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Normalising cycling mobilities: an age-friendly approach to cycling in the Netherlands

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ABSTRACT

Cycling is promoted as a form of urban travel with well-established benefits to health, liveability and wellbeing. These benefits are comparatively large for older people, a growing segment in many populations. Yet, support for the normalisation of cycling mobilities for all ages varies considerably. It is usual to contrast low-cycling contexts, such as the UK, with high-cycling areas, typically favouring highest-rate paradigmatic urban centres. To challenge a too simplistic imitation and re-creation of engineering solutions elsewhere, we draw attention to diverse cycling habits and norms in residents of a more ordinary high-cycling area (suburban Rotterdam), and observe how cycling is normalised throughout the lifecourse. Using mobile and biographical methods, we argue that a more nuanced appreciation of cycling normalisation is gained from viewing ageing and cycling relationally and biographically. This is because the habit-forming realm of normalisation functions through both conscious decisions and unconscious practice, bound up with life events and the external environment. The findings suggest that age-friendly city strategies and urban mobility policies should more closely consider locally constituted social and cultural processes, beyond providing infrastructure. This article thus provides an in-depth account of what it takes for planning and policy to normalise positive, empowering, and age-friendly qualities in everyday mobility.

1. Introduction

Cycling is widely promoted in Northern European mobility planning and policy as a sustainable form of urban travel. Well-established benefits of physical activity for the individual cyclist entail improved health and wellbeing, alongside freedom, sociability and lower travel costs (Aldred 2015; Fernández-Heredia, Monzón, and Jara-Díaz 2014). The physical activity benefits of cycling are especially significant for older people, at a time when this group makes up a growing segment of many populations (Götschi, Garrard, and Giles-Corti 2016). Likewise, when cycling replaces car journeys for short trips, cycle-friendly infrastructures deliver wider social and environmental gains from reductions in traffic congestion, polluting emissions, energy consumption, and noise (Banister 2008; Chapman 2007; Lovelace et al. 2011). All this goes to highlight that cycling features in

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multiple research and policy domains, notably transportation, planning, public health and age-friendly urban design, and from individual, societal and environmental perspectives.

There is a tendency for these separate-yet-complementary approaches to result in partial understanding. Sallis et al. (2004) already proposed greater interdisciplinary collaboration to prevent representations of cycling *either* as a form of physical activity, *or* as a mode of transport, *or* as a marker of cultural identity of discrete population groups. In this journal, Te Brömmelstroet et al. (2017) call for planning practitioners to view cycling mobility more broadly to appreciate experiential features of citizenship and belonging alongside typical focus on cost and utility functions (also Liu, Krishnamurthy, and van Wesemael 2018). Influenced somewhat by recent qualitative studies, notably those based on lived experiences, and the identification of psycho-social factors affecting bicycle use (Pooley et al. 2013; Pucher, Dill, and Handy 2010), we propose further interdisciplinary dialogue on *age-related* cycling normalisation. Both older and young people are easily stereotyped as economically dependent, physically less able and excluded from decisions on urban liveability (Murray 2015). Yet, when cycling is regarded as an all-age activity, substantial health benefits begin young and are realistically continued into later life (Sallis et al. 2004, 250). Rather than view age-groups and activity patterns in a segmented way (school children and obesity, older people and isolation), we pursue a joined-up, all-age approach, taking into account the impact of life events, relationships and local context to explore shifting norms of cycling over the lifecourse (Chatterjee, Sherwin, and Jain 2013). Starting from the interconnected themes of the Age-Friendly City (AFC), we identify common ground in the holistic planning and policy ambitions of cycle-friendliness and age-friendliness. We pursue this integrated approach to draw lessons from the high-cycling Netherlands, also building on Jones et al's. (2016) observations of older cyclists in the UK.

By Northwestern European standards, the UK represents a distinctly 'low-cycling' context. This is partly due to the real and perceived exposure of cyclists to the risk of road traffic accidents and air pollution (Wardlaw 2014). Cycling remains a marginalised mode of transport, especially where cars greatly outnumber bicycles and where air quality is poor (Götschi, Garrard, and Giles-Corti 2016). While recent years have witnessed impressive advances in some cities, such as central London, Cambridge, Oxford and York, nationally barely 3% of the UK population make daily cycle trips (DfT 2015; Pucher and Buehler 2008). Moreover, shares of cycling remain stubbornly concentrated among a cohort of adult years, from 20s through late 40s, disproportionately represented by men and by higher socio-economic income groups (Aldred, Woodcock, and Goodman 2015).

The Netherlands by contrast is a quintessentially 'high-cycling' context. Here it is estimated that 27% of all trips are made by cycle, including a wide range of ages and backgrounds, and with higher shares in some urban areas (Harms, Bertolini, and Te Brömmelstroet 2014). Significantly, we find a distinct correlation between high-cycling and more equal participation rates for women, children and seniors (Aldred, Woodcock, and Goodman 2015; Garrard, Handy, and Dill 2012). The unfavourable comparison that is frequently made between the UK and the Netherlands has led cycling advocates to emulate the Dutch experience, participating in bicycle study tours, for example, to identify ways to increase and "normalise" cycling in the UK (Fleming 2012, 147). At the same time, historical analyses of social and cultural movements challenge the idea that Dutch cycling is a natural and ever-present phenomenon that can be replicated (Stoffers

2012). Previous studies acknowledge that it is perhaps easier for transportation planning and policy to invest in improved safety and convenience for cycle commuting, rather than tackle more complex "hidden" challenges associated with normalising cycling as a mode of transport for going out, shopping, running errands and so on (Muñoz, Monzón, and López 2016, 15).

In this paper we eschew the distracting effects of learning from the most 'paradigmatic' Dutch cycling cities, such as Amsterdam, Groningen, or Utrecht, and physical layout solutions that flow from this approach (e.g. creating 'mini-Hollands' elsewhere). As Steven Fleming (2012, 147) observes, it is "folly" to imagine that the Dutch cycling story can be simply copied and repeated elsewhere. To do so fails to recognise the unique circumstances in the Netherlands in the early 1970s (hundreds of children killed on their bikes every year, mass demonstrations, car-free Sundays and an oil crisis) that led to the wholesale adoption of bike paths and stricter liability laws for motorists. Similarly, spatial interventions may reproduce the social inequality associated with developing new infrastructures (Lam 2018).

