

Understanding the mechanisms by which residential relocation affects changes in cycling: A theory-building process tracing approach

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ABSTRACT

Introduction: Promoting cycling for both transport and leisure is a policy priority recognized for its potential to improve health. Life events, such as residential relocation, often trigger behavioural shifts in cycling. However, the complex mechanisms and interplay of factors influencing these changes remain not well understood.

Methods: This qualitative study explores the impact of relocation on cycling, using a novel theory-building process tracing approach to re-analyse 28 in-depth interviews conducted between 2008 and 2011 as part of the Cycling Cities and Towns (CCT) project in England.

Results: Three mechanisms are identified linking relocation to changes in cycling behaviour: physical changes, social changes, and intentions. Most (male) participants responded to physical changes in the environment. Reassessment of these changes was common among those who increased cycling but not among those who reduced it. The study also highlights the important role of social changes in influencing cycling behaviour post-relocation and reveals gender differences in how these social shifts influence behaviour.

Conclusion: Relocation presents a significant opportunity for behaviour change, capable of leading to both increases and decreases in cycling through various mechanisms and contextual conditions. This study challenges the overemphasis on self-selection bias and underscores the importance of physical and social changes in shaping cycling behaviour post-relocation. These insights highlight the need for comprehensive theories, innovative methods, and interventions that account for the complexity of different movers and their cycling decisions.

1. Introduction

Cycling is commonly utilised for transport and leisure, offering numerous advantages for individuals and communities. As a mode of transportation, it reduces traffic congestion, lowers air pollution, and mitigates the adverse effects of climate change (Banister, 2007; Department for Transport, 2011; Pucher and Buehler, 2010; Woodcock et al., 2009). As a leisure activity, it is a relatively cost-effective means of exercise, offering opportunities to enjoy the outdoors and build social connections. Both promote physical activity, which is essential for maintaining good health (World Health Organizations, 2020). Despite these benefits, cycling rates for transport and leisure show contrasting trends globally, while some countries show increases, there remain

many with low and declining rates of cycling (Department for Transport, 2023; World bank, 2017).

Decisions to cycle can be influenced by a multitude of factors, including individual, societal, and environmental characteristics (Fraser and Lock, 2011; García et al., 2019; Yang et al., 2019). Additionally, both transport and leisure cycling are commonly conceptualised as habitual and needing a ‘trigger’ before changing (B. Clark et al., 2016). Habit discontinuity theory suggests that this could happen through life events that cause a disruption to routines leading to a window of deliberate (re-) consideration of behaviour, often referred to as ‘window of opportunity’ (Verplanken et al., 2008). Life events associated with such a modal shift include getting married, having a first child, changes in employment or income, or residential relocation, as well as transport

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specific events such as acquiring a driving license or car (Janke et al., 2021; Oakil et al., 2011; Whittle et al., 2022).

Residential relocation is a unique life event for interrupting individuals' habits and placing them within a new environment, both of which are associated with changes in cycling behaviour. Accordingly, studies find shifts in mode choice, travel distance, and travel time following residential relocation (De Vos et al., 2018; Ding et al., 2018; Scheiner and Holz-Rau, 2013; Tao et al., 2023; Zarabi et al., 2019). Next to habit discontinuity, a predominant explanatory theory for these behavioural changes is residential self-selection which attributes changes to predefined intentions that influence location choice and subsequent behaviours (X. (Jason) Cao et al., 2009; Guan et al., 2020; Van Acker et al., 2010). However, this explanation has been criticised for being too simplistic (Chatman, 2009; Kroesen, 2019; Næss, 2014), particularly for disregarding the influence of changing environmental conditions (X. (Jason) Cao et al., 2009). To understand what may cause behaviour to change post-relocation, several quantitative studies have identified moderating and mediating factors on these associations, including moving distance, co-occurring life events, age, and environmental attitudes (Bamberg, 2006; He and Wu, 2020; Tao et al., 2023; Zhao and Zhang, 2018). Yet, to date, the exact process and intricate interplay of factors influencing behaviour changes after relocation remain not well understood.

Process Tracing, originating from political science, offers a method to unpack the intricacies of behaviour change by unveiling the mechanisms and intermediate steps linking causes to outcomes within individual cases. It examines not only whether changes occur but how. While commonly used deductively for testing existing theories through Bayesian hypothesis tests, an inductive approach allows for theory-building from evidence (Beach and Pedersen, 2019). In the absence of an all-encompassing theory for understanding cycling post-relocation, theory-building process tracing provides a suitable method to investigate the mechanisms of change without being constrained by potentially incomplete theoretical lenses. In this context, the inductive approach may be considered abductive, as it involves using pieces of evidence or explanations from observations to find the most likely explanations.

This qualitative study examines how individuals alter their cycling behaviour following residential relocation. From 144 interviews conducted in the Cycling Cities and Towns (CCTs) project in England, we selected 28 transcripts detailing instances of relocation for a secondary analysis. While the primary analysis established the existence of links between relocation and changes in cycling behaviour (Chatterjee et al., 2013; Ferguson, 2017), our focus was on exploring the nuanced mechanisms underlying such changes. Employing a theory-building process tracing approach, we systematically analysed the causal factors influencing post-relocation decision-making processes, aiming to enhance current understandings of relocation effects on behaviour. By unravelling these processes, we aimed to illuminate the 'black box' of behaviour change for transport and leisure cycling, and inform policy and theory. This included updating assumptions about movers' attitudes and decision-making, such as the existence and magnitude of residential self-selection bias.

2. Methods

2.1. Data

Between 2008 and 2011, twelve CCTs in England – Blackpool, Bristol, Cambridge, Chester, Colchester, Leighton Buzzard, Shrewsbury, Southend, Southport, Stoke-on-Trent, Woking, and York – received substantial investment to deliver programmes and interventions that aimed to improve the opportunities for cycling (Department for Transport, 2012). These included the development of dedicated cycling lanes, provision of cycling training, and better access to bike storage facilities. Towards the end of the programme period (2010/2011), a purposive sample of CCT residents was interviewed to explore changes in their

cycling behaviour. The face-to-face interviews were conducted to understand the circumstances in which cycling behaviour changes, including triggers, barriers, and contextual factors. Alongside the interviews, detailed travel diaries and a three-year timeline of important life events were completed. Interview transcripts are publicly available through the UK Data Service (Data Collection: Chatterjee, 2016) and were released alongside respondents' demographic information.

Although the interviews are not very recent and some societal and technological changes have occurred since the data collection, the analysis focused on how people make decisions related to cycling rather than contemporary levels or trends. The underlying mechanisms of behaviour change—such as household dynamics, environmental evaluations, and the role of intentions—are unlikely to have changed significantly over the last 20 years. Accordingly, studies conducted across a wide range of timeframes, including Döring et al. ((2019), using 1980–2006 data), Scheiner and Holz-Rau ((2013), using 2002–2003 data), Clark et al. ((2014), using 2009–2011 data), and Zhao and Zhang ((2018), using 2017 data, have consistently reported reductions in car travel after urban relocations and, importantly, drawn similar conclusions about the mechanisms driving these changes.

Out of 428 residents contacted by telephone following a baseline survey, 144 (12 from each area) agreed to participate (J. Christiansen et al., 2012). Participants were adults over the age of 16 who indicated that they had no disability or longstanding health problems. The sample was specifically designed to focus on individuals who had altered their cycling patterns and thus includes more cyclists than typical and is not representative of the general population. For our study, sampling individuals who altered their cycling patterns was appropriate because, although some scholars caution against selecting on the dependent variable, the presence of cycling change was necessary for us to examine the mechanisms behind it (Beach and Pedersen, 2018).

As all participants lived in areas that had undergone improvements through the CCT project, the findings from this study may be specific to areas with a baseline level of cycling infrastructure or recent upgrades, potentially limiting their generalizability to regions without similar investments. However, as the analysis aimed to identify which factors, including those linked to the investments, were most influential in determining changes in cycling behaviour, it should be possible to distinguishing between changes that were primarily driven by new cycling opportunities and those that were less dependent on such improvements.

2.2. Residential relocation

The interviews were semi-structured, adhering to an interview guide (Chatterjee and Marsh, 2010) that outlined key topic areas without imposing a rigid script. For the three-year timeline of participants' travel behaviours and life events, interviews included questions on relocation like "How long have you lived here?" or "Have you been here for three years?". The former elicited more detailed information on relocation, such as the month and previous location, while the latter often resulted in a simple "yes/no" response. Some interviews further explored relocation responses; others did not.

This retrospective account relied on participants' recall of their residential relocations, introducing the possibility of recall bias. However, focusing only on relocations that participants could clearly recall and connect with their cycling behaviour was necessary for the construction of the desired mechanisms. While some movers who did not mention or remember their move might have been excluded, it is likely that these individuals were less influenced by the move and thus would have contributed little to the mechanisms. Importantly, this study did not aim to estimate how often a move leads to a change in cycling. Had this been the goal, the missed moves could have led to an overestimation of the effect.

2.3. Change in cycling behaviour

For this study, change in cycling behaviour referred to a sustained adjustment in frequency or duration of cycling. Isolated or transient instances of experimenting with alternative modes were not considered to reflect a change in behaviour. That being said, we did not apply a strict definition and investigated the meaning of changes in each individual case, acknowledging that behaviour change exists along a spectrum rather than as a binary outcome.

2.4. The sample

Out of the 144 participants interviewed, 28 discussed instances of residential relocation. 20 of them subsequently changed their leisure or transport cycling – the “typical” cases and main sample of this analysis. The sample consisted of 12 men and 8 women, with women being slightly more represented in the younger age groups (20–24 and 25–44). They came from 11 cities or towns (no participants met the criteria from Colchester). With an average time since move of approximately 2.8 years, most participants had relocated within the last 2 years. However, one individual (Southend 4) described their experiences following a move that occurred 12 years ago. To compare and validate our findings from this sample, we also explored experiences from the eight participants who moved but did not change their behaviour.

2.5. Analysis

We used theory-building process tracing to identify and interrogate the steps linking residential relocation and changes in cycling to infer plausible causal mechanisms. A causal mechanism was understood as a system of interconnected parts, where actions interact and link together to form a cohesive process contributing to the outcome (Bennett, 2007; Glennan, 1996). Causal mechanisms were understood to have different empirical manifestations in different cases.

While it is mentioned as a possibility in the literature, the inductive theory- building variant of process- tracing is surprisingly rare (Beach and Pedersen, 2019). With limited methodological precedents to follow, we adapted the theoretical advice from Camacho Garland and Beach (2023), Beach (2021), and Beach and Pedersen (2019) to systematically construct mechanisms from the data. Camacho Garland et al. (2025) provided additional insights specifically on applying process tracing to interview data. The process involved several stages of data organization, analysis, and refinement. Below, we provide a detailed account of our analytical process to enhance transparency and offer guidance for future researchers interested in applying this approach.

2.5.1. Initial data organization

An initial skimming of all interview transcripts was conducted without predefined categories or themes, highlighting potentially relevant points and making open-ended notes. During this stage, all instances where participants described residential relocation were identified. To ensure completeness, a second round of skimming was performed to verify that no movers were overlooked. A table was then compiled, listing all individuals who had relocated, integrating descriptive information from the interviews and supplementing it with details such as the timing of their move and the locations they moved from and to.

2.5.2. Detailed case analysis and timeline construction

An in-depth reading of all transcripts from participants who had relocated was undertaken, systematically documenting each step relevant to their cycling behaviour before, during, and after the move, as well as the involved actors and their actions. Contextual factors such as life events (e.g., having a child, acquiring a pet) and personal characteristics (e.g., self-identification as environmentally conscious) were also noted.

Following a process similar to sequence analysis, these events were structured into detailed individual timelines that captured the different steps of the behavioural change process. We termed these steps “building blocks” and organized them into a chain of binding parts, where each activity was linked to the next. As additional cases were analysed, new timelines were compared iteratively with existing ones, aligning similar building blocks to maintain consistency and comparability across cases. Recurring patterns were noted, and initial tagging of emerging behavioural trajectories was conducted.

