting had increased. The main influences, about equally, were providing workplace cycling facilities, a house or job move making cycling more attractive, and heightened awareness of the importance of regular exercise for health. The more welcomed and best used measures were, secure cycle parking, showering and changing facilities, and cycle purchase loans. | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability:**<br>May be applicable to cycling initiatives in other UK cities. |

| Study details | Population and setting | Methods | Findings | Notes |
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| **Author**: Dunton<br><br>**Year**: 2006<br><br>**Setting / country**: University in southern California, US<br><br>**Aim of study**: The aims of the study were to 1) examine the structure and measurement properties of the perceived barriers to walking items; 2) determine whether perceived barriers to walking are conceptually distinct from perceived barriers to vigorous activity; and 3) determine whether perceived barriers to walking are related to physical activity criteria.<br><br>**Study design**: Open-ended interviews and focus groups.<br><br>**Funding**: Funding was a National Institute of Mental Health Institutional Training grant.<br><br>**Quality**: + | **Number of participants**: 305 undergraduate students.<br><br>**Characteristics:** Participants had a mean age (± SD) of 20.6 (± 3.02) years and 70.3% were female. | **Research Question:** The study tested the factor structure, reliability, and validity of questions designed to assess perceived barriers to walking for physical activity.<br><br>**Methods used:** Participants responded to a questionnaire assessing barriers specific to walking for physical activity. Walking for transportation and walking for recreation were measured using a 3-Day Physical Activity Recall (3DPAR). Participants recalled their activity for the previous 3 days between 7:00 am and 11:30 pm, segmented into 30-minute intervals. The number of 30-minute intervals of walking for transportation and walking for recreation were counted across the 3 days.<br><br>**Questionnaire:** Perceived barriers were measured through a 16 item instrument; nine items reflect internal barriers such as lack of energy, lack of self-discipline, and feeling stressed, and seven items reflect external barriers such as time constraints and cost.<br><br>**Analysis:** Data screened for violations of statistical assumptions (e.g., normality, linearity) before the | **Outcomes:** On average, participants wore the accelerometer about 14.5 hours on each of the 4 days of monitoring. During this time, they engaged in an average of approximately 29.9 (± 17.1) minutes of moderate-intensity physical activity per day. On the 3DPAR, participants reported an average of 18.2 (± 31.0) minutes of walking for transportation and 8.2 (± 20.0) minutes of walking for recreation per day. In total, 47.4% of participants reported some walking for transportation, and 25.0% of participants reported some walking for recreation during the past 3 days. Among participants, 80.6% usually took the stairs instead of the elevator, 67.8% usually walked short distances instead of driving, 25.0% usually parked away from a destination in order to walk more, 24.3% usually walked during lunch or after dinner, 4.6% usually got off at a bus stop before their destination in order to walk more, and 52.0% usually performed extra walking or stair climbing for exercise.<br><br>In general, the mean ratings for the barriers items were low to moderate (i.e., scores were between 1 and 2 on a 4-point response scale). Lack of time, having a lot to carry, and wearing uncomfortable shoes were rated the highest. Blisters, concern over ruining one's hairstyle, foot pain, and lack of sidewalks were considered to pose the least hindrance to walking for physical activity.<br>Hot weather and cold weather, did not significantly load onto any of the factors. | **Limitations identified by author**: Because of the cross-sectional nature of the study design, the authors could not make any inferences about the causal nature of the relationships between perceived walking barriers and walking for physical activity.<br>It was not possible to tease apart sources of physical activity with the accelerometer. Therefore, moderate physical activity assessed with the accelerometer could include activities other than walking (e.g., gardening, housework).<br>The device is unable to identify the purpose of the activity (i.e., transportation, recreation, or occupation). However, information about walking for transportation and recreation and participation in lifestyle activities reduced some uncertainty about this issue.<br>The ethnic composition of the sample (about 50% Asian-American or Pacific Islander and 20% white) may not reflect |

| Study details | Population and setting | Methods | Findings | Notes |
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| | | analyses. The percentage of accelometer monitoring time spent in moderate-intensity physical activity was positively skewed and was subjected to a square root transformation. Missing data were handled with list-wise deletion for principal components analysis (PCA) and hierarchical regression and pair-wise deletion for all other statistical analyses. | Thus, these two items were removed, and the PCA was rerun. The second iteration of the PCA found that all of the walking barriers items significantly loaded onto one of three factors, which accounted for 61.96% of the variance. The four items clearly loading onto the first factor were barriers related to personal appearance (i.e., perspiring, ruining nice clothing, ruining hairstyle, restrictive clothing). Three perceived barriers pertaining to footwear (i.e., uncomfortable shoes, blisters, foot pain) loaded onto the second factor. The third factor consisted of three situational barriers (i.e., lack, having a lot to carry, and lack of sidewalks). | undergraduate student populations in other areas of the United States.<br><br>**Evidence gaps and/or recommendations for future research**:<br>To test the reliability and validity of the walking barriers measure in middle-aged and older adults.<br><br>**Applicability:**<br>Caution required when generalizing the results to groups of young adults not attending college or to other community samples. College students might have unique lifestyle characteristics (e.g., transportation restrictions, more flexibility in daily routines) and encounter environments (e.g., pedestrian-friendly college campuses) that are not common to working adults. |
| **Author**: Garrard<br><br>**Year**: 2007<br><br>**Setting / country**: Australia<br><br>**Aim of study**: | **Number of participants**:<br>6589 cyclists were observed at the 15 locations.<br><br>**Characteristics:**<br>The cyclists | **Research Question:**<br>To investigate if females are more likely than males to use bicycle facilities with greater separation from motor vehicle traffic for personal travel by bicycle (principally to and from work). | **Outcomes:**<br>Male cyclists outnumbered female cyclists at all locations, with the proportion of female cyclists ranging from 12.2% at the Main Yarra Trail/Gardiner's Creek Trail intersection to 31.7% at the St Georges Road/Charles Street intersection. | **Limitations identified by author**:<br>The 15 locations did not comprise a representative sample of the Melbourne bicycle route network.<br><br>**Evidence gaps and/or** |