The key goal in examining the Dutch experience should be to learn how to make cycling as normal as possible. This goal begins to appear in recent studies that explore the multiple variables implicated in the transition from low-cycling to high-cycling, beyond infrastructure and cycle use by distance cycled, to better understand socially uneven participation. Variables that prompt people to start and stop cycling include age and health-related events and these factors influence the relative normalisation of cycling as an all-age activity (Larsen 2017; Muñoz, Monzón, and López 2016; Winters et al. 2015). Variable 'life events' are also part of a mix of circumstances that precipitate changes in cycling. For example, Bonham and Wilson (2012) cite examples such as moving to a new house, a new job, education, altered physical conditions or awareness, and changes in social relations.

Arguably, the bicycle is a potent symbol of agency, autonomy and freedom, yet it is only used frequently when part of the fabric of daily life. How people inhabit a place and move from A to B and beyond are lived relationships that are integrated into complex patterns of movement, social connections, and lives bound up with others. We argue that cycling is normalised when it is woven into the lived experience of a person's biography (Berg et al. 2014). Yet, with few exceptions, the scientific literature pays little attention to what makes cycling normal in that setting, or for some groups but not others (but, see Murray 2015). Current active transport research on low-cycling contexts typically highlights the need to invest in safer segregated cycling paths and changes to the 'image' of cycling (Aldred 2015; Black and Street 2014). We suggest that separate engineering and cultural approaches may be missing the point – requiring us to explore hidden and intangible constituents of 'ordinariness' in our cycling mobility systems. In this vein, we understand the normalisation of cycling as both consciously and unconsciously constituted.

Our aim is to articulate a more nuanced understanding of the normalisation of all-age cycling in the Dutch context. In doing this we recognise a neglected line of analysis, observing diverse and shifting cycling habits and norms in the ordinary parts of an otherwise high-cycling context. We take our study to suburban Rotterdam to explore the lessons to be drawn from less-extreme (i.e. not central city) 'ordinary' spaces and stories of all-age cycling. Paradoxically, by shining a light on the ordinariness of cycling in

an otherwise high-cycling context, we show that it is not sufficient to imitate the Dutch experience. In short, we offer this as a cautious and qualified assessment of the opportunities and barriers to cultivate normalisation elsewhere.

2. Literature review: cycling normalisation and the age-friendly city

Our paper begins with the place-based 'age-friendly city' (AFC) concept as the framework for considering how cycling normalisation intersects with mobility and health opportunities. The AFC offers a holistic framework because it explicitly attends to the social and physical wellbeing aspects of participation and inclusion. The World Health Organisation (WHO) developed a formal Age-Friendly City programme in 2007, reflecting renewed research and practitioner interest in active ageing through opportunities to enhance quality of life as people age (World Health Organization 2007). Active ageing emphasises the social and economic gains of 'ageing in place' through evidence that independent mobility helps older people maintain social ties and friendships (Buffel, Phillipson, and Scharf 2012; Metz 2000).

AFC member cities measure age-friendliness across eight interconnected themes: transportation; housing; social participation; respect and social inclusion; civic participation and employment; communication and information; community support and health services; outdoor spaces and buildings. These eight domains are typically represented as flower petals, demonstrating non-hierarchical, co-constitutive interdependence (Figure 1). While the AFC programme does not identify an explicit role for cycling, for instance as an expression of active independent mobility, it reflects the comprehensive approach to the use of space and mobility that is needed to unlock cycling potential in different
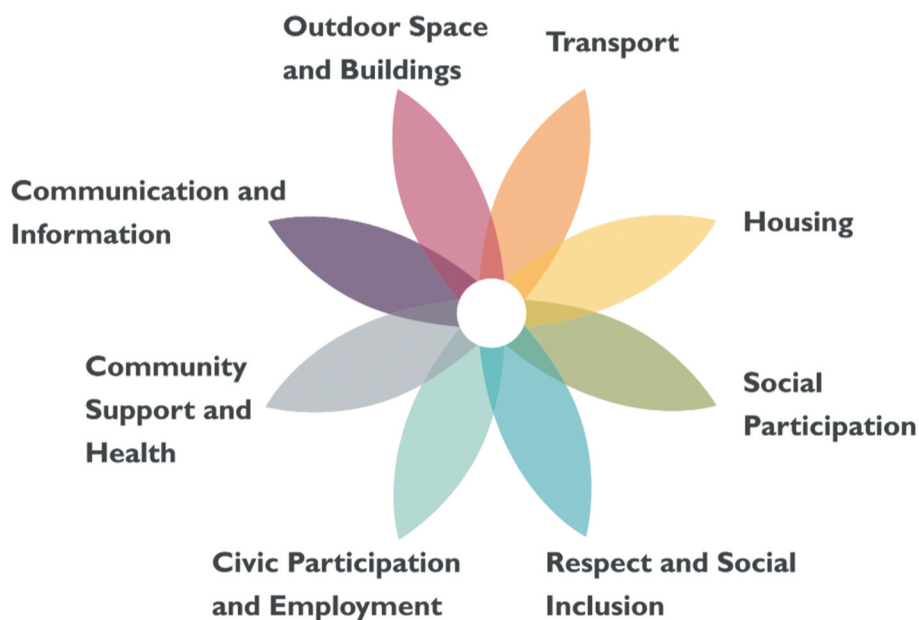

Figure 1. Age-friendly flower (World Health Organization 2007; edited by Age Friendly Manchester).

population segments, and to understand the ways in which ageing interacts with mobility beyond the private car (Götschi, Garrard, and Giles-Corti 2016; Murray 2015).