Cases where cycling behaviour did not change or changed only temporarily were also identified. These were designated as “breakdown” cases to uncover contextual conditions or additional causal factors necessary for the process to occur (Mahoney and Goertz, 2004).

2.5.3. Pattern identification and grouping

Once all individual timelines were created, common patterns and recurring sequences of building blocks were identified (Braun and Clarke, 2006). This initial analysis was conducted independently, followed by multiple workshops with co-authors to refine themes and validate their consistency across cases.

During these workshops, timelines were systematically reviewed and grouped based on similarities, applying techniques akin to case clustering and axial coding (Strauss and Corbin, 1998). Underpinning interview quotes and participant profiles were compared within each group to ensure to ensure internal consistency and to confirm that the cases were meaningfully similar. Alternative explanations were also critically examined, considering (a) other influences beyond relocation and (b) whether any timelines might fit better in a different group.

At this stage, we also evaluated whether these groupings could be abstracted into broader, generalizable mechanisms that provided a coherent explanation, and whether they were distinct enough to warrant separate classification.

2.5.4. Validation and mechanism development

To enhance the robustness of the findings, a second review of the timelines was conducted to assess whether initial groupings remained consistent or if alternative patterns emerged.

To transition from these groups of timelines to fully developed causal mechanisms, building blocks were refined and simplified to represent generalized processual pathways rather than case-specific narratives, while still capturing all necessary steps for the mechanisms to take effect.

Lastly, the developed mechanisms were systematically compared against breakdown/deviant cases to examine whether any critical steps were missing for these individuals and whether additional contextual factors prevented cycling behaviour change. This final step verified the completeness of the mechanisms while identifying the contextual conditions and supplementary factors necessary for their operation (Beach, 2021).

A detailed overview of all mechanisms, supporting evidence from the interviews, and possible alternative explanations is provided in the Appendix.

3. Results

We identified three distinct mechanisms through which residential relocation affected leisure and transport cycling. The first mechanism appeared through changes in the physical environment, including changes in distance, topography, traffic, and access to transport options (*Physical Environment Mechanism*). The majority of participants followed this mechanism ($n = 13$). The second mechanism was driven by alterations in the social environment, predominantly those in the household (*Social Environment Mechanism*). The third mechanism involved acting upon intentions and wishes for being more active and/or cycling more (*Intentions Mechanism*). One individual consistently stated both physical and social changes in their justification and was assigned to both those

mechanisms.

Shared contextual factors and individual characteristics across the different mechanisms suggested plausible determinants for each. Participants influenced by the *Physical Environment Mechanism* were predominantly male and younger, many did not cycle before relocating. The *Social Environment Mechanism* showed gender differences: women were more influenced by proximity to social contacts, while men reported shifts in priorities. Those following the *Intentions Mechanism* were mostly female and experienced significant changes in their environment through the move. Their environmental or health consciousness was similar to those following other mechanisms.

All mechanisms influenced leisure and transport cycling. While the *Intentions Mechanism* exclusively led to increases in cycling, the other mechanisms could result in either increases or decreases. In our sample, movers were more likely to increase bicycle use, contrary to existing literature (B. Clark et al., 2016; Gerber et al., 2017). This was likely due to the purposive sampling.

Across all mechanisms, the experience of positive factors, such as enjoyment of cycling, acquiring better bicycles, and gaining confidence in cycling abilities, appeared important to strengthen decisions and commitment after initial increases in cycling. Conversely, the absence of such reinforcing factors often resulted in unsuccessful or short-lived changes in cycling behaviour. Other reasons for moving not leading to changes in cycling were if components of the mechanism were missing or if external factors, such as sustaining injuries after initiating cycling, counteracted the process.

3.1. Physical environment mechanism

The first mechanism operated through significant changes in the physical environment that prompted participants to reassess the experience and utility of leisure and transport cycling (Fig. 1). These environmental changes varied among participants but often included the distance to common destinations (such as the workplace or family members), topography, traffic, access to bike storage, or the price and quality of alternative modes. This aligns with studies highlighting density, distance, walkability, and safety as important factors in influencing physical activity and cycling after relocation (Beenackers et al., 2012; B. Clark et al., 2016; Giles-Corti et al., 2013; Kärmeniemi et al., 2019; McCormack et al., 2017). The environmental assessment in this

mechanism led to one of two conclusions: either the environment was deemed suitable for cycling with evident benefits over alternatives, or cycling was perceived as less advantageous or enjoyable. This was despite all movers having located to areas that were part of the CCT project and had received improvements in their cycling infrastructure and opportunities.

Similar mechanisms were reported by Garrott et al. (2024) exploring context changes that influence travel mode choice. In cases where cycling was deemed less favourable and subsequently declined, additional factors, such as a lack of motivation, sometimes also contributed to this outcome. For some participants the evaluation occurred through using and exploring the new environment with their pre-move travel mode, often walking (Quote 1).

Quote 1:

Interviewer: “[...] So why do you think coming here, what made you cycle, was it just a new start, you didn’t know anybody?”

Shrewsbury 10: “Yes, you see people on their bikes [...] and the cycle lane routes and I quickly worked out that I could get to ASDA or I could get to the shops on cycle lanes without going on a road [...] I used to walk to ASDA and I went oh, I could do this on a bike, it would be much better [...]”.

The evaluation of the new physical environment was often in comparison to previous conditions (Quote 2). This is substantiated by findings from other studies suggesting that both the former and new environments play crucial roles in determining post-move cycling and transport behaviours (L. B. Christiansen et al., 2014; Smart and Klein, 2018; Whybrow et al., 2021).

Quote 2:

Woking 8: “Moved in at the, late August last year. And we came from Stretton, where no one in their right mind cycles [...] I have always liked cycling I have just not always done it. And moving to, this is particularly with reference to sunny Stretton, moving to Surrey felt very green, it’s nice, the air is clean, there are no sirens, it’s a nice place. So all that kind of encouraged me to head out [...]”.

Smart and Klein (2018) found that exposure to good transit options during young adulthood was linked to increased transit usage later in life, even after moving to areas with poorer transit access. However, our findings suggest the opposite for, particularly leisure, cycling: having

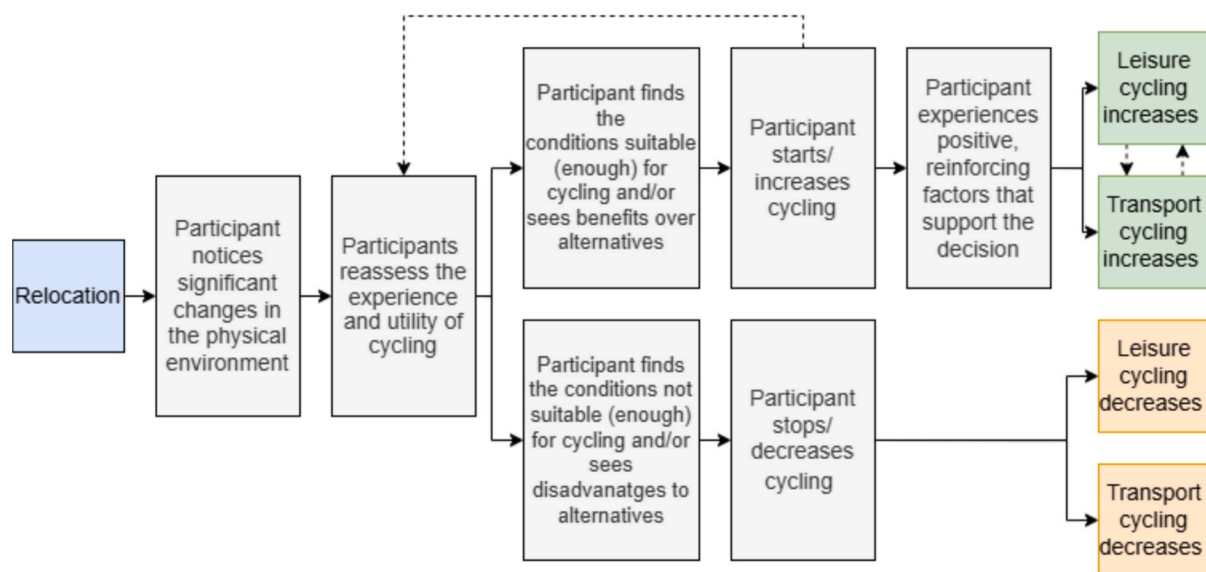


Fig. 1. Physical Environment Mechanism. The independent variable 'Residential Relocation' is displayed in blue. The outcomes in cycling behaviour are displayed in green (increases in cycling) and orange (decreases in cycling). A dashed arrow indicates a link present for some but not all participants. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

lived in a location particularly conducive to cycling often became a barrier to continuing the habit after relocating to a less favourable environment (Quote 3 and 4).

Quote 3:

Southend 12: “[...] when I lived in [small town], it was a small town and any direction you went in you were out in the country straight away, and I used to cycle there far more [...] since coming here the whole scenario is different here, there’s streets that are full of traffic, narrow roads, parked vehicles, the pleasure, cycling for pleasure is not, I don’t think, in this immediate area, is something that I’m interested in doing anymore.”.

Quote 4:

Southport 1: “[...] we lived for nearly ten years in France, which is where I bought my bicycle and it was very nice cycling out there, although there was hardly any flat land at all, it was all up and down and I’d probably do the equivalent of here to London and back again in a year, just out every day doing it. Come back here to Southport, [...] and I haven’t really, although it’s a cycling town, it’s not got quite the same ambience as cycling in France unfortunately, so I don’t really do quite as much as I used to [...]. I hate other traffic, after being so used to riding round empty roads [...]”.

Participants who decreased or stopped cycling because of finding the physical environment to be less suitable tended to describe this as regrettable but inevitable. Sometimes, the lack of a “need” to cycle was stated either regarding distance or the presence of better alternatives to cycling.

It was not always apparent whether the evaluation occurred as a single event before the change in behaviour or as a repeated, ongoing process—represented by the dotted arrow in the mechanism schematic. Findings from Jones and Ogilvie (2012) would support the latter, finding that recent movers continually negotiated, reassessed, and adjusted their travel behaviour. In this analysis, some participants began cycling and found the experience so positive that they discovered further benefits and increased cycling even more, often expanding to other types of cycling (e.g., starting with leisure cycling and then incorporating transport cycling, or vice versa). For others, however, this ongoing evaluation led them to discover disadvantages that made them discontinue cycling (Quote 5). This re-evaluation was only observed in individuals who increased cycling, whereas those who decreased cycling stuck with their initial decision. This suggests that decision to increase cycling may be less resolute and dependant on the factors considered in the initial evaluation staying the same.

Quote 5:

Shrewsbury 10: “I don’t bike as often as I did [...] Winter was really hard. I got a bit ill and then it was like, do you know, it’s easier just to get the bus [...] the other thing is, there’s no showers at work, I would come and I would be drenched in sweat [...] it takes me twenty minutes to bike, I start at 9.30 and then dropping my son off, that gives me ten minutes and it’s like, it’s really tight. [...] the bus gets me in at about, it can go from ten past to quarter past, I’m not soaking and I can have a cup of tea in the morning, which makes all the difference when you’re prepping, that little bit of time.”.

Deviant cases of participants who moved but did not alter their behaviour often described that their surroundings had not changed significantly, typically because they relocated a relatively small distance. This indicates that this mechanism required a substantial change to be triggered and is in line with previous literature (Scheiner and Holz-Rau, 2013; Zhu et al., 2014).

The range of factors that participants considered in their assessment of the environment echoed Singleton (2013)’s Hierarchy of Travel Needs which outlines five levels of factors shaping travel behaviour. Lower levels represent fundamental requirements, while higher levels relate to more subjective travel motivations. At the base sits individual

feasibility, which includes individual mobility, awareness, and travel schedules, above are “accessibility”, covering proximity to key destinations and connectivity, “safety and security”, addressing both traffic safety and crime concerns, and “cost”, incorporating time, money, effort, and convenience. At the top is “pleasure”, which includes enjoyment, comfort, exercise, and health benefits. In particular, the elements of accessibility, safety, and cost were brought up by our participants. “Pleasure” was also considered, but typically after cycling had been trialled. While Singleton includes health under “pleasure”, our participants often discussed health separately. In some cases, health and pleasure conflicted, and unlike pleasure, health was considered as a factor before cycling was tried. This suggests health may warrant separate consideration from pleasure.