| Study details | Population and setting | Methods | Findings | Notes |
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| To assess cycling behaviour (including off-road bicycle paths, on-road lanes and roads with no bicycle facilities) within a 7.4 km radius of the central business district (CBD) of Melbourne, Australia, during peak commuting times.<br><br>**Study design**:<br>Census of cyclists observed at 15 locations<br><br>**Funding**:<br>VicRoads.<br><br>**Quality**: + | comprised 5229 males (79.4%) and 1360 females (20.6%). | **Methods used:**<br>A census of cyclists was conducted at 15 locations (mainly intersections) surrounding the Central Business District (CBD) of Melbourne during morning and afternoon peak commuting times. At each location, counting was conducted for a total of four daylight hours (07:00 to 09:00 h, and 16:30 to 18:30 h). Data were collected on 11 midweek days (5th to 27th of February) when the weather conditions were fine. The 15 locations included many of the most frequently used bicycle and motor vehicle routes (excluding freeways) into the Melbourne CBD, distributed across an approximate 270° arc surrounding the CBD (excluding the Port Phillip Bay area).<br><br>**Questionnaire:**<br>NA<br><br>**Analysis:**<br>SPSS v14.0. Independent t-test and analysis of variance followed by Duncan's multiple comparison were used to test the differences in distance from the GPO between males and females, and between different types of facilities, respectively. Multinomial logistic regression was used to examine the impact of gender on the use of bicycle facilities with differing | The majority of cyclists (2869, 43.5%) were observed using on-road lanes, consistent with the over-representation of these facilities at the 15 locations. The proportion of female cyclists varied according to the type of bicycle facility, suggesting that females preferred to use on-road lanes and roads with no bicycle facilities compared with off-road paths.<br><br>Overall, the mean distance of cyclists from the GPO was 3.81 (SD=1.62) km. Significant differences in distance from the GPO were found for the three types of bicycle facility; post hoc analysis revealed that all of them were different from each other (off-road paths: 5.5(0.82) km; no facility: 3.6(0.88) km; on-road lanes: 2.4 (1.1) km; $p<0.001$). Males were observed cycling at a greater average distance from the GPO than females: 3.91(1.64) km vs 3.43(1.50) km; $p<0.001$.<br><br>Multinomial logistic regression was used to examine the impact of gender on use of bicycle facilities with differing degrees of separation from traffic. After adjustment for distance from the GPO, female cyclists showed a preference for off-road paths over roads with no bicycle facilities (odds ratio [OR] =1.43, 95% confidence interval [CI]: 1.12, 1.83, p=0.004). Similarly, female cyclists preferred off-road paths over on-road lanes (OR=1.34, 95%CI: 1.03, 1.75, p=0.023). On the other hand, the proportions of female and male cyclists using on-road lanes and roads with no bicycle facilities were almost identical after | **recommendations for future research**:<br>To identify and quantify the characteristics of female friendly cycling infrastructure in a range of urban environments. Studies should include observational studies of cycling behaviour, as well as stated preference surveys which allow a larger number of variables to be examined.<br><br>**Applicability:**<br>Cycling policies and facilities may differ in Australian cities from those in the UK. |

| Study details | Population and setting | Methods | Findings | Notes |
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| | | degrees of separation from motor vehicle traffic. | adjustment for distance (OR=1.07, 95% CI: 0.90, 1.27; p=0.46). | |
| **Author**: Mackett<br><br>**Year**: NR<br><br>**Setting / country**:<br>UK<br><br>**Aim of study**:<br>To identify barriers to walking for people with characteristics that make them socially excluded, and to identify policy actions which can help to overcome the barriers.<br><br>**Study design**:<br>Audit<br><br>**Funding**:<br>UK Engineering and Physical Sciences Research Council (EPSRC).<br><br>**Quality**: + | **Number of participants**:<br>NA<br><br>**Characteristics:**<br>NA | **Methods used:**<br>Macro-level data based upon the Local Authority's information system and other sources such as the 2001 Census of Population, street audits, including details such as steps, slopes, access to individual building and obstructions on the pavement.<br><br>**Questionnaire:**<br>NR<br><br>**Analysis:**<br>A GIS database was complied for St Albans using the digital data from the Ordnance Survey Land-Line Plus data as the base.<br><br>Data was collected for the city centre of St. Albans in Hertfordshire. | **Outcomes:**<br>Despite very good levels of access in St. Albans, there were still difficulties moving about. Examples of obstructions were; crossings without dropped kerbs; Footpaths with an effective width of less than 1000 millimetres; a dropped kerb with a gradient of more than 5 degrees.<br><br>The authors reported that 19% of people aged 60+ could not reach any of the key places if they need to pass through a gap of less than 1000 mm. The obstacle that causes the largest obstruction is dropped kerbs with a gradient of over 5 degrees. Over half (56%) of the population would not be able to reach the Old Town Hall in St. Albans if they could not manage dropped kerbs which are steeper than 5 degrees, 94% would not be able to reach the hospital and none of them would be able to reach the station. | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability:**<br>Applicable to older adults within the UK. |
| **Author**: Siderellis<br><br>**Year**: 2010<br><br>**Setting / country**:<br>US<br><br>**Aim of study**:<br>To contribute to the body | **Number of participants**:<br>Users of a mountain biking site that had the existence of a regulated legal trail, a defined public agency managing the site and a single- | **Methods used:**<br>Informal focus groups with Triangle mountain biking participants in the summer of 2006. Data was collected from users with a temporal, on-site random sampling strategy.<br><br>**Questionnaire:** | **Outcomes:**<br>Users preferred sites with higher quality trail conditions and more challenging routes. | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR |

| Study details | Population and setting | Methods | Findings | Notes |
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| of knowledge of biking trail users in preferred trail layouts.<br><br>**Study design**:<br>Case study<br><br>**Funding**:<br>NR<br><br>**Quality**: + | track trail.<br><br>413 respondents and 398 respondents returned useful data.<br><br>**Characteristics:**<br>82% were male and 18% belonged to at least one mountain biking organisation. The mean length of stay was 1.75 hours and they rode 10.3 miles on average. | NA<br><br>**Analysis:**<br>Repeated Mixed Logit analysis. | | **Applicability:**<br>Findings may be applicable to bikers within the UK. |
| **Author**: Soh<br><br>**Year**: 2006<br><br>**Setting / country**:<br>Australia<br><br>**Aim of study**:<br>To investigate exercise patterns of practising anaesthetists and relate these to work and demographic characteristics.<br>To quantify the number of steps walked in atypical working day in anaesthetic practice.<br><br>**Study design**:<br>Survey | **Number of participants**:<br>347<br><br>**Characteristics:**<br>79% were male and 21% female, the median age was 46 years, male respondents were significantly older than females (median 47 vs 43, p= 0.02) | **Methods used:**<br>Thirty consultants at St. Vincent Hospital in Melbourne were recruited to wear a pedometer during working hours for five days. Questionnaires were sent to all ANZCA registered specialist anaesthetists within Victoria at the time of the study (n=584). Within in two months, 360 questionnaires had been returned, giving a response rate of 61.6%. Only 347 (59.4%) were used. As the other 13 respondents were no longer practising anaesthesia.<br><br>**Questionnaire:**<br>NA<br><br>**Analysis:**<br>Nominal data were compared using Fisher's Exact test or Chi | **Outcomes:**<br>Males were more likely to cycle compared to females (28% vs 7%, p= 0.003).<br><br>Of the 30 specialist anaesthetists recruited from St. Vincent's Hospital, the overall median steps per day for the group was 4770 with a $10^{th}$ to $90^{th}$ interpercentile range of 1985 to 8922 and range of 1667 to 9630.<br><br>The main reasons reported for not exercising regularly included fatigue (40%), being too busy (70%), having family commitments (67%) and lack of interest (18%). Women were more likely to cite medical reasons (11.5% vs 1.7%), whilst men were more likely to report being too busy (76% vs 46%). Younger people were more likely to cite family commitments and fatigue as a barrier. | **Limitations identified by author**:<br>It was possible that the non-respondents had a different exercise pattern to the respondents. The limited study size may not reflect the daily working pattern of all anaesthetists.<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability:**<br>Findings may be applicable to the exercise behaviours of anaesthetists within the UK. |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| **Funding**:<br>NR<br><br>**Quality**: + | | Square test. Other data were compared using Mann-Whitney tests. A p value of <0.05 was considered significant. | | |
| **Author**: Wen<br><br>**Year**: 2010<br><br>**Setting / country**:<br>Australia<br><br>**Aim of study**:<br>To promote parents' active travel to work.<br><br>**Study design**:<br>Cross-sectional self-administered survey<br><br>**Funding**:<br>The study was part of the Central Sydney Walk to School Research Program, funded by the NSW Health.<br><br>**Quality**: + | **Number of participants**:<br>The Central Sydney Walk to School Program recruited a total of 2232 students and their parents in the study. The students were aged 10-12 (Year 5 and 6) and were from 24 public schools located in the inner west of Sydney.<br>A total of 1362 parents completed the survey giving a response rate of 61%. In this study, the authors extracted a subset of the data that only included parents/ guardians who were employed and did not work from home (n = 888).<br><br>**Characteristics:**<br>About 80% of respondents were female and two thirds were aged 40 | **Methods used:**<br>A letter of invitation with detailed information about the study and questionnaires were distributed to parents via the participating students. The parent/guardian mostly responsible for getting the child to school was asked to complete the survey. Parent mode of transport was classified by responses to the question 'How do you usually get to work in the morning?' to which responses to 'By car?' were 'No' or 'Yes'.<br><br>**Questionnaire:**<br>The list of questions were:<br>a. My workplace encourages its employees to go to and from work by public transport, cycling and/or walking (active travel)<br>b. I can work flexible working hours at my workplace<br>c. There is convenient public transport close to my workplace<br>d. My workplace has shower and change rooms for its employees<br>e. There is convenient parking near my workplace<br>f. The area where I work has a reputation for being a safe place<br>g. There is convenient public transport close to my home | **Outcomes:**<br>Sixty nine per cent of parents/guardians drove to work. Forty five per cent can work flexible hours and 36% reported their workplace had showers and change rooms. Sixty three per cent of the respondents reported that there was convenient public transport close to work and a similar percentage (66%) also reported there was convenient parking near their workplace. Only about one fifth (19%) reported that their workplace encourages active travel. In addition, 23% of the respondents reported having only one child in the household and 44% had more than one car in the household.<br><br>The respondents who reported that their workplace encourages active travel were significantly less likely to drive to work (49%), compared with those whose workplace did not encourage active travel to work (73%), with an adjusted odds ratio (AOR) of 0.41 (95% CI 0.23-0.73) and an adjusted P = 0.002. Convenient public transport close to work or home is also an important factor that could discourage employees from driving to work with an AOR of 0.17 (95% CI 0.09-0.31), adjusted P < 0.0001 and an AOR of 0.50 (95% CI 0.28-0.90), adjusted P = 0.02 respectively. In contrast, convenient parking near the workplace was positively associated with | **Limitations identified by author**:<br>The proportion of participants driving to work may have been inflated due to the need to drop off or pick up children from school.<br>The authors could not attribute causality, given the cross-sectional nature of the study.<br>Self-reporting could vary widely regardless of facilities offered by the workplace.<br><br>**Evidence gaps and/or recommendations for future research**:<br>NR<br><br>**Applicability:**<br>Applicability could be limited due to the locality of the study area, inner west Sydney, and the study participants in this analysis, a sub-sample of another study.<br>The majority of respondents were female, making it difficult to assess |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| | years and over. Almost half of the respondents (47%) lived more than 10 km from their workplace. | h. The area where I live has a reputation for being a safe place.