We thus employ the AFC as a lens through which to view cycling practices at all ages, beyond an explicit focus on transport or health motivations and outcomes. The bicycle and cycling activity have multiple functions that constitute life quality and social networks. In turn, understanding ageing relationally challenges fixed chronological ages and stages, and the tendency to focus exclusively on movement or health motivations or outcomes. It is rare to find this relational view in current AFC literature. As a conceptual model, the AFC has attracted persistent criticism for privileging older people and using ambiguous measures of 'active' and 'successful' ageing (Murray 2015). Indeed, as with cycle-friendly city initiatives, meta-reviews of the scientific literature point to a tendency for AFC advocates to interpret the aspirations and needs of older people through instrumental responses to environmental modification (Buffel, Phillipson, and Scharf. 2012; Lui et al. 2009). Further criticism of separate-yet-complementary approaches has led to shifting emphasis on what is meant by the age(s) and transformations implicated in the AFC concept. Advancements in social geography, for example, emphasise the multiple and fluid geographies of ageing, and foreground an intergenerational understanding (Hopkins and Pain 2007).

In this way, thinking relationally revises the understanding of space, place, and temporality, which is not fixed in meaning or discrete and stationary but instead "forever open to influxes (of people, objects, ideas, and practices) and in a constant state of re-work and transition, endlessly coming into being" (Skinner, Cloutier, and Andrews 2015, 12). Following Murray (2015), we regard ageing and mobility on a non-linear and evolving continuum of small and large transitions, as an intertwined process of lived experience, shaped by life events, disruptions and severances. Mobility is experienced relationally because, as Nordbakke and Schwanen (2014) observe, individual (in)capacities intersect with sensitivity towards personal risk and safety, and with the quality, type, scale, and accessibility of local transport systems. Manderscheid (2014, 364) also highlights this relational complexity by emphasising the way multiple "everyday mobilities" function through evolving social networks and relationships that are not limited to any one place.

This opens up the discussion on (age-)inclusive cycling to the different ways in which the everyday is constituted, through both conscious and unconscious normalisation of mobility practices, as introduced above. On the one hand, conscious generation of new practices (e.g. travel habits) involve developing new capacities, which must be cultivated carefully and with collective support (Bissell 2015). On the other, there is a social reproduction element to normalisation, which, usually unknowingly, incrementally transforms existing practices. This echoes the intriguing duality between 'normalistic' – social rules externally imposed to normalise (mobility) behaviour – and 'normative' norms, which tend to establish normalisation through more natural, emergent processes (Manderscheid, Schwanen, and Tyfield 2014). Consequently, the cycling practice may be ab-normalised by transport planning (Koglin and Rye 2014) or create norms which are open to some people more than to others (Aldred 2015; Freudendal-Pedersen 2015).

A biographical approach has been applied with some success in an attempt to capture these normalisation processes (Berg et al. 2014; Scheiner 2014). Mobility biography research considers the lifecourse as an existing order and a "continuing chronology", in which events in the educational sphere, labour-force participation, and private and family

lives shape travel behaviour. Although mobility milestones and other events are comprehensively documented, they are usually understudied in relation to older age (Müggenburg, Busch-Geertsema, and Lanzendorf 2015; Scheiner 2014). Besides the chronology element, the lifecourse is also characterised by "ruptures, returns and delays" during periods of education, child and family care, and gradual or partial retirement (Berg et al. 2014, 50). Similarly, geographical perspectives on life transitions show that lives are connected and transformed by both personal decisions and negotiations of others' needs and understandings (Hörschelmann 2011).

In sum, the approach to mobility normalisation and habit-formation largely functions through invisible affective dimensions (of wellbeing and motivation), interrelationships (people and place), thinking, learning, practice and performance. Differentiating this 'unconsciousness' from aspects of greater consciousness illustrates that the normalised nature of cycling, and biographical decisions concerning where to live and work, are integrated into complex patterns of social connection and the linked lives of household members (see also Bailey, Blake, and Cooke 2004). Thus, we conceptualise mobility and ageing relationally in this study to advance the AFC through an integrated conceptual model.

As with the eight domains of the AFC, transport is but one aspect of how cycling functions in the lived experiences of ageing and mobility. We claim that relational geographies of ageing, and ways of thinking relationally about evolving socio-spatial transitions of active travel should be developed in cycle-friendly initiatives, notably in the AFC. Following Hopkins and Pain (2007, 290–1), if AFC conceptual models are to view ageing, mobility, and place relationally, future research must variously consider: intergenerationality (relations and interactions between generational groups); intersectionality (exploring the ways in which various markers of social difference, such as gender, class, race, and (dis)ability intersect and influence the multi-dimensional nature of cycling experience); and lifecourse (whereby transitions from paid work to retirement have different situated meanings). Our methods primarily work through the latter in this study.

3. Methods

Relational thinking influences our research design: not only the decision to examine ordinary cycling environments and adults of all ages and cycling experience, but also the selection and mix of qualitative methods. This 'relational mobilities design' provides an empirical example of Manderscheid's (2014) operationalisation of mobilities as relational practices and their methodological implications. We recognise that cycling is perceived and practised in a variety of social realities, even within a high-cycling context. Suburban Rotterdam is selected for study precisely because it is not one of the often showcased cycling cities, such as Amsterdam, Groningen, Utrecht or Copenhagen. Paradoxically, we have to offer a view of cycling from 'off the map' of cycling stereotypes, to refocus attention on the normalisation and ordinariness of cycling experienced by most people in high-cycling contexts. This rationale recapitulates compelling arguments previously advanced to highlight the highly selective influence of key experts and demonstration projects as 'idea brokers' shaping the way policy-makers and practitioners in many countries look to one another for solutions (McCann and Ward 2011).

Rotterdam's dispersed layout (by Dutch standards), flat topography and well-developed public transport network favour a mix of travel modes, including a relatively well-designed cycle network that stretches into all parts of the city. In 2014, approximately 20% of trips were made by cycle (Gemeente Rotterdam 2015). We draw attention to the lived experience of utility cycling in the outer-urban neighbourhood of Ommoord, 7–9 kilometres away from the city centre, described by residents as typical of the "quiet", "boring", "ordinary" suburban areas typical of Dutch cities since the 1970s. In such areas, the infrastructure supporting cycle use attracts less attention than in urban centres. Figure 2 shows a map of the city and location of Ommoord, situated northeast of the urban core and more central neighbourhoods.