Distance was frequently mentioned in the interviews and had a significant effect on cycling decisions (Quotes 6 and 7). This is supported by previous research which consistently showed that greater distances between the home and common destinations like the workplace are associated with reduced levels of active travel after relocation (B. Clark et al., 2016; De Vos et al., 2021a; Fatmi and Habib, 2016; Woods and Ferguson, 2014). Interestingly, Clark et al. (2003) found that women tend to commute shorter distances and are more likely to reduce commuting distances after a move compared to men which should make them more inclined to increase cycling. Several theories, including the accessibility theory (Higgins, 2011) and space syntax theory (Hillier and Vaughan, 2007), support distance and individuals’ (perceived) accessibility to destinations as key influences on behaviour. In addition to enhancing opportunities for cycling (Sallis et al., 2011; Wendel-Vos et al., 2007), higher levels of accessibility also offer opportunities for social interaction (Kenyon et al., 2002; Sharmeen et al., 2014) and employment (Cervero et al., 1999), which can further influence cycling behaviour.

Quote 6:

Leighton 12: “[...] It’s only since I’ve been living here [...] and I thought, well, [work] is only like two miles away, so why use a blooming car.”.

Quote 7:

Leighton 9: “[...] my mum lives in Dunstable, which is [now] seven miles away [...] when I lived in Leighton or lived in Dunstable prior to Devon and I used to cycle loads, like because my mum lived in Dunstable, I used to cycle and often pop out in the evening, just to get on my bike and cycle up there. It was so much easier.”.

Overall, the *Physical Environment Mechanism* corresponds to many established behavioural theories, including Bronfenbrenner’s ecological systems theory and the social-ecological model (Bronfenbrenner, 1977), the theory of planned behaviour (Ajzen and Fishbein, 1988), and the COM-B model (Michie et al., 2011). For instance, cost, safety, and distance relate to the theory of planned behaviour’s “perceived behaviour control” (perception of the ease of performing the behaviour), and the COM-B element of “opportunity” (the external factors which make the execution of a particular behaviour possible).

Both the theory of planned behaviour and the COM-B model emphasise deliberate decision-making and indeed the *Physical Environment Mechanism* demonstrates how individuals actively assess and respond to their surroundings and transportation/leisure options to determine the feasibility and desirability of cycling. There is also a contrasting position of automatic, effortless choice and decision making (for instance, Cass and Richard, 2008). While automatic processes often dominate in routine situations (Evans and Stanovich, 2013), it appears that significant (physical) changes prompt conscious decisions on behaviours. This aligns with the habit discontinuity hypothesis, which suggests that relocation can disrupt routines and lead to active re-evaluation of travel decisions (Verplanken et al., 2008).

An alternative explanation for this mechanism could be residential self-selection (X. (Jason) Cao et al., 2009; Guan et al., 2020), where participants’ decisions are guided by pre-existing intentions and

preferences for certain behaviours rather than by an unbiased evaluation of the environment. However, previous studies found that even after controlling for self-selection, environmental features remained a significant influence on travel behaviour (Aditjandra et al., 2012; X. Cao et al., 2007; Handy et al., 2006). In this study, many participants explicitly stated that they were unaware their area was conducive to cycling, had no intentions of changing their behaviour, or were surprised by the ease and suitability of cycling in their locality (Quote 8).

Quote 8:

Bristol 2: “[...] that I could successfully commute [by bike] was pretty impressive and that I hadn’t expected”.

Moreover, participants often mentioned a variety of factors that influenced their decisions, indicating a certain level of engagement and responsiveness to the environment. The fact that participants renegotiated decisions and started or stopped cycling as conditions changed further supports the influence of the environment over internal intentions.

3.2. Social environment mechanism

This mechanism operated through changes in participants’ social circles and household composition following relocation (Fig. 2). It highlights the impact of the social environment on cycling behaviour, a factor emphasized in previous studies (Klinger and Lanzendorf, 2016; Lin et al., 2018; Scheiner and Holz-Rau, 2013; Sherwin et al., 2014) but often less regarded in the dominant debate, which tends to frame behaviour change as a result of either individual intentions or physical environmental shifts (X. (Jason) Cao et al., 2009; Klinger and Lanzendorf, 2016; Scheiner and Holz-Rau, 2007). We identified two pathways for this mechanism, (1) being closer to social contacts who cycle increased cycling by offering opportunities to ride together and normalising the behaviour; (2) changes in the proximity to key social contacts impacted motivations and priorities for cycling. Decisions on cycling were based on fewer factors compared to the *Physical Environment Mechanism*, and social factors were clearly asserted as the main reason for change.

Distance and time were important in operationalising this mechanism as being closer or further away from other individuals and thus spending more or less time with them arose as a key consideration (Quote 9).

Quote 9:

Blackpool 3: “[...] I think moving here has definitely made us cycle a bit more, but that’s more because we’re actually together rather than maintaining separate households so we have more leisure time. I can’t think of anything else.”.

The first pathway involved moving closer to social contacts who cycle, often due to changes in the household resulting from relocation. This proximity led to increased cycling either by cycling together with these individuals or by normalizing and feeling encouraged to cycle. Partners’ cycling knowledge and confidence sometimes made it easier for participants to start their own cycling (Quote 10).

Quote 10:

Interviewer: “What was the main reason that made you start cycling when you came to Bristol?”.

Bristol 8: “I think the cycle lanes, probably, and knowing people that did cycle as well [...] also having somebody to cycle with because if you’re actually going out on your own and you don’t know where you’re going and you don’t know Bristol that well, then you still don’t know where are the cycle lanes are and the shortcuts and the easier ways to go and the best ways to avoid.”.

This pathway may also work in reverse with greater distance from cycling companions or closer proximity to non-cyclists, but we did not observe participants changing their behaviour primarily for this reason.

The second pathway operated through social changes that impacted participants’ motivation or priorities. For example, a recently divorced father explained that moving reduced time spent with his sons, prompting him to spend his spare time with them rather than engaging in leisure cycling (Quote 11). Another divorced man explained how meeting his new partner shifted his priorities, leading to a slower, more purposeful life that allowed him to focus on his health and cycle with his stepdaughter.

Quote 11:

Interviewer: “When did you stop going out at the weekends more or less?”.

Leighton 4: “Really I think pretty much when [the domestic circumstances changed and] I moved to the flat downstairs. I do occasionally, it depends whether I’m seeing the children or not for the weekend.”.

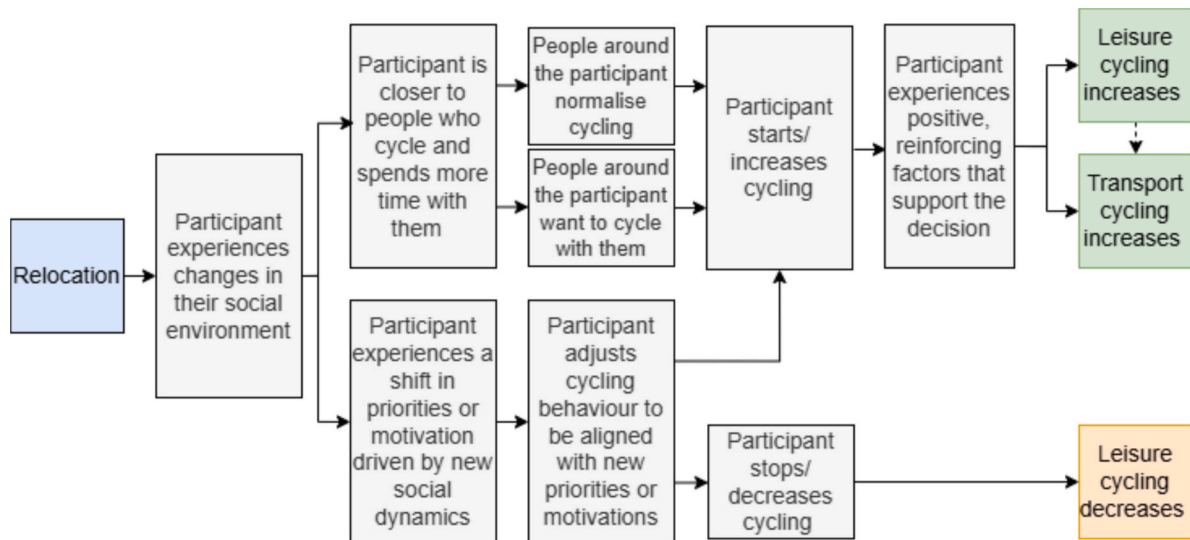


Fig. 2. Social Environment Mechanism. The independent variable ‘Residential Relocation’ is displayed in blue. The outcomes in cycling behaviour are displayed in green (increases in cycling) and orange (decreases in cycling). A dashed arrow indicates a link present for some but not all participants. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Interviewer: “So what’s happened since you’ve moved to the flat, why do you think you’ve stopped doing it?”

Leighton 4: “Well, mainly because as I say, I don’t mind cycling to and from the railway station when it’s nice [...] but at the weekends I see my sons.”

Both pathways mainly involved social changes within participants’ households. This is contrary to studies proposing the notion that households are unified entities within which everyone shares the same preferences and aspirations (Dieleman, 2001; Steele et al., 2013). A previous analysis of social influences using the CCT data (Sherwin et al., 2014), categorized them into three levels: immediate household members (“Direct Social Influence”), acquaintances outside the household (“Less Direct Social Influence”), and the broader social and cultural context (“Indirect Social Influence”), finding evidence for social influence at all levels. In our sub-sample of movers, less direct and indirect social influences were not as influential. While participants sometimes noted the presence of cyclists in their area, this often related to feelings of safety in traffic and confidence in navigating streets rather than a social connection that encouraged cycling. In a few instances, participants received encouragement to cycle from less direct social contacts but felt it wasn’t relevant to them because the individuals suggesting it were too removed and different from themselves (Quote 12).

Quote 12:

Bristol 9: “I think there is some pressure at work, I’ve had colleagues say it’s so good it’s less harm to the environment and so on but I don’t take it I tried, I mean, it’s just different situation for them they live in London, on their own [...]”.

The influence of the social environment on behaviour is well-established in social science literature and increasingly recognised as an important factor in travel behaviour research (Carrasco and Miller, 2009). Theories like social ecological theory (Bronfenbrenner, 1979) and social network theory (Borgatti and Ofem, 2010) emphasize how individuals’ behaviours are shaped by their social interactions, relationships, and networks. In studies of transportation mode choices, comparable dynamics have been described as ‘social spillover effects’ or the ‘neighbour effect’ (Goetzke and Rave, 2011; Mau et al., 2008). Moving then likely amplified the influence of social connections by maximising proximity and time spent together.

Hägerstrand’s (1970) coupling constraints theory adds that travel and leisure choices shaped by the schedules and activities of close contacts are less flexible than individual decisions since multiple people must align their needs. Many participants mentioned cycling together or making joint commitments. As a result, once these shared decisions were made—often towards increased cycling—these could be more resistant to change and become a lasting part of people’s routines. In the second pathway, participants often substituted leisure cycling for more social interactions. Theories such as the self-determination theory (Ryan and Deci, 2000) and social cognitive theory (Bandura, 2001) explain that while intrinsic motivation can drive individuals to engage in activities that improve well-being, the immediate social rewards of being with others can easily overshadow these pursuits. Additionally, once the initial benefits of healthy activities have been felt, maintaining them can be challenging as the perceived need diminishes (McEwan et al., 2022).