<br><br>**Analysis:**<br>All analysis was conducted using SPSS (Version 17). To assess the association between these explanatory variables and driving to work, cross-tabulations were used with a continuity corrected chi-square and odds ratio to measure the unadjusted strength of association. Cross-tabulations were also used to assess the associations between demographic variables and car use and to reduce demographic variables to binary form. A ROC curve was used to calculate the optimal cut-off of 'distance of work from home' in predicting driving to work. The unadjusted strength of association between binary demographic variables and driving to work was similarly estimated using cross-tabulations using continuity corrected chi-square values and odds ratios. Binary logistic regression modelling was used to ascertain independent predictors of driving to work. A forwards sequential process was used in which predictor variables were tested in the model in order of their unadjusted association with the outcome variable and only predictors with a P value < 0.1 were retained in the model. Once | driving to work. Compared with those without convenient parking near their workplace, respondents with convenient parking were significantly more likely to drive to work with an AOR of 4.56 (95% CI 2.80-7.43), adjusted P < 0.0001.<br>Other factors including age, language spoken at home and perception of neighbourhood safety have a weaker but significant association with driving to work. In addition, gender, education level and employment status of parent, as well as number of cars and children in the household were not found to be associated with driving to work in this study. | whether this pattern is present across both genders or whether there is a stronger association with one or the other. |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| | | the significant predictor variables were identified, demographic factors were also tested in the model. Adjusted odds ratios (AOR) with 95% confidence intervals were calculated. | | |
| **Author**: Yeung<br><br>**Year**: 2008<br><br>**Setting / country**: Australia<br><br>**Aim of study**: To ascertain the transport practices of children and to identify perceived barriers that may hinder parental decisions regarding their child's use of active transport in commuting to school.<br><br>**Study design**: Self-administered parental questionnaire was used to determine the transport practices of school children and factors that influence parental decisions regarding their child's use of active transport to school.<br><br>**Funding**: | **Number of participants**: Of the 495 parental questionnaires that were distributed, a total of 318 useable surveys were returned, yielding an overall response rate of 64%.<br><br>**Characteristics:** The median age of the children was 9 years (range 4-12), there were 149 boys and 169 girls. | **Research Question:** To ascertain the transport practices of children and to identify perceived barriers that may hinder parental decisions regarding their child's use of active transport in commuting to school.<br><br>**Methods used:** A self-administered questionnaire was distributed to parents of children attending three primary schools within the Brisbane metropolitan district (Queensland, Australia) in which a 'Walk-to-School' program was about to be implemented. Questionnaires were distributed via the school administration to all parents of children attending each school.<br><br>**Questionnaire:** The parental questionnaires gauged the anthropometric characteristics of the oldest child, the mode and distance travelled to and from school, as well as parental perceptions regarding their perceived barriers to walking to school, including safety issues and physical infrastructure. Data | **Outcomes:** Only one-third of children (n = 107) used active transport to travel to- and from-school, despite a median commuting distance of 2.5 km (0.1 km to 28.0 km) for all children. Children using active transport commuted shorter distances (~2 km), were older (by 2 years), taller ( ~4%), heavier (6 kg) and more likely to be male than those using motorised transport. Logistic regression revealed that only commuting distance was significantly associated with increased odds of active transport. | **Limitations identified by author**: Although this study incorporated parental perceptions of factors that influenced their child's transportation mode, it did not incorporate objective measures of the environment to establish their validity. Use of self-reported measures of anthropometry, the relatively poor response rate and the non-randomised nature of the participating schools, which may have lead to a substantial bias. The nature of any such bias could not be established, given the study design and the absence of information on non-respondents.<br><br>**Evidence gaps and/or recommendations for future research**: NR |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| One of the authors (Dr. Wearing) was funded by a Strategic Links with Industry Grant with joint contributions from QUT and MBF.<br><br>**Quality**: + | | were collected over a 3-month period. Response rates were calculated as the proportion of parents issued with a questionnaire that returned the form with useable information on the child's walking habits. No attempt was made to follow up non-respondents.<br><br>**Analysis:**<br>SPSSTM (version 12.01) was used for all statistical procedures. Dependent variables were not normally distributed and, consequently, median values and ranges were used as summary statistics. Mann–Whitney U tests were used to compare the characteristics of children that used active transport at least once a week relative to those that used passive transport modes. Logistic regression was used to assess the independent association between descriptive variables, distance and transportation mode (active vs. passive). | | **Applicability:**<br>Transport practices may differ in Australia to those in the UK. |
| **Author**: Ziviani<br><br>**Year**: 2004<br><br>**Setting / country**:<br>Australia<br><br>**Aim of study**:<br>To examine the extent to which Australian children | **Number of participants**:<br>164<br><br>**Characteristics:**<br>Students in grades 1-7 (mean age 9.1 years, ± 2.02).<br><br>76 boys and 88 girls. | **Methods used:**<br>**Questionnaire:**<br>Survey information was collected using 34 items, which required either a multiple-choice response or a judgement using a rating scale.<br><br>**Analysis:**<br>Descriptive (means and standard | **Outcomes:**<br>The mean number of days walked to school in a week by all the children was 1.00 ± 1.62. With respect to walking home, the mean number of days was 1.16 ± 1.69. There was no statistical difference on the basis of age or gender for either walking to school or home. Only 64 (39%) of the children in the survey ever walked to school. | **Limitations identified by author**:<br>NR<br><br>**Evidence gaps and/or recommendations for future research**:<br>The authors did not note any limitations or make recommendations for |