The research selected a variety of qualitative and mobile data collection techniques to compile richly detailed biographical accounts of ageing and mobility. The techniques included in-depth biographical interviews, keeping 10-day mobile diaries through smartphone-based GPS tracking, and using a bicycle-mounted video camera (with audio capability). Analysis was 'co-produced' to an extent, since participants were invited to comment on the recorded materials in a second interview, to reflect on their cycling habits and motivations and how this relates to changes in personal and household context. The biographical interviews queried continuities and discontinuities in mobility practices, norms and relationships (between home and work, with family members, and regarding life goals and motivations over time), and the benefits and challenges around

Figure 2. Locational map of Rotterdam (study neighbourhood marked in black).

the travel mode(s) used. Biographical interviews usually lasted between 60 and 90 minutes, whereas the reflexive interviews lasted 55 minutes on average.

The widely reported limitations (Merriman 2014; Spinney 2011) when separately adopting sedentary (interview) and mobile methods in mobility studies were mitigated in our research by triangulating both as complementary methods. For example, a Life History Grid (LHG) technique (Jones, Chatterjee, and Gray 2014) was used to aid imperfect recall and add structure to the retrospective biographical interviews. The LHG indicates the intersection of milestone life events with changes in mobility and health, thus contextualising the additional use of mobile methods within the social and personal sphere. Context was added to the digital recordings through the addition of a running commentary from the cycling participant. This was variously captured synchronously, as an accompanied 'ride-along' on a regular cycle routes (Van Duppen and Spierings 2013; Lee 2016), or asynchronously, using visual representations of journeys to explore conscious decisions and unconscious reflections during the follow-up interview (Jensen, Sheller, and Wind 2015).

Moreover, by combining a variety of verbatim recordings with dynamic mobile interactions, including accompanied rides, it was possible to amplify the observations of individual life histories to reveal hidden but enduring unconscious "taken-for-granted" norms and habits, and participants' "sense making" of cycling practices and daily experiences on a local and situated scale (Jarvis 1999, 229). The mix of narrative data – biographical interviews and commentaries from the mobile engagements – was analysed together using thematic analysis. The first author coded the transcripts iteratively and collected associated data extracts and visual representations (e.g. activity patterns) into potential themes. Primary themes relevant to the aim of this paper, such as "normality of cycling", "lifecourse and transitions" and "mobility and ageing bodies" were examined in more detail and are represented by in the vignettes described in Section 4.

A quasi-quantitative survey was generated from the total sample of 24 adults, who responded to a call for participation through a local cycling organisation, in public buildings, and further snowballing. The survey data include household and employment status, car access, cycle trajectory, and main method of everyday travel. Participants' ages ranged between 18 and 76 at the time of study (58% female), and purposive sampling led to a high representation of those over 55 (71%). Given the relevance of social dimensions for cycling normalisation, Table A1 shows these characteristics for the participants, including those selected for quotation in this article.

4. Empirical findings

4.1. The ordinariness of cycling

While outside observers might describe the Dutch as keen cyclists, the 24 participants rarely view themselves this way. For most, the seeds of cycling normalisation were planted at the age of 5–10 when they learned to cycle as part of their formal education, cycling to school with a chaperone, cycling as playful recreation, gaining independence while socialising with friends. From these early years, cycling becomes rooted in the changes and continuities of their lifecourse (Bonham and Wilson 2012), revolving around

participants' private and professional (career) events and long-term mobility decisions as an incremental process of ageing and adapting to physical and social surroundings.

The cycling trajectory of 14 of these 24 can be characterised as lifelong and resilient. Each are identified according to the "R" type of cycling trajectory developed by Jones et al. (2016, 13); Resilient (consistently continued to cycle), Re-engaged (restarted cycling after a long period), and Reluctant (stopped cycling). These typologies are by no means fixed in time. For example, Sanne (F, 70), who recently stopped cycling, still identifies cycling as an essential life skill. She expected her children to learn to cycle from the age of 5 so that they could begin to move around independently:

> "They just had to learn to cycle. I think at the age of 5 they got their first bicycle (…), it's just part of the job I think. Just like these days when they obtain their driver's license already at 17 (even if they never use it), it's just part of life."

While the trajectories in Table A1 offer a useful shorthand to distinguish current bicycle use, subsequent biographical accounts suggest more fluid relationships. The convenience of cycling around Ommoord is largely taken for granted and few express enthusiasm about cycling. Transitions into and out of cycling are largely explained by its direct, flexible and health-supporting attributes, as well as associations with pleasant encounters including access to natural outdoor environments and a public social life. Yet these values are encountered in the data as unconscious norms, developing over time, and rarely made explicit as conscious reasons for choosing to cycle over another mode of transport. Karel (M, 66) suggests, reflecting on his younger years, cycling appears to be normalised at an unconscious level of just 'following the masses':

> "So when I went to secondary school, yeah, all my class mates came by bike. So that was standard. There was no point in doing something else."

This unconscious assumption that cycling 'makes sense' typically continues into middle age. The embedded and enduring habit-formation also explains the absence of a binary distinction between cyclist and non-cyclist. According to Nicole (F, 60), "[t]he bike is for most of my business the fastest and most direct way", indicating convenience over choice. In another example, Gilles and Carla, a couple in their 40s interviewed together, explain that they moved to the neighbourhood four years ago following relocations in both of their employment, so as to allow them to continue cycling to work within a reasonable distance:

> "Both her [partner] work and mine, she already worked in Rotterdam North, and mine moved there, from the city centre to the North. It was a bloody long bike ride back then!"

Similarly, Evert (M, 63) explains that when he considered a next stage in his career, he thought through the implications of any relocation for cycling to work:

> "I do realise quite well that my career is … well, you have to keep an eye on where you can go for work."