In terms of alternative explanations, the social environment may significantly shape behaviours and choices, but it is noteworthy that it is itself influenced by the physical environment (Florida, 2004; Hillier and Hanson, 1989) and remains challenging to isolate (Dugundji et al., 2008; Sherwin et al., 2014). Factors like housing, amenities, jobs, and infrastructure attract specific populations with distinct preferences, lifestyles, and behaviours. As such, participants may have underestimated the physical environment’s influence in curating a social group that exhibits certain cycling behaviours, and their self-selection into these environments. Then again, social influences often remained prominently highlighted as the drivers of behaviour change. Moreover, the effects

were most strong for direct social changes within the household which are the most independent from external physical conditions. Often it appeared plausible that household members would have made similar cycling decisions even in different environments.

3.3. Intentions mechanism

The *Intentions Mechanism* operated through individuals’ personal intentions, expectations, and desires for specific behaviours (Fig. 3). Unlike the mechanisms driven by changing physical or social conditions, this mechanism involved internal motivations and plans rather than external influences. In some cases, these intentions preceded and even influenced the decision to relocate to a certain area, potentially reflecting residential self-selection bias. The mechanism affected both leisure and transport cycling, though the impact on transport cycling appeared stronger and, in some cases, preceded that of changes in leisure cycling. This mechanism exclusively led to increases in cycling.

Although participants reflected on their cycling experiences and expressed satisfaction when environmental factors met or exceeded expectations, this mechanism did not involve thorough evaluation of options or responding to conditions at the destination. In fact, some participants with a strong intention or plan to cycle persisted with these plans even when conditions were not ideal (Quote 13). Guell et al. (2013), similarly found that people continued walking and cycling to work despite adverse environmental conditions.

Quote 13:

York 6: “I don’t really think that we were better drivers in Germany, I just think that people here just don’t care [...] and in that sense I don’t feel as secure [...],

Interviewer: With the other options of using the car or public transport available when you first started cycling to work, what made you choose your bicycle as your form of transport?

York 6: It’s an interesting one because before I’ve never had a car and [...] I just do cycle because I didn’t have another possibility and I always cycled because I also liked it [...]. Yeah I think I never really had that question I always would cycle really. [...].

Interviewer: So your first thought was to cycle rather than what are my alternatives?

York 6: Yes.”.

Among the various reinforcing factors supporting this mechanism, one stands out as particularly distinctive for this mechanism: the integration of cycling into one’s lifestyle (Quote 14 & 15).

Quote 14:

Southend 10: “I moved down here for a different type of lifestyle [...] We probably cycle more now but in a different way because our lifestyle has changed and that could be why I am cycling more.”.

Quote 15:

Cambridge 8: “[...] it is the totally different way of mind-set that they have in Cambridge. [...] I have just never experienced it before, it’s definitely a way of life.”.

These quotes also highlight participants who deliberately chose their location to adopt a more active lifestyle that includes cycling—a crucial step in the process of residential self-selection. This idea is echoed by other participants within this mechanism, such as in Quote 16.

Quote 16:

Blackpool 12: “We walk more here, since we moved here, because that’s why we came here. [...] we don’t really want to travel by car anymore”.

Interestingly, most participants acquired or upgraded bicycles to act on their intentions, highlighting how strong intentions can overcome the barrier of not owning a bike. However, for one participant, the cost of purchasing bikes prevented his family from pursuing their intention to

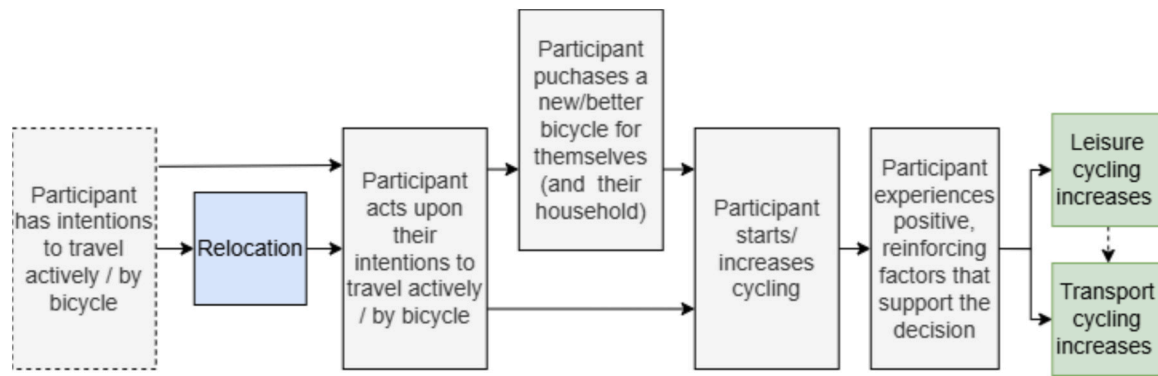


Fig. 3. Intentions Mechanism. The independent variable 'Residential Relocation' is displayed in blue. The outcomes in cycling behaviour are displayed in green (increases in cycling). The dashed box and arrow present links / part of the mechanism that were present for some but not all participants. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

cycle more. Other studies have similarly shown that material inequalities limited people's ability to act on their intentions, as financial resources limited their ability to relocate or stay aligned with their behaviour preferences (Coulter and van Ham, 2013; de Groot, 2011). Our finding adds that when people can afford to move, other costs of acting on their intentions can be often, but not always, manageable obstacles.

Besides financial considerations, social, environmental and personal changes acted as barriers to fulfilling cycling intentions post move. This aligns with Berry et al. (2010), who found that despite relocating closer to outdoor recreation facilities to improve health, participants' BMI increased over six years, highlighting a gap between intentions and actual outcomes. For example, one participant intended to cycle regularly but couldn't fulfil this intention because her partner, with whom she planned to cycle, suffered a severe back injury (Quote 17). This demonstrates how intention formation and execution are often collaborative, especially with a romantic partner, making them vulnerable to changes that affect more than just the individual.

Quote 17:

Shrewbury 6: "I'm quite a green sort of person generally [...] I came here and because we moved to Shropshire I thought lovely, we can cycle, we bought the bikes and then everything went wrong, my husband got a bad back [...] When I first got that bike, I think I went for one cycle ride [...], I cycled right along the River Severn and back, which was lovely, really lovely, I just never did it again."

Additionally, one participant experienced fear of cycling after a collision and moved to an area intending to walk. Yet, over time, they became more confident in their surroundings and abilities, eventually starting to cycle again. This is in accord with a study by De Vos et al. (2018) showing attitudes and intentions can change (in accordance with a new residential environment). Another participant moved to a house close to their workplace with the intention to cycle but when the workplace relocated farther away, they stopped cycling and returned to using a car.

Following the concept of implementation intentions (Gollwitzer and Brandstätter, 1997), forming specific plans that link events with responses (e.g., "If I move to this area, then I will cycle daily"), should increase the likelihood of translating intentions into behaviour, even when faced with obstacles. Accordingly, De Vos et al. (2021b) found most movers were able to change their travel behaviour in congruence with their travel attitudes. However, the effectiveness of implementing intentions in this sample appeared influenced by the quality of the planning and the actual match between planned intentions and the new context. Additionally, it meant that behavioural change was delayed until the move occurred.

This mechanism differed from previous ones in that decisions to

cycle were driven by internal intentions and desires rather than an evaluation of external factors once the move was completed. According to Ajzen's theory of planned behaviour (Ajzen, 2011), all behaviour results from intention, which is itself influenced by attitudes, subjective norms, and perceived behavioural control. In this study, individuals with intentions to cycle had positive attitudes towards cycling, felt social support and made commitments to cycle with others (subjective norms), and believed they could successfully cycle after moving, often in referencing suitable distances (perceived behavioural control).

However, rather than a one-directional influence from attitudes, norms, and control onto intentions, participants in this study exhibited a bi-directional relationship. For example, having the intention to cycle led to increased behavioural control through actions like buying bikes, or increased subjective norms through meeting and connecting with people who were interested in cycling.

The *Intentions Mechanism* exemplified the process of residential self-selection. According to residential self-selection, intentions to cycle can influence movers' destination choices so that observed changes in cycling reflect these pre-existing preferences rather than an impact of the new residential environment. While we found clear evidence for the role and influence of intentions on cycling decisions, this should not be interpreted as negating or diminishing any influence of the built environment on observed cycling behaviour. Accordingly, several studies that have criticized residential self-selection bias for being too simplistic (James et al., 2015; C. H. Jones and Ogilvie, 2012; Ramezani et al., 2021; Zang et al., 2019). First, it is important to acknowledge that residential self-selection involves a pre-move assessment of environmental conditions to identify areas favourable for cycling. Zarabi et al. (2019) noted that this information-seeking phase is especially prominent among home buyers. This means that the environment itself is still important in attracting those intending to cycle into this specific area (Næss, 2014). Others added that self-selection can lead to both underestimates as well as overestimates of the effects of the built environment (Chatman, 2009). Moreover, we found that the execution of intentions was not guaranteed, and several factors – including environmental influences – were able to affect whether intentions are realized. Attributing all behavioural patterns solely to self-selection overlooks these connections and barriers. Correspondingly, many studies have concluded that there is an influence of both the environment and self-selection on travel behaviour after relocation (X. (Jason) Cao, 2015; L. B. Christiansen et al., 2014; De Vos et al., 2021a; Zang et al., 2019).

3.4. Plausible determinants of mechanisms

We identified several similarities among participants in different mechanisms, suggesting plausible determinants that influence which

mechanism a person follows. Given the small sample size, these observations are exploratory and not conclusive. Notably, individuals should not be seen as permanently belonging to any mechanism group; each move should be assessed independently. Characteristics are situational and can change between moves, as shown by individuals changing their behaviour after one move but not the next. Additionally, it is important to highlight again that all moves in this study were to areas that received investment in their cycling infrastructure through the CCT project. As such, an underlying determinant for all mechanisms may be a certain baseline level of support for or opportunity to cycle.

Participants influenced by the *Physical Environment Mechanism* were predominantly male, with 8 out of the 12 men in the sample following this pattern. Previous studies have found gender differences in how physical environments affect behaviour and health, with some finding larger effects for men (Foster et al., 2012; Wasfi et al., 2016), others for women (Schipperijn et al., 2015). Participants were usually younger than those affected by other mechanisms, with most aged 25–44 and one aged 20–24. Nearly half had no children living with them, unlike those in other mechanisms where having children in the household was more common. Previous research has found the absence of children increased commitment to active transportation in areas with high walk and bike usage (Fatmi and Habib, 2016). This mechanism also stood out for including individuals without cars or driving licenses. More than half had not cycled before relocating. Participants often relocated longer distances and experienced significant changes in their physical environment, several gained access to a bicycle through the move.

The two paths of the *Social Environment Mechanism* show distinct gender patterns. All women ($n = 2$) increased cycling due to proximity to people who cycle (with them), while all men ($n = 3$) experienced a shift in social priorities or motivation due to the move, which then influenced their cycling behaviour. This relates to previous findings on gender differences in active transport uptake (Garrard et al., 2006; Yuan et al., 2023), while also shedding light on potential mechanisms underlying these differences. Notably, the female participants often had bicycles purchased by their partners. Participants were nearly evenly split between the 25–44 and 45–64 age groups. All were employed full-time and had some cycling experience prior to relocating.

Those reporting the *Intentions Mechanism* were more likely to be female (3 out of 4) and all had driving licences and access to cars. Most participants experienced substantial environmental changes through the move. Despite their interest in cycling more, there was no noticeable difference in their environmental or health consciousness compared to those in the other mechanisms. Similarly, a previous study with a large UK sample (Whittle et al., 2022), found no significant interaction between environmental concern and changes in bus, train and bicycle use.

There were no discernible differences between mechanisms based on urbanicity, city size, or the direction of the move (e.g., rural to urban). However, this information was also not available for all participants, and without precise address details, the conclusions remain tentative.

4. Implications for theory

Our study enhances the theoretical understanding of cycling behaviours following relocation by outlining three distinct mechanisms of change. While one corresponded to the established concept of residential self-selection, most participants did not mention any cycling intentions when choosing their location or subsequent behaviours. Instead, the majority actively assessed their new physical environment post-move and continued to evaluate external influences.