| Study details | Population and setting | Methods | Findings | Notes |
|---|---|---|---|---|
| walked to and from primary school. And to survey parents to identify factors influencing this behaviour.<br><br>**Study design**:<br>Questionnaire survey<br><br>**Funding**:<br>NR<br><br>**Quality**: + | | deviations) and inferential statistics were calculated using SPSS for Windows version 11.0. Initially Chi square tests were used to determine statistical significance between the proposed barriers and whether or not children walked to school. Logistic regression was then employed to analyse further the dichotomous dependent variable, walking to school. | Psychosocial factors found to impact on whether children walked to or from school (at least once a week) were: parents' perceptions of the importance of physical activity; whether parents themselves had walked to school; whether parents worked; parental concern about children walking without the company of another child; concern about a child's personal safety; and concern about outside commitments (i.e. music lessons, sporting activities). | future research.<br><br>**Applicability:**<br>Some psychosocial factors may be applicable to children travelling to and from school in the UK. |

## 10.2 Appendix 2: Quality assessment criteria and table

### Table of quality grades (qualitative studies)

Quality has been assessed using the CPHE Methods Manual (NICE, 2009) methodology checklist as outlined below.

| | Study | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Quality rating |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ahlport 2008 | 1 | 1 | 1 | 1 | P | 1 | P | 1 | 1 | 1 | 1 | 1 | 1 | NA | 11 / 14 ++ |
| | Bostock 2001 | 1 | 1 | 1 | P | 1 | 1 | 1 | 0 | P | 1 | 0 | 1 | 0 | NA | 8/14 + |
| | Burroughs 2006 | 1 | 1 | 1 | 1 | 1 | 1 | P | P | 1 | 1 | 1 | 1 | 1 | 0 | 11 /14 ++ |
| | Cairns 2010 | 1 | 1 | 1 | 1 | NR | 1 | 1 | 1 | N | 1 | 1 | P | N | NA | 9/14 + |
| | Cavill 2007 | 1 | 1 | 1 | 1 | 1 | 1 | P | 1 | 1 | 1 | 1 | 1 | 1 | P | 12 /14 ++ |
| | Copleton 2009 | 1 | 1 | 1 | P | NR | 1 | P | NR | 1 | NR | 1 | 1 | P | NA | 7/14 + |
| | Darker 2007 | 1 | 1 | P | 1 | 1 | 1 | P | 1 | 1 | 1 | 1 | 1 | 1 | NA | 11 / 14 ++ |
| | Davis 1996 / 2001 | 1 | 1 | 1 | NR | 0 | 1 | 1 | NR | 1 | NR | 1 | P | 0 | NA | 7/14 + |
| | Duncan 1995 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | P | P | 1 | 1 | 1 | 1 | 1 | 12 /14 ++ |
| | Dunn 2008 | 1 | 1 | 1 | 1 | P | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | NA | 9/14 + |
| | Gatersleben 2007 | 1 | 1 | 1 | 1 | N | P | 1 | 1 | N | 1 | 1 | 1 | N | NA | 9/14 + |
| | Gilson 2008 | 1 | 1 | 1 | 1 | 1 | 1 | P | 1 | 1 | 0 | 1 | 1 | 1 | NA | 11 / 14 ++ |
| | Granville 2001 (Unpublished) | 1 | 1 | 1 | NR | 0 | P | 1 | NR | 1 | NR | 1 | 1 | NR | NA | 7/14 + |
| | Granville 2002 (Unpublished) | 1 | 1 | 1 | NR | 0 | P | 1 | NR | 1 | NR | 1 | 1 | NR | NA | 7/14 + |
| | Halden 2003 | 1 | 1 | 1 | NR | 1 | 1 | P | NR | 1 | NR | 1 | 1 | NR | NA | 8/14 + |
| | Hynds 2009 | 1 | 1 | 1 | 1 | P | 1 | P | NR | 1 | NR | 1 | 1 | N | 1 | 9/14 + |
| | Ipsos / MORI | 1 | 1 | 1 | 1 | 0 | 1 | 1 | NR | 1 | NR | 1 | 1 | 0 | NA | 9/14 + |
| | Kirby 2009 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | P | 1 | 1 | 1 | 1 | 1 | 1 | 12 /14 ++ |
| | Lockett 2005 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | P | 1 | 0 | 1 | 1 | 1 | 1 | 12 /14 ++ |
| | Lu 2011 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | P | 1 | 1 | 1 | P | 1 | NA | 11 / 14 ++ |
| | Matthews (Unpublished) | 1 | 1 | P | P | NR | 1 | P | 1 | 1 | 1 | NR | 1 | 0 | NA | 7/14 + |
| | McKenna 2007 | 1 | 1 | 1 | 1 | 1 | 1 | P | 1 | 1 | 1 | 1 | P | 1 | NA | 11 / 14 ++ |
| | Milton 2011 | 1 | 1 | 1 | 1 | P | 1 | 1 | NR | 1 | NR | 1 | 1 | 1 | NA | 10/14 + |
| | Newton | 1 | 1 | NR | NR | 0 | 1 | NR | NR | 1 | NR | 1 | 1 | 0 | NA | 6 / 14 - |
| | Nies 2006 | 1 | 1 | P | 0 | 0 | 1 | P | 1 | P | 0 | 1 | 1 | 1 | 1 | 8/14 + |
| | Nguyen 2005 | 1 | 1 | 1 | 1 | 0 | P | 1 | 1 | P | 1 | 1 | 1 | 1 | 0 | 10/14 + |
| | Pooley 2011 | 1 | 1 | 1 | 1 | P | 1 | 1 | 1 | 1 | 1 | 1 | 1 | N | NA | 11 / 14 ++ |
| | Ravenscroft 2001 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | NR | 1 | NR | 1 | 1 | P | NA | 9/14 + |
| | Ravenscroft 2004 | 1 | 1 | P | 1 | 0 | 1 | P | 1 | 1 | 1 | 1 | 1 | 0 | NA | 9/14 + |
| | Ripat 2010 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | NR | P | 1 | 1 | P | 1 | 1 | 10 / 14 + |
| | Shaw 2011 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | P | 0 | 1 | 1 | 1 | P | 10/14 + |
| | Steinbach 2011 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | P | 1 | 1 | 0 | NA | 9/14 + |
| | Stevenson 1992 | 1 | 1 | 1 | P | 0 | 1 | 1 | NR | P | NR | 1 | 1 | 0 | NA | 7/14 + |
| | Zoellner 2009 | 1 | 1 | 1 | P | P | 1 | 1 | P | P | 1 | 1 | 1 | 1 | NA | 9/14 + |
| | | | | | | | | | | | | | | | | |

NR = Not Reported. NA = Not Applicable. P = Partially reported

**Study quality**

[++]: All or most of the criteria have been fulfilled. Where they have not been fulfilled the conclusions of the study or review are thought very unlikely to alter.

[+]: Some of the criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are through unlikely to affect conclusions.

[-]: Few or no criteria fulfilled. The conclusions of the study are thought likely or very likely to alter.

1. Is a qualitative approach appropriate?
2. Is the study clear in what it seeks to do?
3. How defensible/rigorous is the research methodology?
4. How well was the data collection carried out?
5. Is the role of the researcher clearly described?
6. Is the context clearly described?
7. Were the methods reliable?
8. Is the data analysis sufficiently rigorous?
9. Is the data 'rich'?
10. Is the analysis reliable?
11. Are the findings convincing?
12. Are the findings relevant to the aims of the study?
13. Conclusions

    Is there adequate discussion of any limitations encountered?
14. How clear and coherent is the reporting of ethics?