The normalised nature of cycling, and biographical decisions concerning where to live and work resonate with what Pierre Bourdieu calls the "logic of the situation" through which agency is exercised in relation to what is possible, through a web of embodied capabilities (including fitness and health), resources, networks and infrastructure

(Bourdieu 1977: 73–74, 1990). This is illustrated in recurrent analytical themes of positive ageing, wellbeing and collective arrangements in the following two personal vignettes (4.2 and 4.3).

4.2. Caroline's story: cycling and positive ageing

The extent to which cycling is taken for granted in daily life is readily apparent across the sample. However, a closer reading of complete biographies indicates nuanced and varying influences of relational ageing and mobility. For example, the story of Caroline (66) highlights the significance of cycling practices renewed in later life, and positive ageing. It shows how physical (in)capacities interact with local transport, the ebbs and flows of the cycling biography, and how everyday mobilities function through dynamic networks and relationships.

Like many other participants over 60, Caroline grew up in a time when the bike she owned was considered a luxury item rather than a common good. She used her bike to go to various schools and short-term jobs. After she married at 21, she walked to work and rode as a passenger in her husband's car, leaving the bike for occasional trips to shops or friends within the city. Her cycling decreased further throughout her 30s, as she travelled more frequently with her husband and took the train to work after changing jobs, until she fully gave up cycling in her early 40s. From this period, Caroline recalls:

> "We became too heavy, too fat, come on! [makes sound of disgust] (…) I noticed we really, [my husband] had difficulties walking and I became too heavy, so I said: 'let's put an end to it. Now we go to buy a bike and get moving again'."

She gradually began to cycle more journeys for both utility and leisure, and finally established a daily cycle-commute of about 7.5 kilometres to Rotterdam's city centre. The relative ease with which Caroline resumes a pattern of everyday cycling reinforces the suggestion of a blurring of cycling mobility identities. Despite not cycling for many years it was wrong to 'categorise' Caroline as a non-cyclist. From learning to cycle at a young age and inhabiting a cycle-friendly environment, even as the passenger in her husband's car and reportedly unfit, she maintained the potential to resume cycling at any time. When Caroline's story is brought up to date, her personal history intertwines with her cycling practices even more closely. From the extract from her LHG presented in Figure 3 it is apparent that Caroline has experienced several challenging life events, broadly associated with getting older: the loss of a paid job, retirement, widowhood, and reduced mobility from injuries. Paradoxically, this period coincides with her claims to have cycled more than ever, despite losing her commute, twice needing to recover from falling off her bike and sustaining injuries. From the near simultaneous loss of her job, and then her husband, Caroline recalls:

> "Well, my whole world collapsed, I had nothing then. (…) At that time I started cycling a lot. To do something nice, let's say to get some fresh air into my head. I cycled a lot, walked a lot. I was looking for a bit of an outlet, have a nice ride, be busy. And today I have to say there's not a single day I'm bored."

Caroline's story shows how renewed possibilities appear as she ages, re-engaging with cycling habits that were previously normal-but-dormant. This relational normalisation of

	2010	2011	2012	2013	2014	2015	2016
Age	60	61	62	63	64	65	66
Life events			husband passed away				mother (91)
			out of work	official retirement			passed away
						care mother	
Cycling	to work	bike fall - shoulder recovery		fall at train station			
	to family	(5 months no work)					
					shops in whole nbh		
Other travel	together to town (metro)					occasional lifts, public transport	
Cycling - main purpose	commute		*"everything"*	*"therapeutic"* cycling			------>
				recreation/social: bike trips Gouda, Delft, Rijswijk			------>
				occasionally with husband's grandchildren			------>

Figure 3. Life history grid (LHG) Caroline, 2010–2016 extract.

cycling is shaped and disrupted by biographical events to reveal individually unfolding patterns of motivation. For example, Caroline explains renewed enjoyment of cycling in terms of positive self-image and feeling well by maintaining a healthy weight through regular exercise (see quote below). In addition, she experiences heightened awareness of the natural and built landscape through self-directed excursions by bicycle. This is evident in her choice to cycle independently rather than to accept invitations from friends to accompany them on similar excursions as a passenger in their car.

> "For the last 4 or 5 years all this movement helped me keep the same weight, and I'm happy with that. So that's also why I do it [cycling], for your health, your weight, because I like it, and because you see so much more."

Many other participant stories suggest a similar specificity and 'situatedness' whereby cycle paths and infrastructure are necessary but not sufficient – that would be difficult to generalise or to 'engineer for'. Flows of learning and habit-formation that constitute the unconscious normalisation of cycling are not separate (as if 'given' by cycling infrastructures and laws) but rather overlapping and interdependent with a web of situated sense-making. Specific circumstances, disrupted physical ability, and Caroline's personal resilience show how interdependent mobilities can establish an overall sense of 'wellness' that goes beyond the specific quality of any one particular (cycling) environment.

4.3. Nadine's story: collective mobility and moral obligation

Similar findings are revealed in Nadine's story, but for rather different reasons. Nadine's daily life, and that of her family household, illustrates the dynamic interplay between home, work, school and leisure mobilities widely reported elsewhere in household biographical mobility studies. Here we point to the subtly changing and negotiated role of cycling uptake in this meshwork of relations and mobilities, or 'negotiation in motion' (Jensen, Sheller, and Wind 2015), adding the ageing process to this. Viewed from an individual perspective, cycling plays a very modest role in Nadine's biography from the teenage years and through her 20s. At that time, Nadine's transport was centred first on taking the bus and then travelling by car. She explains:

> "It was an engrained habit, mostly laziness. I lived alone, I always had the car at my disposal, and worked irregular shifts. It was really a sort of habit, in fact I lived closer to work [then] than I do now."

When she started to raise a family in her 30s she describes feeling more motivated to cycle with her children to local destinations. She also switched from car to bicycle for her 9 km of daily commute. She offers a variety of reasons for increasing her cycling including the desire to set a good example to her children, a lack of parking availability at work, and increasing fitness concerns. She particularly enjoys her current freedom of choice to cycle, which is based on work shifts, social arrangements, convenience and the weather.

