Facilitating a Contested Practice:

Building and growing urban transport cycling in Santiago de Chile

A thesis submitted to the University of Manchester for the degree of
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Abstract

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This research aims to achieve a better understanding of interventions in the trajectories of practices. It is based on a case study of transport cycling in Santiago de Chile. The research uses a practice approach combined with concepts from Science and Technology Studies in order to explore the practice of transport cycling and examine interventions aimed at increasing the modal share of cycling in Santiago. The research is based on qualitative data from semi-structured interviews, participant observation, photography and document analysis.

While transport cycling is a recognisable practice in Santiago, it is also the site of several conflicts. The stigmatisation of cycling in its recent history as mode of transport for the most marginalised part of the urban population is challenged by new images of cycling as environmentally-friendly, healthy mode of transport for young professionals. As cycling becomes more popular, conflicts over the location of cycling emerge with motorists as well as pedestrians. Finally, different performances and understandings of cycling have generated conflicts among the urban transport cyclists. By focusing on relations between practices, the research thereby brings to the forefront the contested nature of practices which has so far been underemphasised in practice research.

The research then focuses on interventions in the trajectory of urban transport cycling in Santiago, how they are developed and how they take effect. The research identifies two categories of interventions: *building practice* and *growing practice*. Building practice is the government-led provision of material infrastructure for cycling, while growing practice is led by civil society and includes a variety of small-scale interventions in the everyday engagement in the practice.

The research argues that building practice produces infrastructure which is developed within the dominant system of automobility and is shaped by and reflects the inherent conflicts of the practice. Growing practice interventions are shaped by the core of the community of practice. They do not only provide targeted support for individuals, but more importantly contribute to the creation of a community of practice.

This research aims to contribute to practice research by proposing a relational perspective for the analysis of practices, which emphasises five relational dimensions of practice: the individual situated experience of the performance in which meaning is created, the socio-technical system in which the practice is embedded, the relations between co-existing practices which bring to the forefront the contested nature of practices, the material infrastructure which emerges from the socio-technical system and shapes the performance of the practice, and finally the community of practice which constitutes practice and may be able to grow practice.

Declaration

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List of Abbreviations

FNDR	*Fondo Nacional de Desarrollo Regional* National Fund for Regional Development
GEF	Global Environment Facility
GORE	*Gobierno Regional Metropolitano de Santiago* Metropolitan Regional Government of Santiago
I-CE	Interface for Cycling Expertise
MFC	*Movimiento Furiosos Ciclistas* Movement of Furious Cyclists
MidePlan	*Ministerio de Planificación* Ministry of Planning
MINVU	*Ministerio de Vivienda y Urbanismo* Ministry of Housing and Urbanism
MLP	Multi-Level Perspective
REDEVU	*Recomendaciones para el Diseño de Elementos de Infraestructura Vial Urbana* Recommendations for the Design of Elements of Urban Road Infrastructure
SCOT	Social Construction of Technology
SECTRA	*Secretaría de Planificación de Transporte* Secretariat of Transport Planning
SERVIU	*Servicio de Vivienda y Urbanización Metropolitano* Metropolitan Housing and Urbanisation Service

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A project such as this has one auther, but is really the work of many. Therefore, I would like to take this opportunity to express some thanks.

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Chapter 1: Introduction

This thesis is about the fundamental question of how to change what people do. The call for behavioural changes is not new, but the seriousness of the threat of climate change (see Stern, 2007) and the recently emerging obesity crisis have brought new urgency to the challenge of how to intervene in human activity. Governments have made attempts to inform and encourage, to regulate and enforce, to incentivise, or most recently to nudge people into more sustainable and healthy behaviours. However, behavioural changes have mostly been incremental (Southerton, McMeekin and Evans, 2011). We still face the challenge of how to fundamentally change currently normal but unsustainable consumption patterns and sedentary lifestyles.

The motivation for this research arises from a concern for sustainable urban development which was fuelled by the experience of working for an international development organisation in Buenos Aires, Argentina, on the regeneration and sustainable development of an urban river basin area which included considerable infrastructure investment. The present research project was significantly shaped by three observations from this experience, regarding the challenges of urban growth, the explanation of human behaviour and the nature of infrastructure development, which I will present in the following paragraphs.

First, living in a megacity gave me an appreciation for the challenges of rapid urban expansion and population growth. Today, more than half of the world population lives in urban areas. In the upcoming four decades, the urban population is expected to increase further, passing from 3.6 billion in 2011 to 6.3 billion in 2050, which will be around two thirds of the expected world population in 2050 (United Nations, 2012). This increase is expected to be concentrated in the global South. While it is generally accepted that this expected growth presents many challenges in terms of sustainable development, the high population density in urban areas has also been seen as an opportunity for sustainable development, for example in terms of lower per capita energy usage for transport (see Van der Waals, 2000).