## Table of quality grades (cross-sectional studies)

Quality has been assessed using an adapted version from Sanderson *et al* (2007).

| | Study | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Quality rating |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Beck 2008** | Y | Y | Y | N | NR | Y | Y | Y | NR | NR | + |
| | **Black 2001** | Y | N | NR | N | NR | Y | Y | Y | N | N | + |
| | **Cerin 2010** | Y | Y | Y | Y | NR | Y | Y | Y | N | Y | + |
| | **Cleary 2000** | Y | NR | NA | NR | NA | Y | Y | NA | NR | Y | + |
| | **Dunton 2006** | Y | N | Y | Y | N | Y | Y | Y | N | N | + |
| | **Garrard 2008** | Y | Y | Y | NA | NR | Y | Y | Y | N | Y | + |
| | **Mackett** | Y | Y | NA | NA | NA | Y | Y | NA | NR | NR | + |
| | **Siderelis 2010** | Y | Y | NR | NA | NR | Y | Y | Y | N | N | + |
| | **Soh 2006** | Y | Y | NR | N | Y | Y | Y | Y | N | N | + |
| | **Wen 2010** | Y | NR | NR | Y | NR | Y | Y | Y | Y | NR | + |
| | **Yeung 2007** | Y | Y | NR | Y | N | Y | Y | Y | N | Y | + |
| | **Ziviani 2004** | Y | Y | NR | N | NR | Y | Y | Y | NR | NR | + |

NR = Not Reported. NA = Not Applicable. P = Partially reported

**Quality Criteria:**

1. Appropriate source population?
2. Appropriate method for selecting study participants?
3. Appropriate inclusion/exclusion criteria?
4. Good response rate? (>60%)
5. Appropriate methods to deal with any design-specific issues such as recall bias, interview bias etc.
6. Appropriate design
7. Appropriate analytical methods
8. Appropriate use of statistics for primary analysis of effect
9. Declaration of conflict?
10. Funding source(s) identified?

## 10.3 Appendix 3: Included studies


Ahlport KN, Linnan L. Vaughn A, Evenson KR, Ward DS. Barriers to and facilitators of walking and bicycling to school: formative results from the non-motorized travel study. *Health Education and Behaviour* 2008; 35 (2): 221-244

Beck LF., Greenspan A I. Why don't more children walk to school? *J Safety Res* 2008; 39 (5) 449-452

Black C, Collins A, Snell M. Encouraging walking: The case of journey-to-school trips in compact urban areas. *Urban Studies* 2001: 38 (7); 1121-1141

Bostock L. Pathways of disadvantage? Walking as a mode of transport among low income mothers. Health and Social Care in the Community 2001; 9 (1): 11-18

Burroughs E. Peck LE, Sharpe PA, Granner ML. Bryant CA. Fields R. Using focus groups in the consumer research phase of a social marketing program to promote moderate-intensity physical activity and walking trail use in Sumter County, South Carolina. *Preventing Chronic Disease* 2006; 3 (1): 1-13

Cairns S., Newson C., Davis A. Understanding successful workplace travel initiatives in the UK. *Transportation Research* Part A 2010: 44; 473-494

Cavill N, Watkins F. An exploratory study of views about cycling in an area of North Liverpool, UK. *Health Education* 2007; 107 (5): 404-420

Cerin E, Leslie E, Sugiyama T, Owen N. Perceived barriers to leisure-time physical activity in adults: An ecological perspective. *J Phys Act and Health* 2010: 7; 451-459

Cleary J, Mcclintock H. The Nottingham Cycle-friendly Employers project: Lessons for encouraging commuting. *Local Environment* 2000: 5 (2); 217-222

Copleton DA. Output that counts: Pedometers, sociability and the contested terrain of older adult fitness walking. *Sociology of Health and Illness* 2010; 32(2): 304-318

Darker C.D, Larkin,M, French D.P. An exploration of walking behaviour- An interpretative phenomenological approach. *Social Science and Medicine* 2007; 10: 2172-2183

Davis A, Jones L, Environmental constraints on health: listening to children's views. *Health Education Journal* 1996; 55 (4): 363-374

Davis A. Getting around: Listening to childrens' views. *Proceedings of the Institution of Civil Engineers.* 2001; 145 (2): 191-194

Derek Halden Consultancy. Children's attitudes to sustainable transport. 2003 Scottish Executive Social Research

Duncan HH. An emergent theoretical model for interventions encouraging physical activity (mall walking) among older adults. *Journal of Applied Gerontology* 1995; 14 (1):64-77

Dunn M. Psychosocial mediators of walking intervention among African American women. *J Transcultural Nursing* 2008 19 (1) 40-46

Dunton GF, Schneider M. Perceived barriers to walking for physical activity. Prev Chron Dis. 2006 Oct. http://www.cdc.gov/pcd/issues/2006/oct/05_0185.htm

Gatersleben B., Appleton KM. Contemplating cycling to work: Attitudes and perceptions in different stages of change. *Transportation Research* Part A 2007: 41; 302-312

Garrard J, Rose G, Lo SK. Promoting transportation cycling for women: The role

of bicycle infrastructure. *Prev Med* 2008: 55-59

Gilson N. McKenna J. Cooke C. Experiences of route and task-based walking in a university community: qualitative perspectives in a randomized control trial. *Journal of Physical Activity and Health* 2008; 5 S176-S182

Granville S, Ralt F, Barber M, Laird A. Sharing road space: Drivers and cyclists as equal road users. Scottish Executive Central Research Unit. 2001

Granville S, Laird A, Barber M, Ralt F. Why do parents drive their children to school? Scottish Executive Central Research Unit. 2002

Hynds H, Allibone C. What motivates people to participate in organised walking activity? Natural England 2009

Ipsos MORI (conducted for Ramblers' Association). Promoting walking in high deprivation communities. 2006.