Viewed from a household perspective, Nadine's cycling behaviour is understandably influenced by other household members, though not because of directly linked movements to chaperone young children, as is usually described in 'linked lives' mobility studies (e.g. Bailey, Blake, and Cooke 2004). Nadine describes her partner Pim (63) as a keen athlete, frequently commuting his 14 km by bike and training for marathons in his spare time. Nadine acknowledges his demonstration of fitness and cycling longer distances as a positive example she wishes to emulate as she approaches retirement age. Then there is the example she continues to set for her children, now young adults. Nadine describes the lengths she went to, encouraging her daughter Kara (18) to cycle:

> "She never really liked exercising, already since she was little. Well, then you have to show it of course: yes, this is a part of us, you know. Not all the time in the car. (…) You have to set the right example yourself."

This in turn highlights the situatedness of relative dispositions towards cycling and cycling normalisation processes within a web of networks: of social and kin relations; of resource provision; and of information, knowledge and learning (Jarvis 1999, 226). Combining Nadine's story with the recorded activity patterns of her household members illustrates the dynamic interplay of collectively negotiated cycling behaviour – not only as physical locations but also through cycling habits witnessed by others and normalised in the household milieu. Figures 4 and 5 display these collectively negotiated mobilities at the city-level, whereas Figure 5 itself suggests the influence of Nadine's sense of 'moral obligation', setting a good example as a conscientious parent. Echoing the theme of ordinariness, the figures show multi-modal patterns, which embed cycling as part of (chained) utility trips (frequency counts are included in the legend).

The integration of individual and collective patterns of negotiated mobilities, including cycling, underlines the mundane nature of cycling alongside the interchangeable nature of multiple travel modes. This illustrates that acknowledging and appreciating different travel options is neither incompatible with a 'high-cycling' context nor does it appear over time to disrupt the blurring of cycling and non-cycling identities. Cycling is normalised in Ommoord in a subtle way that does not reduce 'successful' mobility to a single transport mode, as a mature mode alongside car use.

The bicycle occupies a taken-for-granted position of blurred identities, intermingling with multiple other activities and modes that constitute Nadine's daily mobilities. For example, she indicates that cycling has no purpose beyond the utility of getting to and from work, overlooking the way it provides a significant source of physical fitness, defining exercise as a separate activity for the gym:
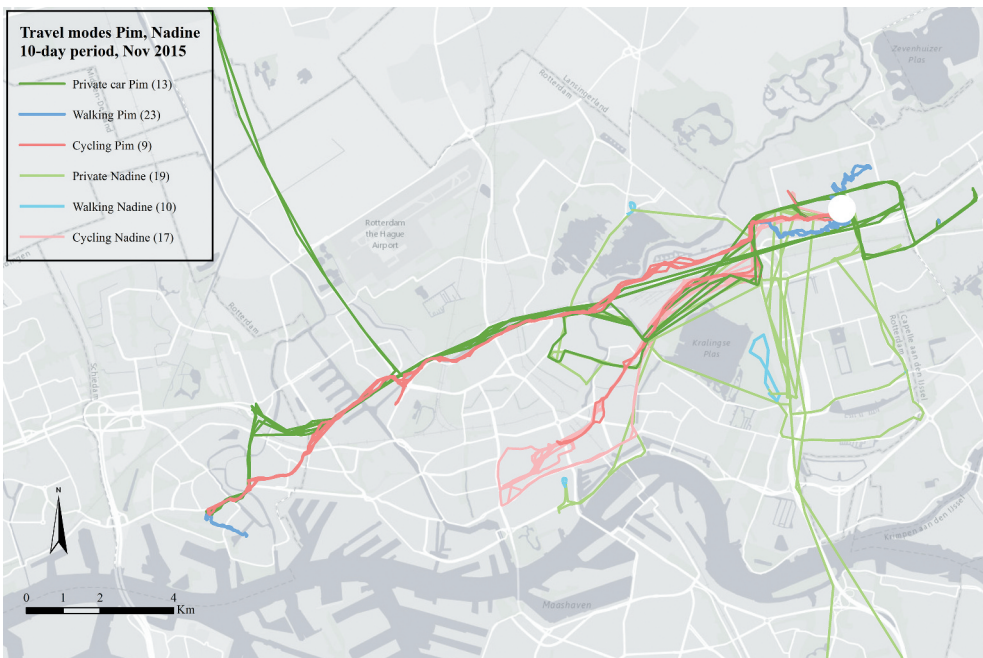
Figure 4. 10-day recorded activity pattern of Nadine and Pim combined.

> "So two days a week I cycle to work, that is 20 km [36 km in reality] on top of my other exercise so I don't think that matters a lot."

The collective constitution of Nadine's cycling behaviour, together with strong links to the wider lifecourse (enacting positive family role models), serves to illustrate the (unconscious) social-relational aspects that are at play in the everyday mobilities of a high-cycling context. Likewise, discussing these factors in relation to the ageing process shows the importance of the lived experience of these mobilities. As with Caroline's story above, they illustrate a wider theme of rhythms and disruptions that are negotiated in the context of daily life.