The setting of this research is Santiago de Chile, a city which, as many other cities in the global South, is expanding and simultaneously experiencing intraurban migration from the city centre to the densifying periphery (Ferrando, 2008). This process has normalised longer commutes to employment opportunities and services which are still concentrated in the

city centre. As a result, Santiago experiences severe traffic congestion as well as air and noise pollution (Ministerio de Vivienda y Urbanismo, 2008; Jhun et al., 2013).

This thesis will focus on urban transport cycling in Santiago. While the urban transport debate has for a long time focused on the provision of infrastructure for motorised transport, active transport has recently attracted attention. Today, academic research as well as policy recommendations from international organisations agree that cycling should be considered a serious transport alternative (UN-Habitat, 2013). Cycling is promoted as environmentally-friendly mode of transport, as healthy exercise, as economic access to destinations, activities, services and goods, and as tool for the transformation of public space. Cycling is therefore portrayed as response to several pressing social issues, including climate change, obesity, urban poverty, and deteriorating life quality in cities.

It is not surprising that there has been a wave of research and policies aimed at getting more people on bicycles. Statistics show that the share of cycling trips in total transport varies considerably between cities. While many cities exhibit barely any cycling, in Groningen, The Netherlands and Copenhagen, Denmark the bicycle has achieved modal shares of 39 and 29 percent, respectively (Pucher and Buehler, 2008: 500). These statistics give an idea of the enormous potential benefits that could be achieved if cycling could be facilitated. However, to date many cities struggle to increase cycling rates.

In view of the overwhelming individual as well as social benefits of cycling, the question first and foremost is not how to get more people on bicycles, but rather why do so many people not cycle. This question links to the second observation which I made during my work in Buenos Aires: people's actions seemed unpredictable and 'irrational' to me as outsider and only started to make sense with a growing understanding of the local reality.

What determines people's behaviour has been the focus of multiple fields of academic research. Today, the debate is dominated by behavioural approaches which focus on the individual and choice determined by economic incentives, attitudes, knowledge and social norms amongst others. A relatively new field are theories of practice which reject the atomistic view of the individual and the linear causal relationship between external factors and behaviours (Shove, 2010). Rather, behaviours are understood as part of the performance of practices, which are arrays of human activity, organized around a shared practical understanding, mediated by material arrangements and embedded in complex arrangements of co-existing practices and their material arrangements (Schatzki, 2001;

2011; Shove and Southerton, 2000; Shove, Pantzar and Watson, 2012). Practice theories conceptualise individuals as carriers of practices. Practices are reproduced and developed through performance by which carriers create and negotiate the meaning of the practice (Wenger, 1998).

According to practice theories, interventions in the trajectory of a practice need to acknowledge the embeddedness of practices in a local arrangement of co-existing practices and their material arrangements, which normalise certain practices and marginalise others. In turn, interventions need to acknowledge that people's actions are a response to interventions, not the result thereof, and always remain unpredictable (Shove and Walker, 2010; see also Latour, 1991; Wenger, 1998).

My third observation was that the provision of infrastructure is not merely a technical or financial problem, but characterised by political negotiations and institutional struggles in which problems as well as solutions are constructed. The Science and Technology Studies literature has made a great effort to deconstruct processes of technology development and show that technological development does not follow a linear path, ending in the optimal solution (Pinch and Bijker, 1984). According to this literature, the final outcome of technological development is the result of political negotiations, power struggles and contingencies. It is not given from the start and does not necessarily represent the most efficient solution (Schwartz Cowan, 1985; Law and Callon, 1988; Bijker, 1995).

These findings then require a new perspective on interventions in the trajectory of a practice. Practice theories have so far focused on how interventions take effect as part of complex arrangements of co-existing practices and their material arrangements. The Science and Technology Studies literature broadens the perspective to take into account the genesis of interventions, how interventions are negotiated and shaped as part of current socio-technical systems. This new perspective will help me to explore how interventions aimed at facilitating cycling are developed within and as part of a mobility system dominated by motorised transport.

In conclusion, the motivation behind this research is not the question how to convert people into 'eco-heroes', who practice urban transport cycling whatever the conditions, but rather how to *facilitate* the practice, how to make cycling normal and the most convenient mode of transport. Based on a practice approach and selected concepts from Science and Technology Studies, this research acknowledges that what we do is not merely

a matter of choice but the performance of practices which are embedded in complex socio-technical systems of numerous co-existing practices and their material arrangements. Interventions are not external to the socio-technical system, but are products of political negotiations within the socio-technical system and take effect as part thereof. Facilitating a practice then requires socio-technical transitions which normalise and thereby make it easy to engage in the practice.