Moreover, while some participants showed the typical one-directional influence of attitudes, norms, and control on intentions following the theory of planned behaviour, others displayed a bi-directional relationship. In these cases, intentions to cycle reinforced attitudes, norms, and perceived control, highlighting the reciprocal relationship between internal intentions and other factors, that advocated for more continuous, interactive theories.

Current debates on behaviour changes and health after moving often focus on self-selection bias versus environmental factors (Cao et al., 2009; Klinger and Lanzendorf, 2016; Scheiner and Holz-Rau, 2007). We emphasise a third pathway of change through social influences, which has received comparably little attention in this debate with some exceptions, for instance Scheiner and Rau (2020), Badawy et al., (2019), Sherwin et al. (2014), Klinger and Lanzendorf (2016), and Lin et al. (2018). Additionally, we showed that factors counteracting decisions based on the environment and formed through intentions could affect participants directly or indirectly through their social circles, an aspect regularly overlooked.

Overall, we advocate for developing comprehensive theories that capture the dynamic decision-making process after relocation and embrace complexity, rather than oversimplify black-boxing the process. This aligns with increasing demand for robust theories of change and the exploration of intervention mechanisms (Cambon et al., 2019; Craig et al., 2008; De Silva et al., 2014; Moore et al., 2019; Panter et al., 2017).

5. Implications for practice

Understanding how decisions to engage in or avoid healthy behaviours like cycling are made is crucial for shaping policies and interventions that not only initiate these behaviours but also support their continuation, ultimately ensuring they lead to the desired outcomes. The environment remains an important influence for many participants, reinforcing the importance of continuing policy efforts to create supportive conditions for cycling, such as improving cycling infrastructure. This is particularly relevant given our findings that (a) physical changes are the most compelling factor in attracting new cyclists who previously had no engagement with cycling, and (b) individuals who perceive physical conditions as unsupportive often do not re-evaluate their decisions. Participants often recognized the benefits of cycling after trying it, highlighting the need for interventions that facilitate practical cycling experiences. The role of social changes offers new opportunities for intervention and should be further explored. Interestingly, all participants in the *Intentions Mechanism* increased their cycling, demonstrating that intentions may be predominantly pro-cycling due to existing education and awareness campaigns that promote cycling as a healthy and beneficial activity. This suggests that such campaigns should be continued and strengthened, while enhancing understanding and prevention of factors that foil the execution of intentions.

6. Strengths and limitations

This study employed process tracing as a novel method in transport research to investigate causal mechanisms of post-relocation changes in cycling behaviours. Building on prior research (e.g. Chatterjee et al., 2013; Heinen et al., 2018; Janke and Handy, 2019; H. Jones et al., 2014; Scheiner and Holz-Rau, 2013), it is among the first to dissect the specific mechanisms driving cycling behaviour change after relocation. A notable strength is our secondary analysis of existing interviews, which allowed us to explore new research questions and extract additional insights from existing data. However, relying solely on one data source limited the method's ability to triangulate findings and enrich conclusions through diverse perspectives. Additionally, the time lag between the original interviews and this analysis may have affected the relevance or applicability of findings to current circumstances.

Moreover, some aspects that have previously been shown to affect the relationship between relocation and cycling behaviour change, such as income, tenure, or the direction of the move (de Haas et al., 2018; Fatmi and Habib, 2016), were not available through the interviews. Relying on self-reporting and participant recollection could have further introduced inaccuracies, and focusing on cycling behaviours in the interviews may have led to overstatements of cycling efforts or under-reporting of other mode uses. We acknowledge some subjectivity in interpretation and the possibility of having missed alternative

explanations despite rigorous analysis efforts. Our outline of supporting quotes for the various elements of the mechanisms and evaluation of alternative explanations in the Appendix aims to defend interpretations and make decisions more transparent and replicable.

Finally, due to the purposive sampling and small-case design, this study alone cannot determine which mechanisms are most prevalent across the general population or how often moving leads to changes in cycling. There is opportunity for future research to utilize longitudinal panel studies with larger participant samples to track behavioural changes before and after relocation, or to employ experimental/quasi-experimental designs to assess the impact of infrastructure interventions. Mixed-methods approaches that combine robust survey analysis with deeper qualitative insights from interviews, observational, or ethnographic data could enhance the generalizability of the identified mechanisms across different contexts. Additionally, integrating further data sources—such as travel behaviour surveys, census data, GPS tracking, and social media/app-based data (e.g., Strava)—could provide a more comprehensive understanding of commuting patterns, demographic influences, and real-time cycling behaviours post-relocation.

7. Conclusion

We identified three distinct mechanisms through which residential relocation affects cycling behaviours: physical environmental changes, social environmental changes, and intentions. While the *Intention Mechanism* consistently resulted in increased cycling, physical and social changes could lead to either increases or decreases. Positive experiences, such as enjoyment and improved confidence, are crucial for sustaining increased cycling, whereas their absence could lead to unsuccessful changes.

Our findings challenge the overemphasis on self-selection bias, revealing that most participants did not base their relocation decisions on cycling intentions. Even those with cycling intentions faced obstacles in acting on them. Instead, most participants actively assessed their new physical environment and its suitability for cycling. Interestingly, ongoing reassessment was common among those who increased cycling but not those who reduced cycling. Additionally, having lived somewhere that was good for (leisure) cycling often presented a barrier to continuing cycling at a new destination with different physical features.

Our findings also emphasize the sometimes overlooked role of social changes in influencing cycling behaviour post-relocation. While much attention has been given to environmental factors and self-selection bias, the impact of changes in social dynamics has been comparatively small. Our study shows that these social changes can significantly influence cycling behaviour through different pathways, which seem to be

gender dependent. It also shown that for movers, changes in the direct social influences of family and household members had the largest effect. We recommend further research on the role of social factors and its consideration for intervention and policy development alongside physical influences and intentions.

Relocation presents a significant opportunity for behaviour change, capable of leading to increases and decreases in cycling through various influences and mechanisms. Further exploration of decision-making processes and innovative methods, such as process tracing, are needed to better understand how behaviours change and what strategies could be effective for promoting desired behaviours. This study offers foundational insights into post-relocation cycling behaviour, highlighting the need for comprehensive theories and interventions that account for the complexity of these processes.

CRediT authorship contribution statement

Caroline Kienast- von Einem: Writing – review & editing, Writing – original draft, Visualization, Software, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Derek Beach:** Writing – review & editing, Validation. **Alice Reid:** Validation, Supervision, Conceptualization. **Jenna Panter:** Validation, Supervision, Project administration, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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8. Data statement

The data underpinning this research is publicly available through the UK Data Service as 'Interviews with Residents of Cycling City and Towns', UK Data Archive, <https://doi.org/10.5255/UKDA-SN-852083>.

Appendix – Overview of supporting quotes and alternative explanations

In this section, we provide supporting quotes for the various elements of the mechanisms for each participant. While some mechanism parts do not have an exact corresponding quote, this does not imply a lack of evidence for their presence; for instance, the concept of increasing cycling might be pervasive throughout the interview or was expressed in a complex manner across multiple sections making it difficult to deduce one, easily digestible quote. We also include a column for alternative explanations and remarks, where we outline other potential explanations and mechanisms considered for each participant, along with the rationale for not attributing behaviour change to these alternatives.

Overall, this appendix does not offer a complete overview of all quotes but serves as an indication and introductory summary of how mechanisms were derived and supported by the interviews. It provides a concise match between the empirical data and the theoretical deductions we made.

Physical changes mechanism

Participants following this mechanism: Bristol 2, Bristol 8*, Cambridge 3; Chester 11; Leighton 9; Leighton 12; Shrewsbury 10, Southend 4, Southend 12, Southport 1, Woking 8, Woking 11.

*Bristol 8 is assigned to both the Physical Changes and the Social Changes Mechanism.

Path 1: Participant finds the conditions suitable (enough) for cycling and starts/ increases cycling

Participant	Elements of the Mechanism						Alternative explanations and remarks
	Participant notices significant changes in the physical environment	Participant (re-) assesses the experience and utility of cycling	Participant finds the conditions suitable (enough) for cycling and/or sees benefits over alternatives	Participant starts/ increases cycling	Re-evaluation	Participant experiences factors that reinforce the decision	
Bristol 2	I: “You’re originally from Seattle?” P: “Yep.” I: “Is it unusual for an American to use a bike as a mode of transport?” P: “Yeah, I mean Seattle’s got, it has much better bus service than here so it’s much easier to get around, but the difference, [...] I think Bristol’s a much denser city than err Seattle is [...] my wife can walk to, she can walk from home to work very easily [...] that’s something that you simply couldn’t do I think in the US.”	P: “[...] instead of spending under 30 min on a bike I was spending over an hour and a half like walking on those days so it didn’t make sense.” P: “I think we got here we saw this was a total if we could walk it we could cycle it [...].” P: “[...] we just can’t afford a car I think at this point.”	P: “[...] when I commuted to work in the US I commuted by car, but my work was also like 30 miles away which is kind of the same as [current workplace], more or less. Urm, so, yeah here it makes sense, somehow it makes sense” I: “How is it taking a bicycle on the local trains?” P: “It’s easy, it’s really easy, and actually there are a lot of people that do it so” P: “I think we got here we saw this was a total if we could walk it we could cycle it you this is totally, well in terms of size Bristol is very cycle-able [...]” I: “Did you start cycling in the UK for practical reasons?” P: “Yeah”		P: “Well I’ve just had a change of employment so I was commuting to Oxford, err for the last two years. But now as of September 1st things changed.” [...] I: “So What will you then do, will you be cycling less?” P: “Yeah, cause I’m based from home now, I’m based from here so like cycling now is very, very much limited to like our allotment or to shopping, basic shopping needs and things like that.”	I: “Since taking up cycling in the UK have your expectations or perceptions of it been met or fulfilled?” P: “[...] that I could successfully commute the way I did was pretty impressive and that I hadn’t expected you know” P: “It felt good you know it felt like I had a routine, I didn’t have to buy a car, [...], I was always on time.” P: “[...] that we can do it and it’s been kind of relatively successful I think [...] if we moved to another place [...] it will be critical to make it a city we could cycle around in [...].”	Social Changes Mechanism: P: “Everybody I think for the most part all of our friends have bikes and we cycle around” → Does not talk about cycling with other people or them having a significant impact on him. Physical changes remain predominant. Intentions Mechanism: P: “I think Europe you know, in general, when we decided to come over, we had a sense that this would be, we’d be able to cycle more, you know, and that’s um, a plus. People should make it easier for us to do it I think” → Has a positive perception of being active but did not choose location specifically for cycling. In fact he spent the first 6 months walking because he wasn’t sure how good/easy cycling would be Social Changes Mechanism: I: “What impact do you think moving here has had on the level of cycling you do?” P: “It’s increased, it’s increased enormously and I’m not sure whether that’s the influence of obviously my partner or whether it’s the influence of being up here and having the cycle lanes” → this participant has been assigned to both mechanisms. Already started to increase cycling before the move when they visited Bristol: I: “So did you used to come up and cycle round Bristol before you actually moved here?” P: “Yeah, yeah.” [...] I: “Is there any particular points in this time when you think it’s increased?” P: “Well probably from last, I’d say April [when (continued on next page)
Bristol 8	P: “[...] by then I’d already sort of moved up and realized it was so much easier to get around by bike and I hadn’t, I’d sort of cycled on and off but because of the hills in Cornwall it always put me off a bit?”	P: “I do find also that in Bristol you’ve got a lot more cycle lanes than you have anywhere else, so I feel safer when I’m on the road than I did before”	P: “As I said round here it’s so much easier to get on your bike than it is to take the car out and at first you think argh I can’t be bothered with putting my helmet on and everything else but then its, it’s just easier. So much easier to do it.”	I: “Would you say your usage of your bike has increased over the year?” P: “I’d say it’s definitely increased”		P: “I’ve always been a bit of a wimp when it comes to like going up hills and things, but I am actually so much better now that I can just get up the hills on the gears and I’m not sure. When I first started it was like “no, no, I can’t get up the hill!” but I think I’m a bit fitter now than I used to be.”	