Kirby J. Active travel to school: views of 10-13 year old schoolchildren in Scotland. Health Education 2009; 109 (2): 169-183

Lockett D. Through seniors' eyes: an exploratory qualitative study to identify environmental barriers to and facilitators of walking. *Canadian J Nursing Research* 2005; 37 (3): 48-65

Lu Z, Rodiek SD, Shepley MM, Duffy M. Influences of physical environment on corridor walking among assisted living residents: Findings from focus group discussions. *J Applied Gerontology* 2011; 30(4): 463-484

Mackett RL. Are we making our children car dependent? Paper written for a lecture at Trinity College Dublin, 2001.

Matthews A., Brennan G., Kelly P., McAdam C., Mutrie N., Foster C. *"Don't wait*

*for them to come to you, you go to them". A qualitative study of recruitment approaches in community based walking programmes in the UK*. Found at: http://www.walk21.com/papers/207_Matthews_Don't%20Wait%20for%20Them%20to%20Come%20to%20You[1].pdf Accessed 14.12.11

McKenna J, Whatling M. Qualitative accounts of urban commuter cycling. *Health Education* 2007; 107 (5): 448-462

Milton K., Kelly P., Bull F., Foster C. A formative evaluation of a family-based walking intervention - Furness Families Walk4Life. *BMC Public Health* 2011; **11:** 614

Newton R, Bright D, Ormerod M, MacLennan H, Mohammad F, Abbas MY. "I really need to get out more": the inclusive (universal) design of streets with older people in mind. University of Salford.

Nguyen M-N Gauvin L Martineau I; Grignon R. Sustainability of the impact of a public health intervention: Lessons learned from the Laval Walking Clubs Experience. *Health Promotion Practice* 2005; 6 (1): 44-52

Nies MA. Motyka CL. Factors Contributing to Women's Ability to Maintain a Walking Program. *Journal of Holistic Nursing* 2006; 24 (1): 7-14

Pooley CG., Horton D., Scheldeman G., Tight M., Jones T., Chisholm A., Harwatt H., Jopson A. Household decision-making for everyday travel: a case study of walking and cycling in Lancaster (UK). *J Transport Geography* 2011: 19; 1601-1607

Ravenscroft N, Uzzell D, Leach R. Danger ahead? The impact of fear of crime on people's recreational use of nonmotorised shared-use routes. *Environment and Planning C: Government and Policy* 2002; 20: 741-756

Ravenscroft N. Tales from the Tracks: Discourses of Constraint in the Use of

Mixed Cycle and Walking Routes. International Review for the *Sociology of sport.* 2004; 39 (1): 27-44

Ripat JD, Redmond JD. Grabowecky BR. The Winter Walkability project: Occupational therapists' role in promoting citizen engagement. *Canadian J Occupational Therapy* 2010; 77 (1): 7-14

Shaw R, Fenwick E, Baker G, McAdam C, Fitzsimons C, Mutrie N. 'Pedometers cost buttons': the feasibility of implementing a pedometer based walking programme within the community. *BMC Public Health* 2011; 11: 200

Siderelis C, Naber M, Leung Y-F. The influence of site design and resource conditions on outdoor recreation demand: A mountain biking case study. *J Leis Res* 2010: 42 (4); 573-590

Soh M, Deam RK, Kluger R. 10,000 reasons to step out – exercise patterns and pedometer evaluation of consultant anaesthetists. *Anaesth Intensive Care* 2006: 34; 347-352

Steinbach R, Green J, Datta J, Edwards P. Cycling and the city: A case study of how gendered, ethnic and class identities can shape healthy transport choices. *Social Science and Medicine* 2011; 72 (7): 1123-30

Stevenson T, Lennie J. Empowering school students in developing strategies to increase bicycle helmet wearing. *Health Education Research* 1992; 7 (4): 555-6

Wen LM, Kite J, Rissel, C. Is there a role for workplaces in reducing employees' driving to work? Findings from a cross-sectional survey from inner-west Sydney, Australia. *BMC Public Health* 2010: 10; 50

YeungJ, Wearing S, Hills AP. Child transport practices and perceived barriers in active commuting to school. *Transportation research Part A 42* 2008: 895-900

Ziviani J, Scott J, Wadley D. Walking to school: Incidental physical activity in the daily occupations of Australian children. *Occ Therapy Int* 2004: 11 (1) 1-11

Zoellner J, Powers A, Avis-Williams A, Ndirangu M, Strickland E, Yadrick K. Compliance and acceptability of maintaining a 6-month pedometer diary in a rural, African American community-based walking intervention. J *Physical activity and Health* 2009; 6 (4): 475-482

## 10.4 Appendix 4: Excluded studies

| Author, date | Reason |
|---|---|
| 'Finding New Solutions' cycling intervention | Description only |
| Adams | Review |
| Ball et al 2007 | Correlates<br>Environment |
| Bennett 2011 | Editorial |
| Berry 2006 | ? Effectiveness |
| Bird 2004 | Description only |
| Braun 2002 | Commentary |
| Caperchione 2010 | Description |
| Carnall 2000 | Commentary |
| Crone 2007 | Clinical population |
| Dawson et al 2006 | Not enough relevant data |
| Ekkekakis et al 2008 | Background |
| Green 2009 | Background |
| Hine 1996 | Focus on traffic |
| Huberty 2009 | Description |
| Jones 2000 | Background – data in other papers |
| Jones1998 | No mention of walking or cycling |
| Katrien 2007 | ? Needs to be in effectiveness review |
| Lovelace 2011 | Modelling energy consumption in Sheffield |
| Lyden 2003 | Infrastructure |
| MacDonald 2009 | No mention of walking or cycling |
| Maibach 2009 | Commentary paper |
| Miller 2010 | Protocol only; no findings |
| Morrency et al 2009 | Background |
| Moser, G., Bamberg 2008 | Review |
| Ogilvie et al 2008 | Correlates |
| Ogilvie 2010 | Infrastructure |
| Peel 2010 | Clinical population |
| Pilkington 2009 | Commentary paper |
| Pooley et al 2010 | Infrastructure |
| Pucher, 2010. | Review |
| Reynolds | Description |
| Ryley, T. 2006 | No new relevant data |
| Sirard 2008 | Commentary |
| Spong 2000 | Commentary |
| Staunton 2003 | Commentary only |
| Troped et al 2003 | Correlates |
| Tudor-Locke 2002 | Prevalence of physical activity |
| Wardman et al 2007 | Model formation |
| Werner, R., Evans, G. 2007 | Background |
| Wojtowicz 1996 | Hazard surveillance |