5. Conclusion and discussion

5.1. Discussion

From the active and reflexive tracing of cycling normalisation in individuals' biographies, we analysed key themes of ordinariness, positive ageing, and collective arrangements in Dutch cycling. This offers a perspective on cycling – and mobility in a wider sense – that is rooted in the changes and continuities of the lifecourse. Events and decisions arise as incremental processes as people get older, or as their physical or social surroundings change. We observe a taken-for-grantedness that cannot be replicated in aspiring cycling environments. In an ordinary (non-paradigmatic) Dutch context we find cycling to be so normalised, population-wide, that distinctions that would otherwise be made between cyclists and non-cyclists, based on cycle use at a certain stage of life, are culturally blurred and fluid over time and space. Cycling normalisation
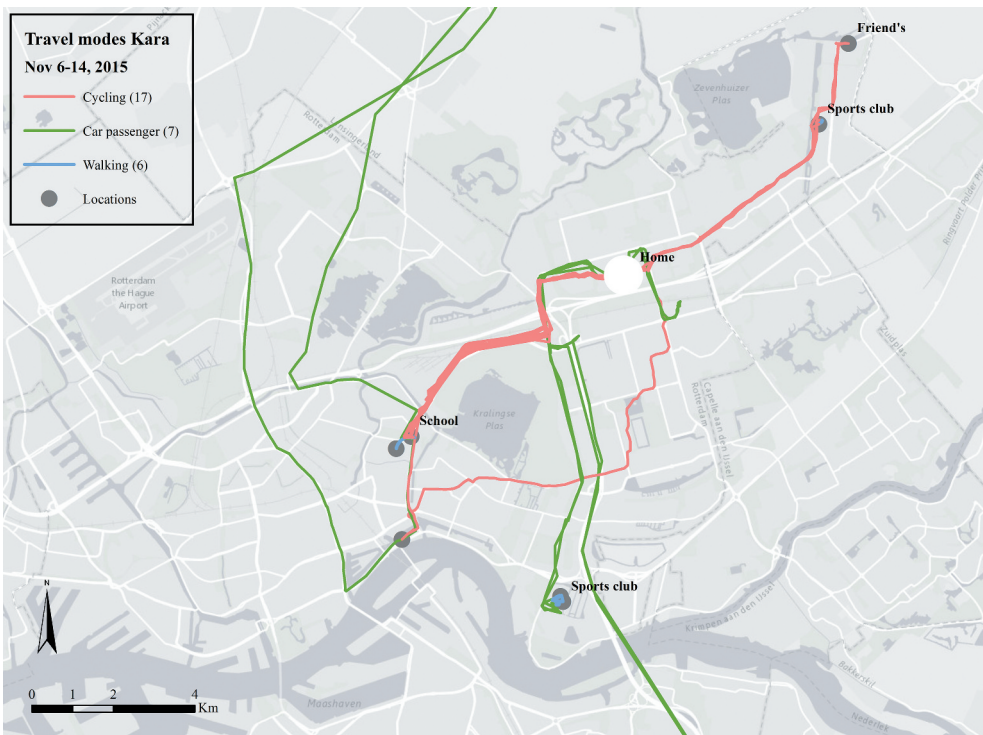
Figure 5. Recorded activity pattern of daughter Kara.

is shown to be more socially varied and locally constituted than usually inferred from extreme-cycling stereotypes. Choosing cycling, relative to other modes of transport, is compatible with dominant social cultural norms. What differentiates the Dutch case is not its cycling culture per se, but rather the ordinariness of cycling as part of everyday mobility (Aldred 2015; Stoffers 2012). Arguably, if we are to deepen our understanding of the social processes of cycling normalisation from a situated lifecourse biographical perspective, we need to take the social reproduction of mobility habits more seriously (Bissell 2015; Manderscheid, Schwanen, and Tyfield 2014). This entails looking at the way that cycling habits are formed, maintained, or disrupted in ordinary (sub)urban settings.

Our results show how the normality of cycling plays out in the life of 24 adult participants, including those of older ages neglected by active travel and mobility biography research. Our thematic analysis sheds light on the nuanced set of interactions between transport, health, the built environment and 'all that it takes' in a practical sense for individuals and groups to take up or resume cycling as a routine habit and expression of active agency. This contrasts with the way that cycling is typically conceived as merely an active mode of transport and a means of getting from A to B. Connections between mobility and the sense of getting older are especially striking. Yet, perceptions of ageing are not continuous or linear, as we illustrate in the vignettes above. Rather, cycling biographies are characterised by variation, changing rhythms, and disruptions. Cycling is itself embedded in a wider 'logic of possibility' both with respect to multiple transport

options and in terms of the negotiated influence of other household members (Jensen, Sheller, and Wind 2015).

All this highlights the significance of 'taken for granted' norms and habits that together represent a combination of purposeful and unconscious action. Our biographical, relational approach recognises that individuals respond to key events and changing longer-term circumstances throughout their lifecourse and in daily life with reference to their local social and material situatedness (c.f. Müggenburg, Busch-Geertsema, and Lanzendorf 2015). The findings highlight insights that can only be gained from triangulating multiple methods of observation and analysis. Following Lee (2016, 403) we recognise the added value of mobile methods that focus on "knowing through doing", to help us to understand mobility more holistically to counter the way that "(…) existing bicycle behaviour research usually emphasises infrastructural solutions."

Lastly, the findings demonstrate the circumstances under which cycling is "suitable for large segments of the population" (Götschi, Garrard, and Giles-Corti 2016, 46). The resulting cycling patterns are the fruit of lifecourse developments and decisions, in which independent mobility contributes to wellbeing and positive ageing in a variety of ways beyond mode of transport. These include opportunities to make pleasant trips, by whichever means of transport, or access outdoor environments, social interactions, and participate in civil society. The suitability of cycling in older age is thus derived from convenience, contributing to embedded physical, mental and social wellbeing. When cycling is less visible, and less prevalent in early-years education and everyday family life, the positive associations between cycling and wellbeing will remain underdeveloped.

5.2. Policy implications: learning from the Dutch experience

We argue that it is not sufficient to imitate a paradigmatic cycling city. In Ommoord, Rotterdam, we find qualitative attributes of lifelong everyday cycling that cannot be explained with reference either to hard cycling infrastructure design and investments, or cycling services alone. For this reason, we caution against the instrumental emulation of observable practices, which too often prioritise high-tech solutions over the situated cultures and biographies that make Dutch cycling a'quasi-natural phenomenon' (Van Duppen and Spierings 2013; Stoffers 2012). Instead, policymakers should emphasise the softer elements that promote cycling as part of everyday mobility.