(continued)

Participant	Elements of the Mechanism						Alternative explanations and remarks
	Participant notices significant changes in the physical environment	Participant (re-) assesses the experience and utility of cycling	Participant finds the conditions suitable (enough) for cycling and/or sees benefits over alternatives	Participant starts/ increases cycling	Re-evaluation	Participant experiences factors that reinforce the decision	
Cambridge 3	I: "So when did you start back cycling again?" P: "After we moved to Cambridge, so I did move to the South East where I was living far enough away from work that it wasn't really practical and then I moved out to Asia, Taiwan where cycling for traffic reasons just definitely wasn't an option."	I: "So when you came back from Taiwan, you came back here." P: "We came back to Cambridge and cycling is friendly enough."	P: "[...] for me it helps to keep me in shape, it's cheaper and with [female] needing the car it's cheaper than a second car and it doesn't take many months of running a second car to pay for a really good bike. So, that was it really there being lots of cyclists here and it being nice and flat is a handy bonus really"	I: "So when did you start back cycling again?" P: "After we moved to Cambridge [...]"	I: "Basically in terms of your level of cycling are you likely to increase it or sustain it at the same level." P: "Sustain certainly, increase I think that will depend on whether [female] changes her job and I am cycling to work both ways and that's fine with me, I would probably do that rather than buy a second car, so circumstances will determine that one a little bit"	P: Yes. I find it a great stress relief actually. [...] It's partly because of the thing between work and home and partly with the route I take a lot of the route is not on streets it is on cycle paths or shared use paths and if you have had a bad day it is a great sort of stress relief to hammer it home on the bike and to work out the energy by the time you get home." P: "Yes I am in better shape now than I was for sure. I have noticed that I am getting home from work quicker, I am using higher gears, things like that from regular cycling so I am noticing the effect."	<i>she moved], well from last January when I was here all the time."</i> → The move remains an important event to intensify and solidify the behaviour. Cooccurring life event (Change in partner's job): I: "All this time you have basically been cycling, is the level the same, has [female] always worked?" P: "No she started working earlier this year and so I have probably done more cycling since then, simply because before I had the option of taking the car in but I was cycling to work before that some days particularly when it was nice. I was more of a fair-weather cyclist then but now even on a day like this I cycle to work or home from work" → He still increased from no cycling at all to "good weather" cycling through the move without being affected by his partner's work pattern. Other life event (Change in job): I: "Has anything else had an impact on your travel patterns?" P: "Just the unemployment, and the hill" → The move to a physically different area led to an increase in cycling, whereas the unemployment reduced the need to cycle and led to a decrease. Both have an independent impact on the participant's cycling behaviour.
Chester 11	I: "Has that been similar across 3 years?" P: "No, when we lived in [suburb] we didn't [cycle] too much because we lived at the bottom of a hill, I'd rather walk [...] It was also, I didn't like to cycle there because I'd have to go on the road and I don't like doing that because my bikes quite small"	I: "What was it that first made you think you should cycle?" P: "I'm quite lazy, so as I said before you can't really drive into town cause there's no parking cycling saves you 15 min, and that's 15 extra minutes in bed"	P: "You've got lots of ways to cycle, like via the canal and the canal goes through the city and you've got lots of exits on that and that's quite nice, it's nice cause Chester is really congested and there's hardly any parking so you can just park your bike in town, so that's probably the benefits of cycling in Chester" I: "What about the alternative to the car?" P: "Taking the car is a bit of hassle, because if you take the bike you can usually get directly into town, whereas if you take the car you have to park the car, you have to pay for parking, that's a bit pointless and then you've got to walk	I: "Do you use your bicycle to get to work and back?" P: "During the time I lived here I did"	P: "I shall be doing [more cycling] from when I start this new job"	I: "Why do you choose the bike as your mode of transport?" P: "It's faster than walking, and its, well my bikes quite fun, cause it's a kids bike, everyone looks at it and says oh look at that it's a Raleigh Chopper, I can meet people by talking about my bike as well." P: "I got a lot fitter because at some point I was going up a tiny hill and it did make a bit of a difference and yeah, I think I probably got more confidence because like you say when people would stop you and talk about your bike, so there's more interaction, it's quite social, whereas if you walk people kind of ignore you"	

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Participant	Elements of the Mechanism					Alternative explanations and remarks
	Participant notices significant changes in the physical environment	Participant (re-) assesses the experience and utility of cycling	Participant finds the conditions suitable (enough) for cycling and/or sees benefits over alternatives	Participant starts/ increases cycling	Re-evaluation	Participant experiences factors that reinforce the decision
Leighton 12	P: “[...] It’s only since I’ve been living here [...] and I thought, well, [work] is only like two miles away, so why use a blooming car.”	I: “[...] basically from what you’re describing it was the proximity of your work and the fact that you could do it, I mean what gave you the idea, you know, you had a car, you could have just driven.” P: “Yes, probably saving money, because petrol’s gone sort of sky high now.”	anyway from the car park, so the bikes usually more direct in Chester”			I: “So I mean do you enjoy cycling?” P: “Oh yeah, oh definitely.” I: “So your main reason is fitness and exercise, but are there aspects of it that you like about it?” P: “Yeah, just basically it makes me feel better.”
Shrewsbury 10	I: “So it’s three years [at this property] and prior to that you moved from [northern city].” P: “Yes.” I: “So in [northern city] did you ride?” P: “No, it’s too hilly, it’s so hilly and I walked everywhere, [...] you had to be so fit to be able to get up and down the hills and there was no cycle lanes at all, I mean compared to here”	I: “[...]” So why do you think coming here, what made you, was it just a new start, you didn’t know anybody?” P: “Yes, you see people on their bikes, you see all ages from young to really old people on their bikes out and about and the cycle lane routes and I quickly worked out that I could get to ASDA or I could get to the shops on cycle lanes without going on a road [...]”.	P: “I used to walk to ASDA and I went oh, I could do this on a bike, it would be much better and you can’t carry as much as now I’ve got packs on my bike, I can load it up and I can get quite a lot, whereas I was having to do two or three trips, walking and not carrying very much.”	I: “[...] do you cycle to work?” P: “I do in the summer.” I: “And have you done that always since you got here?” P: “[...] as soon as I moved here [...] I went on a cycling course, because I wasn’t comfortable with riding on the roads”.	P: “Winter was really hard. [...] I got a bit ill and then it was like, do you know, it’s easier just to get the bus. [...] the other thing is, there’s no showers at work, I would come and I would be drenched in sweat [...] and the timings, it takes me twenty minutes to bike. [My colleagues] would just laugh at me because I’ve got all my gear on and my helmet and I’d walk around with my helmet on.”	Previous location (which was a cycling city) could have raised interest in cycling: P: “[...] because of coming from [northern city] and it being a cycling town, there was a lot of cycling workshops and stuff going on and as soon as I moved here, I went, oh, let’s see if there’s anything on in Shrewsbury and I didn’t know it has suddenly turned into this cycling town and there it was, a cycling course, so I went on a cycling course, because I wasn’t comfortable with riding on the roads.” → It was the physical conditions of the northern city (too hilly) that prevented cycling there and a change in these conditions that led her to explore cycling as an option.
Woking 11	I: “Why didn’t you cycle in Reading?” P: “Because I was lazy, lived at the top of a very steep hill” I: “Has anything in Woking encouraged you to cycle?” P: “I suppose the change in work and having to work in an easily cyclable distance away it means I’m more inclined to do it, the whole pattern of life it quite different” Previously bike was in storage: P: “[...] Trying to	I: “Did the cost of the second vehicle have anything to do with your want to cycle?” P: “Yes it did, it was the second car that we only really used on occasions, so the cost of insuring and taxing, MOTing, servicing just didn’t add up really, also there’s a car hire place down the road, [...], it meant that on the rare occasion when we really did need 2 cars [...] then I could hire one, and we worked out for	P: “The bikes about as easy as the car for that journey” I: “So you started cycling more here” P: “I suppose the flatness was a factor that makes it more easy to achieve” I: “Is there any financial incentive?” P: “Yeh, you don’t have to pay for parking or fuel”	I: “Have you cycled to work since you moved to [previous area in Woking]?” P: “No, only really when we moved here (center of Woking)”	I: “Has anyone ever made any comments about cycling?” P: “No, only positive ones, just like, oh that’s good you’re on your bike today, that sort of thing” I: “Do you enjoy the cycle ride?” P: “Yes, mixed, usually, I enjoy the space, the head space really, it’s only 10 min if you do it quickly, but just being outside, you can be more kind of connected, fresh air”	Cooccurring life event (Change in job): I: “Were you working full time?” P: “I was doing the web stuff full time, so mostly at home so I didn’t really need to cycle much” → It still feels that the physical environment, including regaining access to a bike, were more influential. Additionally, he engages in cycling beyond commuting to and from work Evidence against

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Participant	Elements of the Mechanism						Alternative explanations and remarks
	Participant notices significant changes in the physical environment	Participant (re-) assesses the experience and utility of cycling	Participant finds the conditions suitable (enough) for cycling and/or sees benefits over alternatives	Participant starts/ increases cycling	Re-evaluation	Participant experiences factors that reinforce the decision	
	<i>remember where my bike was at that time, bike might have been in storage cause we were in a flat, yeh that was it"</i>	<i>the number of days we'd need 2 cars it was cheaper to hire one than it was to own one"</i>					Intention Mechanism and self-selection: P: "Woking is a pretty reasonable place to cycle, so that's would have attracted me more towards it. We didn't move here because of cycling [...]." Evidence against Intention Mechanism and self-selection: He does not want to change behaviour when he arrives, he wants to continue using the gym. He is also not aware of cycling opportunities in Woking: I: "Were you aware that Woking was a cycling town?" [...]." P: "Haven't a clue when we came here."
Woking 8	P: "[...] And moving to, this is particularly with reference to sunny Stretton, moving to Surrey felt very green, it's nice, the air is clean, there are no sirens, it's a nice place. So all that kind of encouraged me to head out, very defiantly." P: "[...] having moved here, there must be half a dozen gyms within a mile of this house. And I have tried every single one and either they were far too expensive or they didn't have the right equipment or in one particularly entertaining case, they had the right, they had the equipment I wanted to use but they had it under a low ceiling. So as I am [tall], i found it unbelievable, so that was fairly frustrating" P: "[...] then I realised, or remembered, that urm I, had at that point a 25 year old bike that was sitting in the garage having been in storage. So once we moved here everything came out of storage and there was kind of rationalisation, anyway I had this bike and I thought that my wife actually said 'well why don't you go for a bike ride and see how it is? See whether you enjoy that. "			P: "So I kind of started [cycling] more and more and started taking it more and more seriously urm and it got to the point where I was doing, well I am doing, I cycle 5 or 6 times a week as my primary form of exercise"		P: "[...] the first couple of times I felt like I was having a pulmonary embolism. And um, I persevered and I absolutely loved it, it's so much more fun than being in a large room listening to the sound of fans and loud televisions, and surrounded by (makes sound of machines), machines."	