## 10.5 Appendix 5: Search Strategies and Details of Evidence Sources

**Databases searched:**

Medline and Medline in Process via OVID SP

CINAHL via EBSCO

Sociological Abstracts via Proquest

Embase via OVID SP

ASSIA via Proquest

British Nursing Index and Archive via OVID SP

Cochrane Library databases (Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials, Database of Abstracts of Reviews of Effects, Health Technology Assessment Database, NHS Economic Evaluation Database) via Wiley

Science Citation Index via Thomson ISI

Social Science Citation Index via Thomson ISI

PsycINFO via OVID SP

The Transport Database via OVID SP

Social Policy and Practice via OVID SP

EPPI Centre Databases – Bibliomap, Database of Promoting Health Effectiveness Reviews (DoPHER), Trials Register of Promoting Health Interventions (TRoPHI), The database on Obesity and Sedentary behaviour studies

http://eppi.ioe.ac.uk/cms/

**Websites**

Department for Transport

www.dft.gov.uk/

Transport Research Laboratory

www.trl.co.uk/

Institute for Road Safety Research (SWOV)

http://www.swov.nl/index_uk.htm

**Initial Search**

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Database: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations
and Ovid MEDLINE(R) <1948 to Present>
Search Strategy:
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1     Bicycling/ or walking/ (19931)
2     (walk$ or bike$ or bicycl$ or biking).ti. (16777)
3     Travel/ or transportation/mt (17205)
4     (active transport or travel mode or active travel or travelling
actively or multimodal transport or active commute or green commute
or green transport or green travel or ecological commute or
ecological transport or ecological travel or non-motori#ed or auto or
environmentally friendly transport or travel behavio?r or carbon
neutral transport).ti. (6184)
5     1 or 2 or 3 or 4 (53622)
6     Health promotion/mt (8996)
7     *Health behavior/ (12982)
8     (health behavio?r or health education or health promotion).ti.
(14386)
9     *Recreation/ (2189)
10     6 or 7 or 8 or 9 (35689)
11     5 and 10 (688)
12     ((recreation* or leisure or intervention or interventions or
inform* or educat* or promot* or encourage*or advice or advis* or
uptake or increas* or adhere* or aware* or encourage* or facilitat*
or habit or impact* or pattern* or program* or campaign* or project
or activit* or initiative* or scheme or start*) adj5 (Walk* or bike*
or bicycl* or biking or active travel or active commut* or modal
shift* or pedestrian* or non-motori?ed)).ti. (1317)
13     11 or 12 (1903)
14     limit 13 to (english language and humans and yr="1990 -
Current") (1395)
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Focussed Search (Barriers and Facilitators) conducted in Cinahl, Medline and Medline in Process, Science and Social Science Citation Indices, The Transport database and Social Policy and Practice.

Database: Cinahl

1. TI ( policy maker* or coach* or provider* or barrier* or motivation* or benefit* or facilitat* or community-based or environment* or intrapersonal or interpersonal or social support or psychological benefit* or perception* or constrain* or view* or social integration or psychosocial or inhibit* or individual or light* or safe* or traffic or stranger danger or theft or storage or shower* or road traffic accident or social marketing or companion* or identif* or road danger or aggress* or seniors or park* or hazard* or traffic or implement* or workplace or work or cultur* or subcultur* or citizen* or winter or snow or pavement* or sidewalk* or road* or socio-political or laval walking or satisfaction or sustainability or competenc* or group dynamic* or mall walking or sociali?ation or belonging or safe* or interaction* or social or fear* or block* or obstacle*or hinder* or attitude* or opinion* or belief* or perceiv* or aware* or motivation* or reason* or incentiv*) OR AB(policy maker* or coach* or provider* or barrier* or motivation* or benefit* or facilitat* or community-based or environment* or intrapersonal or interpersonal or

social support or psychological benefit* or perception* or constrain* or view* or social integration or psychosocial or inhibit* or individual or light* or safe* or traffic or stranger danger or theft or storage or shower* or road traffic accident or social marketing or companion* or identif* or road danger or aggress* or seniors or park* or hazard* or traffic or implement* or workplace or work or cultur* or subcultur*or citizen* or winter or snow or pavement* or sidewalk* or road* or socio-political or laval walking or satisfaction or sustainability or competenc* or group dynamic* or mall walking or sociali?ation or belonging or safe* or interaction* or social or fear* or block* or obstacle* or hinder* or attitude* or opinion* or belief* or perceiv* or aware* or motivation* or reason* or incentiv* )

2. (MM "Attitude of Health Personnel")
3. (MM "Time")
4. (MM "Commitment")
5. (MM "Motivation")
6. (MM "Attitude")
7. (MM "Weather")
8. OR/1-7
9. (MM "Cycling")
10. (MM "Walking")
11. TI walk* or bike* or bicycl* or biking
12. (MH "Transportation/MT")
13. TI active transport or travel mode or active travel or travelling actively or multimodal transport or active commute or green commute or green transport or green travel or ecological commute or ecological transport or ecological travel or non-motori?ed or environmentally friendly transport or travel behavio#r or carbon neutral transport
14. OR/9-13
15. TI (case stud* or qualitative or focus group* or field study or field studies or ethnograph* or grounded theory or action research or phenomenol* or life stor* or participant observation or cooperative inquiry or narrative analys?s or discourse analys?s or discurs* analys?s or content analysis or thematic analysis or lived experience* or life experience* or purposive sampl* or criterion sampl* or constant comparison or interview*) OR AB (case stud* or qualitative or focus group* or field study or field studies or ethnograph* or grounded theory or action research or phenomenol* or life stor* or participant observation or cooperative inquiry or narrative analys?s or discourse analys?s or discurs* analys?s or content analysis or thematic analysis or lived experience* or life experience* or purposive sampl* or criterion sampl* or constant comparison or interview*)
16. (MH "Interviews+")
17. (MH "Qualitative Studies+")
18. OR/15-17
19. 8 AND 14 AND 18
20. Limiters - Published Date from: 19900101-20111231; English Language; Human