Policy learning should aim to translate context-specific lessons and acknowledge multiple intersecting factors of cycling habit formation and normalisation. Prior research has shown how most older adults in the UK learned to cycle in childhood, but can become reluctant, resilient or re-engaged in cycling in later life. Those who do re-engage may do so in very limited ways, spatially and temporally, by choosing quiet periods of the day and off-road paths (Jones et al. 2016). To establish a critical mass, policy interventions may target streets and neighbourhoods to be functionally and aesthetically attractive to live and socialise in, and in which cycling's qualities are 'within reach' of all ages. When cycling is safe, normalised and part of daily routines, it is found to be socially inclusive with respect to age, gender and income, while the largest health benefits accrue for those who move from low to moderate physical activity levels (Götschi, Garrard, and Giles-Corti 2016; Sallis et al. 2004). For an activity to be 'normal' it has to be so routinely taken for granted

that it passes without comment. While outside observers might describe the Dutch as keen cyclists, the participants in this study rarely view themselves this way.

We show that routinely negotiated practices of everyday mobility and cycling's qualities are closely aligned with the wider ambitions of the AFC initiative. The findings provide empirical support for the notion that AFC policies could benefit from conceiving transportation beyond automobility (Murray 2015), to create a normalised active mobility environment that accommodates diverse preferences and abilities over the lifecourse. Lastly, AFC research should consider a mix of narrative data and mobile methods – as adopted here – to better understand the interplay of ageing and lifecourse with relational and practical dimensions of everyday life.

5.3. Conclusions

In this study, we recognise multiple social and cultural processes that influence cycling normalisation, beyond the visible presence of cyclists out on the road. This less paradigmatic cycling city case included insights on cycling normalisation that came ostensibly from non-cyclists. In this 'ordinary' high-cycling context we found that: the definitions of cyclists and non-cyclists are blurred; cycling biographies are non-linear; little attention is paid to the accessories that might identify the cyclist (bicycle brands, wet-weather gear, technical equipment) or to the material environment (cycling infrastructure); participants have invariably cycled at some point, and may expect to resume cycling in later life due to its embedding in the lifecourse; cycling normalisation is cultivated in residential areas and on non-central routes. In addition, cycling benefits are embedded in complex individual and collective arrangements. We have shown in this paper that the practice of ageing represents a changing experience of opportunities throughout life. On that basis, it is unhelpful to privilege ages or distinct life stages when conceptualising and implementing future AFC initiatives.

Cycling mobility remains socially, culturally, and physically marginalised in many western countries, not only as a low share of all journeys, but also due to the generalised perception that cycling is risky or 'only for sporty people' (Goodman, Green, and Woodcock 2014). The uptake of cycling is understood to have to exceed a threshold of critical mass, what we refer to as normalisation, to bring about an enduring transition from low-cycling to high(er) cycling. At low levels, below a certain threshold or tipping point, cycling is consciously self-identified rather than unconsciously normalised. This explains why UK planners and policy-makers emphasise the need to increase the uptake, so that the cyclist feels less isolated on the roads (see Aldred, Woodcock, and Goodman 2015). Yet, we argue that increases in the overall share of cycling trips are necessary but not sufficient for cycling to be normalised across the population. The results of our study suggest that for low-cycling cities to transition to a high-cycling share of distance travelled, as part of an age-friendly city, attention should be paid to 'soft' social-relational as well as 'hard' contextual factors. Cycling normalisation thus incorporates "a convenient form of everyday travel rather than a vigorous form of sport and exercise" (Garrard, Handy, and Dill 2012, 229), whilst supporting confidence, wayfinding, and social and mental wellbeing opportunities.

The transition from low- to high-cycling cultures and practices is contingent upon co-constitutive changes, such as with cycling identity, social and material infrastructures

that shape the logic of the situation, and social changes around perceptions of risk and social inclusion. By implication, the challenge is to adopt not only a fully-featured cycling infrastructure, but also to understand and deliver ways to make cycling as socially and spatially inclusive as possible (Lam 2018). Reflecting on the policy recommendations previously suggested by Pucher and Buehler (2008), our study suggests that priority should be given to the preferences of older cyclists, including their infrastructural needs, but also in coordination with other attributes of (all) age-friendliness (Figure 1). Cycling, among other forms of mobility, should be imagined as a logical extension of the human capacity to move independently, or with minimal engineered (electric) assistance, as 'pedestrians on bikes' and, beyond this, to extend cycling services in ordinary suburbs as well as major town and city centres.

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Appendix

Table A1. Background details of participant sample.

Participant	Age	Household1	Employment	Car access	Cycling trajectory2	Main mode
Nicole (f)	60	C	Retired	Y	Resilient	B
Karin (f)	74	S	Retired	Y	Resilient	B
Peter (m)	71	S	Retired	Y	Reluctant	PT
Evert (m)	63	S	Fulltime	N	Resilient	B
Berdien (f)	65	C	Part-time	Y	Resilient	B
Nina (f)	63	C	Fulltime	Y	Re-engaged	C
Karel (m)	66	C	Retired	Y	Resilient	B
Fleur (f)	68	S	Part-time	N	Resilient	PT
Nadine (f)	51	C,2ch	Fulltime	Y	Re-engaged	C
Pim (m)	63	C, 2 ch	Fulltime	Y	Resilient	C
Bram (m)	63	C	Part-time	Y	Resilient	C
Caroline(f)	66	S	Retired	N	Re-engaged	B
Victor (m)	68	C	Retired	Y	Resilient	B
Thomas (m)22	C,2 ch	Student		N	Resilient	B
Gilles (m)	44	C, 1 ch	Fulltime	Y	Re-engaged	B
Kara (f)	18	C, 2 ch	Student	N	Resilient	B
Sanne (f)	70	S	Retired	Y	Reluctant	C
Carla (f)	46	C, 1 ch	Fulltime	Y	Resilient	B
Yvonne (f)	70	S	Retired	Y	Reluctant	C
Vera (f)	76	S	Retired	Y	Reluctant	PT
Tessa (f)	26	C, 1 ch	Fulltime	Y	Reluctant	C
Henk (m)	64	C	Retired	Y	Re-engaged	B
Susan (f)	62	C	Retired	Y	Reluctant	C
Bart (m)	47	C, 2 ch	Fulltime	Y	Resilient	C