Path 2: Participant finds the conditions not suitable (enough) for cycling and stop/ decreases cycling

Participant	Elements of the Mechanism				Alternative explanations and remarks
	Participant notices significant changes in the physical environment	Participant (re-) assesses the experience and utility of cycling	Participant finds the conditions are not suitable(enough) for cycling and/or sees disadvantages over alternatives	Stops / decreases cycling	
Leighton 9	I: "Are there any other sort of things that have happened that have affected your travel, you've talked about moving here and the children getting older, is there anything else?" P: "I think that's sort of the main, obviously where you live, that's a massive influence on your transport. I think that's the main thing, basically where you live and your job and things like that." P: "[...] my mum lives in Dunstable, which is [now] seven miles away [...]."	P: "[...] when I lived in Leighton or lived in Dunstable prior to Devon and everything I used to cycle loads, like because my mum lived in Dunstable, I used to cycle and often pop out in the evening, just to get on my bike and cycle up there. It was so much easier." P: "Again it's not particularly busy all the day, only during certain periods, the rush hour, but I'm always like petrified of like a massive great lorry knocking them and they wouldn't even know, they wouldn't know, they'd be in that ditch and no-one would know, so I'm very aware of that."		P: "[...] I don't think I've ever done it since I've been here, I don't think I've ever cycled into Leighton Buzzard."	Social Changes Mechanism (She moved in with her Fiancé): P: "Yes, [fiancé]'s got a bike, he's got the same bike as me, he's got a Giant [...], he doesn't go on it very much." → The observed changes mainly occur for transport cycling and seem independent from (not) having someone to cycle with Other life event (Her children are getting older): I: "And did you ever go out for a bike ride?" P: "Oh, yes, lots of times [...] with the boys." I: "And is that something you still do?" P: "Well, no, I was just saying to [fiancé], actually, no, because they don't want to come with me anymore, no. [younger son] sometimes, he was going to come out this morning with us, he'll come out with us, you know, but no, I've lost the other one." → The observed changes mainly occur for transport cycling and seem independent from (not) having someone to cycle with (continued on next page)

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Participant	Elements of the Mechanism				Alternative explanations and remarks
	Participant notices significant changes in the physical environment	Participant (re-) assesses the experience and utility of cycling	Participant finds the conditions are not suitable(enough) for cycling and/or sees disadvantages over alternatives	Stops / decreases cycling	
Southport 1	P: "Right, we've been here since 2008/9, here, before that we lived for twelve months down south [...] in Bexhill and St. Leonards and before that we lived for nearly ten years in France, which is where I bought my bicycle and it was very nice cycling out there, although there was hardly any flat land at all, it was all up and down and I'd probably do the equivalent of here to London and back again in a year, just out every day doing it. Come back here to Southport, [...] and I haven't really, although it's a cycling town, it's not got quite the same ambience as cycling in France unfortunately, so I don't really do quite as much as I used to [...]." P: "I hate other traffic, after being so used to riding round empty roads and a car was a major event [...]"		I: "Okay, has anything else happened in your lifestyle or household in the last three years that's likely to impact on how you travel and how you cycle and walk or take the car or anything." P: "Well, apart from turning sixty and getting my bus pass, you know."	P: "So I just do [cycling] strictly for pleasure and occasionally to do some shopping, that's all."	Evidence against Intention Mechanism and self-selection: P: "I only ended up in Leighton Buzzard, because I couldn't get the school that I wanted to in Dunstable, [...] I just need somewhere to live [...]." → Gaining access to a free bus pass could be seen as an alternative explanation but then again it could be seen as a feature of the environment and transportation system of the area
Southend12	P: "[...] when I lived in [small town], it was a small town and any direction you went in you were out in the country straight away, and I used to cycle there far more for exercise purposes as opposed to shopping or whatever, I used to cycle there quite a lot, since coming here the whole scenario is different here, there's streets that are full of traffic, narrow roads, parked vehicles, the pleasure, cycling for pleasure is not, I don't think, in this immediate area, is something that I'm interested in doing anymore."			I: "Do you make any other cycling journeys?" P: "I don't do, I used to do a bit of cycling for charity and I used to do a lot of cycling for pleasure when I was young man, not racing or anything, but in recent years its more, if you call necessity going to a shop, more necessity than pleasure cycling."	Other life event (Health condition) I: "Has your cycling for those trips [exercise] remained the same?" P: "Probably slightly less that I used to do" I: "Why is that?" P: "Well I'm developing unfortunately a heart condition so I get a little bit breathless so I take the easy option and use the car" → If the physical conditions made it easier to cycle, it could still be possible for him to cycle despite his condition

Social changes mechanism

Participants following this mechanism: Blackpool 3; Bristol 8*; Leighton 4, Shrewsbury 2, Stoke 8.

*Bristol 8 is assigned to both the Physical Changes and the Social Changes Mechanism.

Path 1: Participant is closer to people who cycle and starts/ increases cycling

Participant	Elements of the Mechanism					Alternative Explanations
	Participant experiences changes in their social environment	Participant is closer to people who cycle and spends more time with them	People around the participant normalize cycling People around the participant want to cycle with them	Participant starts/increases cycling	Reinforcing factors	
Blackpool 3	P: "[...]I think also the fact that [Husband] and I are now in the same house so it's easier to plan to actually cycle."	P: "I think moving here has definitely made us cycle a bit more, but that's more because were actually together rather than maintaining separate households so we have more leisure time. I can't think of anything else."	I: "[...] what do you think the influence of other people has on your cycling? Do you think that plays a part in your cycling? Whether other people cycle with you or not?" P: "[...] probably, because I like cycling with other people, because you've got somebody to talk too and you do feel safer as well."	P: "[...] I think moving here has definitely made us cycle a bit more [...]." I: "[...] and when did you start cycling that journey to the promenade?" P: "[...] within the last couple of years, because of moving here."	I: "is there anything that motives you to continue cycling that journey?" P: "[...] just the actual pleasure of it, it feels good to get out and actually do some form of activity that is enjoyable, unlike say, going to the gym perhaps, which is a bit of a slog at times, but to actually get out on a nice day is just enjoyable."	Intentions Mechanism: I: "What do you think the main reason is that you cycle more?" P: "I think because, or lack off before, we have more time now, we've invested in buying new bikes, we deliberately planned to go to France this year, and were hoping maybe next year as well to do another stretch of the Noire. So we are sort of seeing it as part of our life,

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Participant	Elements of the Mechanism				Alternative Explanations
	Participant experiences changes in their social environment	Participant is closer to people who cycle and spends more time with them	People around the participant normalize cycling People around the participant want to cycle with them	Participant starts/increases cycling Reinforcing factors	
					sort of chosen lifestyle.” → It appears these intentions are set together and as part of living with each other. Maybe an upcoming move could follow the Intention Mechanism. Physical Changes Mechanism: I: “[...] is it anything to do with the location of the house that makes you cycle more?” P: “I think it probably does because it’s [house location] near the park, and you can go sort of into the park and across the park [...]. Or you can go the other way and straight down onto the prom which takes about a quarter of an hour and you’re on the prom. So you can cycle all the way up to Fleetwood if you wanted too.” → Seems like they are not actually using these routes she outlines and even though she thinks positively about these physical factors do not seem to drive the change in cycling behaviour Physical Changes Mechanism: P: “I do find also that in Bristol you’ve got a lot more cycle lanes than you have anywhere else, so I feel safer when I’m on the road than I did before” P: “[Cycling]’s increased, it’s increased enormously and I’m not sure whether that’s the influence of obviously my partner or whether it’s the influence of being up here and having the cycle lanes” P: “by then I’d already sort of moved up and realized it was so much easier to get around by bike and I hadn’t, I’d sort of cycled on and off but because of the hills in Cornwall it always put me off a bit?” → This participant has been assigned to both mechanisms.
Bristol 8	Moved to Bristol where partner lives: I: “How did you find out about the ways to store your bike on the train?” P: “That was my partner, because he knew.” I: “How did he know about it?” P: “He’s always cycled, he’s been cycling here for the last ten years so, it’s like, and he used to cycle up Park street everyday [...].” I: “What made you buy a bike?” P: “Well I didn’t buy it [partner] bought it for me!”	I: “What was the main reason that made you start cycling when you came to Bristol?” P: “I think the cycle lanes, probably, and knowing people that did cycle as well. So they are the two main things and actually also having somebody to cycle with because if you’re actually going out on your own and you don’t know where you’re going and you don’t know Bristol that well, even though I lived here ten years ago, then you still don’t know where are the cycle lanes are and the shortcuts and the easier ways to go and the best ways to avoid”	I: “You mentioned people influencing you to cycle, namely your partner. Is there anyone else you know that cycles?” P: “Yeah, there’s [male friend] and [female friend], they cycle.”	I: “What impact do you think moving here has had on the level of cycling you do?” P: “It’s increased, it’s increased enormously [...]”	

Path 2 A: Participant experiences a shift in priorities or motivation and stops/ decreases cycling

Participant	Elements of the Mechanism				Alternative Explanation and Remarks
	Participant experiences changes in their social environment	Participant experiences a shift in priorities or motivation driven by new social dynamics	Participants adjusts cycling behaviour in response to new	Participant stops/ decreases cycling	

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Participant	Elements of the Mechanism				Alternative Explanation and Remarks
	Participant experiences changes in their social environment	Participant experiences a shift in priorities or motivation driven by new social dynamics	Participants adjusts cycling behaviour in response to new priorities or motivations	Participant stops/ decreases cycling	
			priorities or motivations		
Leighton 4	I: "This sounds quite personal, but have you been living on your own for the last three years?" P: "Two and a half years." I: "So when you moved into the flat downstairs." P: "Yes." I: "And before that were you living in the family home?" P: "Yes"	I: "So, after the London to Brighton cycle ride, what happened?" P: "Well, I carried on for a bit longer after that and the domestic circumstances changed and so I didn't use it so much." I: "Do you still go out at the weekend." P: "I did, but not much." I: "But not recently." P: "No, no." I: "When did you stop going out at the weekends more or less?" P: "Really I think pretty much when I moved to the flat downstairs. I do occasionally, it depends whether I'm seeing the children or not for the weekend." I: "So what's happened since you've moved to the flat, why do you think you've stopped doing it?" P: "Well, mainly because as I say, I don't mind cycling to and from the railway station when it's nice [...] but at the weekends I see my sons." I: "Right, so you're busy with them, doing things with them?" P: "Yes."		I: "Do you go out for a bike ride?" P: "I used to, yes, I used to go every weekend I used to go out [...]"	
Shrewsbury 2	P: "Before I moved here, I lived in a place called Shifnal which is twenty miles away and I'd just got divorced and I was cycling morning and night [...] Because I was living by myself, eating rubbish really and I thought it was about time I did something about it, you know, I was putting a lot of weight on." Now got new partner: I: "[...] does your partner cycle?" P: "No." I: "She doesn't like cycling?" P: "Well, we'd like to, we'd like to, but again she works in a school, she's got a stressful job and by the time she gets home from work she's done in, you know, so it's something we'd like to do, yeah." I: "What about her son, does he cycle?" P: "That's a no"	I: "[...] are there any other barriers to you cycling, would you say? What other things do you think apart from, you've said time, other things that you don't ..." P: "To be honest, me at the moment, because of what I'm doing, it's motivation to do it, you know, to get up and just go."	I: "[...] And what sort of journeys do you do on your bike?" P: "At the moment because of obviously the job, very little, because of the time."		Physical Changes Mechanism: P: "Just don't have time, because it's dark when I go and it's dark when I come back. [...] because I worked in Stoke, I was leaving at 5.50 in the morning and I got forty miles there, getting back at night, forty miles back." I: "Exhausting." [...] P: "Well, yeah, because of doing my college stuff as well, I mean at the time I was doing my Certificate of Education and a degree at the same time." I: "Which is quite a challenge to put it mildly." P: "I would say because you're up here and you've got to come back up a hill every route you go out." I: "That's a bit of a disincentive." P: "Yes." → There is no information about his previous commuting time and the college course has now finished. The mentions of the hill appeared more emphasized by the Interviewer than him. Throughout it appears more that there is a lack of motivation than actual physical barriers to leisure cycling Other Life Event (Health Condition): P: "Well, we have been known to go out together on our bikes, you know, just have a bit of a trip round. I mean I've got arthritis in my knees and by the time I've had a long day and come home, my legs just don't want to work." → It is unclear when his arthritis starts, and he only mentions this once

Path 2B: Participant experiences a shift in priorities or motivation and starts/ increases cycling

Participant	Elements of the Mechanism					Alternative Explanation and Remarks
	Participant experiences changes in their social environment	Participant experiences a shift in priorities or motivation driven by new social dynamics	Participants adjusts cycling behaviour in response to new priorities or motivations	Participant starts/ increases cycling	Reinforcing factors	
Stoke 8	P: “I moved into here in July 2009. [...] I lived about forty five miles away [...] My life has completely changed around now, I’ve gone from living in a seven bedroom former Victorian school house with my wife and no children to living in Stoke on Trent which I’d never even been to before I met [partner].” P: “[I used to be an] event manager at the [venue employer], Z 4 car, no kids, no mortgage and life had completely changed and I couldn’t be happier, but it’s been a journey.” P: “[...] I live with my partner, [partner] and my stepdaughter, [younger stepdaughter], who’s [a secondary school age] in a couple of weeks time and her sister lives just up the road and has her own place with her baby who’s just coming up to twelve months old. “	P: “[...] I just didn’t really have the time or motivation, it was kind of all about the job for quite a long time and since I worked with my wife as well we were both more or less in the same boat. She liked cycling, though, but it just kind of, if you’re not careful jobs and lifestyles are going to take over, aren’t they?” P: “[...] I’ve always been reasonably fit and active and I put a bit of weight on, so I did that kind of middle aged old man crisis sort of thing and I joined the gym, [...] and I upgraded my bike [...]. So yeah, it was a conscious effort to be more active and also it was a great way to learn, because I’d never been to Stoke on Trent before and it was a great way to learn the area”	P: “[...] I went through a period, [...] although I’d got a bike hanging up on the wall in the cellar, it didn’t really go anywhere, [...] cycling for me, it’s sort of very much coming back to it, which is really nice.”		P: “ You always feel sort of slightly sanctimonious, don’t you, when you’ve sort of done something that’s healthy, [...] so yeah, it’s free, isn’t it and it’s convenient and so it tends to be easier and I drive for work as well, so if I can do local areas on my bike, I really like that.” I: “So you enjoy it”. P: “Yeah”. P: “[...] so I went, took some of my redundancy money and went out and bought myself a really posh all terrain bike.”	Cooccurring life event (Job Change): I: “Brilliant, okay, so it’s really since you finished that job that you’ve really had the opportunity to get more into [cycling].” → There are a lot of changes happening at the same time but the effect of being in with a new partner and her children seems to be the key driver and also the reason for the move and job change. Social Changes Mechanism Path 1 (Being near and having someone to cycle with): I: “[...] And what do the people around you think about cycling and your cycling, are they keen on it as well?” P: “Yes, [younger stepdaughter] will come out with me, I mean considering she’s [her age], she’s still pretty keen on that sort of thing [...] [partner]’s not very good on a pushbike, so she’s a bit, like I say, she’s a bit wobbly and stuff, so yeah, less enthusiastic, but quite supportive.” Physical Changes Mechanism: P: “[...] the quickest and most efficient way, especially parking in Stone, is to just cycle in. [...] plus Stone’s a nice town to have a walk round.” → The social life changes appear more influential and that, even if he had moved to a different area to be with his partner, his cycling behaviour would have still changed

Intentions Mechanism

Participants following this mechanism: Blackpool 12, Cambridge 8, Southend 10, York 6

Participant	Elements of the Mechanism					Alternative Explanation and Remarks
	Intentions and self-selection preceding the move	Participants acts upon their intentions to travel actively / cycle	Participant purchases a new/better bicycle for themselves (and their household)	Participant starts/ increases cycling	Reinforcing factors	
Blackpool 12	R1: “[...] Didn’t like the countryside. We walk more here, since we moved here, because that’s what we came	R1: “[...] because most of it’s on the doorstep isn’t it. I think that’s the big crooks of it for us, we’ve come here and we	I: “You said that recently you’ve purchased a bicycle, how long ago was that?” R2: “About a year”	I: “Has the amount of car journeys you have been doing changed in the past 18 months?”	R2: “And also, I think it’s made us, because we didn’t do this at our last place, it’s helped us to become more of a part of	Physical Changes Mechanism: P: “We tend to choose the promenade all the time, a because it’s... there’s no (continued on next page)

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Participant	Elements of the Mechanism					Alternative Explanation and Remarks
	Intentions and self-selection preceding the move	Participants acts upon their intentions to travel actively / cycle	Participant purchases a new/better bicycle for themselves (and their household)	Participant starts/ increases cycling	Reinforcing factors	
	here.” I: “Did you move here for the job?” R1: “Yes” [...] R2: “We actually make a conscience decision to work in the same place so that we only ever have one car.” I: “What draws you to wanting to be active?” R1: “well for me, its something I’ve done all my life [...]”	don’t really want to travel, and you know...” R2: “We say travel; we don’t really want to travel by car anymore”	I: “And what about the hybrid?” R1: “Only, that’s probably about, under a year [...]”	R1: “It’s gone right down” I: “Is there any particular time/ reasons as to when/ why it started to reduce?” R2: “When we moved here two years ago” R1: “As soon as we moved here really [...]”	the community and find out things that are going on, because we didn’t [...] take part in events in the local community whereas we have done here” R1: “It is, every time you go down either the tides in, the tides out, the waves are really going at you or not and its just dead flat, calm. So, to us, every time we go out it is different although it’s the same and we never get tired of it.” R1: “Well we like to stay active and, although we like walking, I can’t walk to far because I’ve got a plastic joint in my toe and in the other foot I’ve got no cartilage between one of my toes – and that gets a bit painful for me. But cycling, I don’t have a problem so, I quite enjoy going out on the bike, and [wife, partner] certainly enjoys the tandem and I think it’s just the enjoyment.”	traffic, it’s a dead straight line, it’s a dead straight journey and the social side of it as well, were together and the view is beautiful” I: “Is there any particular time/reasons as to when/ why [car use] started to reduce?” R1: “[...] , before we were out in the countryside” R2: “It was a 20-mile journey round trip” R1: “There was no transport, were as here, it’s all over the place (laughing) which is brilliant. It’s a complete contrast to what were used too.” I: “So you had to use your car more due to the location?” R1: “Yes.” → As they consciously chose this environment, thinking positively about it and seeing benefits for cycling are still in line with the Intention Mechanism. Physical Changes Mechanism: P: “[...] University a lot of people did use (that was at Essex) bikes but again it was hilly bizarrely, it was up a hill so people didn’t really use them. I didn’t consider using it at all and then in London you take your life in your own hands basically, there is nowhere to lock it up [...]” P: “[...] when we moved to Lancashire I don’t think I even touched my bike it was too hilly.” → For previous moves the reason for not cycling may have been more due to physical barriers but this move appears to operate through the expectation and intentions of cycling in Cambridge Social Changes Mechanism: I: “If I asked you did anyone encourage or recommend you to cycle” P: “Probably my Husband definitely!” → The closeness to the husband did not change through the move, they were already living together Physical Changes Mechanism: It could be (continued on next page)
Cambridge 8	P: “[...] my husband has lived in Cambridge, he was been brought up here since the age of 6 so a bike is what you do in Cambridge.” P: “[...] they just think that it is part and parcel of Cambridge”	I: “Basically you came to Cambridge and you started cycling [...]” P: “[...] I used to use the bus all the time in London but I don’t think I have stepped on one bus since I came here.” [...] I: “Had you cycled in London?” P: “(Laughed) No I wouldn’t have even attempted no!”	P: “The very first thing we bought when we came to Cambridge was we all bought bikes. He bought his bike which he hardly ever uses because he uses the car and I bought mine with the seat with [Daughter’s] helmet and it was like a whole package”	I: “Basically you came to Cambridge and you started cycling [...]”	P: “[...] I literally could throw the pushchair away and it was like “oh my goodness this is a miracle” because I could take [daughter] everywhere [...] the freedom was just incredible.” P: “Again, in Cambridge what is quite interesting is that people are aware that there are cyclists, they are pre-empting the fact that there is a cyclist or they cycle themselves or they have children that they cycle with. Even lorry drivers do it, they stop and wait for you to pass, it is the totally different way of mind-set that they have in Cambridge.” P: “I have never experienced it at all before never, I mean I have lived in London for quite a time, I have moved areas with my parents and then I have also lived in other places as well and I have just never experienced it before, it’s definitely a way of life.”	Physical Changes Mechanism: P: “[...] University a lot of people did use (that was at Essex) bikes but again it was hilly bizarrely, it was up a hill so people didn’t really use them. I didn’t consider using it at all and then in London you take your life in your own hands basically, there is nowhere to lock it up [...]” P: “[...] when we moved to Lancashire I don’t think I even touched my bike it was too hilly.” → For previous moves the reason for not cycling may have been more due to physical barriers but this move appears to operate through the expectation and intentions of cycling in Cambridge Social Changes Mechanism: I: “If I asked you did anyone encourage or recommend you to cycle” P: “Probably my Husband definitely!” → The closeness to the husband did not change through the move, they were already living together Physical Changes Mechanism: It could be (continued on next page)
York 6	I: “[...] what made you choose your bicycle as your form of transport?”			P: “[...] we lived in Harrogate before for	P: “[...] I always cycled because I also liked it. You	

(continued)

Participant	Elements of the Mechanism					Alternative Explanation and Remarks
	Intentions and self-selection preceding the move	Participants acts upon their intentions to travel actively / cycle	Participant purchases a new/better bicycle for themselves (and their household)	Participant starts/ increases cycling	Reinforcing factors	
	P: "It's an interesting one because before I've never had a car and I said I've never had the choice so I never thought-I've been never the sort of person who thought maybe driving was more comfortable, and I just do cycle [...] Yeah I think I never really had that question I always would cycle really."			just a like, four months, and then we came over" [...] I used to take the train to work when we lived in Harrogate" [...] I: "Do you work at the moment?" P: "Yes I do. I work part time sixty percent so I do cycle those three days when I'm working."	know it's quite a nice thing to do, it's sort of relaxing, you have time to wake up before you arrive your work. Yeah I find it's a little bit of exercise before you start get going instead of sitting in the car."	that the physical conditions were restricting cycling (to work) in Harrogate and that physical changes through moving allowed her to cycle more but we don't have enough information on the previous location. Additionally, she notes a lot of negative physical aspects for cycling in the current environment: P: "its really tricky as I think cycling here in York is not bad, but looking back to how I felt before I feel that sort of, sort of drivers are not aware and I find them more obnoxious here. It sounds awful really because I don't really think that we were better drivers in Germany, I just think that people here just don't care, they basically care [...], and in that sense I don't feel as secure [...]"
Southend10	P: "I moved down here for a different type of lifestyle and changed my job etc." P: "I just think that you have an opportunity here to live a healthier life if you consciously try to do that and so we have [...] the reason we moved here was because we like the area and the leisure activities that we could participate in, so I think we saw this as a life-style change for all of us and a lot of that has been to get out more and not sit in a car in a queue of traffic. Do a lot locally if we can." P: " [...] Also a member of my family is a senior transport planner and she organizes car free days and she sold her car and committed to cycling and both of my children got rid of their cars and don't use it any more. [...] So my children have been quite influential on me. [...] I suppose they both have a high moral or ethical view of the world and not wasting things and you kind of have to do that to."	P: "Our aim was that all local things that we do we would either cycle or walk, not get the car out that was our aim."	P: "We have both bought new bikes fairly recently" [...] I: "What prompted you to buy new bikes?" P: [...] We wanted to use them a lot more and they needed to be lighter and easier.	P: "We probably cycle more now but in a different way because lifestyle has changed and that could be why I am cycling more."	P: "Cycling is very much a part of our lives down here now it's easier to do which is one thing." P: "You see more and it's nice because lots of people cycle round here and you get to see people and you feel better afterwards. It doesn't have to be cycling fast but you do feel better at the end of it, you feel like you have achieved something." P: "I just think it's just fun really, it's quite quiet, it's not dangerous it's safe, it's less stressful than driving, it's less stressful."	Other Life Event (Partner's Health Condition): P: "My husband actually stopped work for nine-months because he had a heart attack and so we just went out on the bikes all the time and we would go down to Westcliffe or to Leigh and it was fantastic " [...] I: " [...] suddenly you started cycling three or four times a week, do you know when that was?" P: "About two years ago when I think health wise I thought about my husband's health and they all coincided in a way around two to two and a half years ago, something like that." → Husband's health may have been important in forming the intentions and/or emphasizing existing intentions. The move was a still a meaningful step in realising these intentions

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