1.1   Research aims and questions

This research therefore aims to achieve a better understanding of interventions in the trajectory of a practice and to contribute to practice theory and current debates on interventions in the trajectories of practices. These two aims can be translated into the following research questions:

1) What is transport cycling in Santiago?
2) What kind of interventions in the trajectory of transport cycling can be observed in Santiago and how do these interventions take effect?
3) How are interventions developed, planned and designed?
4) What can the case of transport cycling in Santiago contribute to the conceptualisation of practices and current debates on interventions in the trajectory of a practice?

1.2   Outline of the thesis

This thesis is structured into nine chapters. Following this introduction, chapter 2 will develop a theoretical basis for the research from the existing literature. The first part of the chapter will focus on theories of practice. A short history of practice theories will position this research within the theoretical frame developed by the second generation of practice theories. I will then present concepts of practice and current debates with regard to the boundaries of practices, their trajectories, and the community of practice. These concepts will frame the analysis of urban transport cycling in Santiago.

The second part of the chapter will introduce several approaches to interventions in human activity. I will start by outlining behavioural approaches which focus on the individual and her capacity for choice. I will then turn to four policy approaches based on practice theory proposed by Shove, Pantzar and Watson (2012) which will be used as reference points throughout the thesis. In view of the significant role of the material infrastructure in shaping the practice of cycling, I will finally turn to three concepts from Science and

Technology Studies (STS) to complement the theoretical basis for the analysis of material interventions. I will first turn to actor-network-theory and borrow the concept of scripts in order to be able to describe the way cycling infrastructure shapes the practice of cycling. I will then turn to a social-constructivist approach to technological development which will contribute to the analysis of the planning process of cycling infrastructure. Finally, I will turn to the literature on socio-technical systems and path dependency. I will use this concept to analyse the currently dominant system of automobility (Urry, 2004) and the relationship between cycling and driving. Finally, I will review attempts to integrate socio-technical systems and the practice approach in order to strengthen the theoretical basis for the analysis of interventions in transport cycling as practice within the urban mobility system.

In chapter 3, I will first explore the literature on transport cycling with a practice lens in order to establish what constitutes cycling as a practice. This part will argue that practice theories are a useful lens through which to analyse urban transport cycling, but they are also challenged by this practice. While practice theories allow the conceptualisation of cycling as a situated and embedded practice mediated by its material arrangement, practice theories struggle to accommodate the differences in understanding and performances of cycling, the disagreements as to the rules of the practice, and the lack of mutual engagement and joint enterprise among the community of practice. While cycling is a recognisable practice, it might require a more flexible definition than the ideal type concepts developed in some practice theories.

The remaining part of the chapter will focus on interventions in cycling. I will first provide a brief summary of the benefits of cycling as justification for the effort of intervening in the trajectory of cycling. I will then turn to selected common concepts and approaches which were relevant in the field: the concepts of barriers to cycling and cycling culture and the approaches of cycling campaigns and cycling infrastructure. Finally, I will use the practice approach and the STS concepts presented in chapter 2 to introduce three perspectives for the facilitation of cycling: first the acknowledgement of the significance of small-scale interventions in cycling, second the importance of the relationship between driving and cycling, and third the embeddedness of cycling in the socio-technical system of urban mobility. These thoughts are not intended as a recipe for the facilitation of cycling, but rather as new perspective and reference points for the rest of the thesis.

Chapter 4 will first reiterate the research questions. The chapter will then detail the research approach and methodology. The research is based on a social constructivist research paradigm and follows an inductive research approach based on the methodology of naturalistic inquiry and grounded theory. The research is based on an in-depth single case study on the promotion of cycling as a mode of transport in Santiago and uses various methods of data generation, including interviews, participant observation, photography and document analysis in order to provide a rich basis of qualitative data for the analysis. I will then critically reflect on the fieldwork, the problems and necessary adaptations of the research methods as well as my role as a researcher. The chapter will then detail the method of analysis and writing, which have been carried out in an iterative process parallel to and after the fieldwork and were supported by qualitative data analysis software. I will conclude this chapter with a reflection on the limits of the research approach.

The chapters 5 to 7 will present the empirical material from the case study. In chapter 5, I will explore the practice of cycling in Santiago. I will argue that cycling in Santiago is a particularly contested practice, characterised by several inherent conflicts. In the first part, I will focus on the recent history of cycling in Santiago, in which several conflicts can be traced in developments and events: struggles over the image of cycling, competition for public space between cycling, driving and recently walking, and the dispute within the community of practice with regard to a joint enterprise in the form of policy demands as to regulation and specialised cycling infrastructure. The second part of the chapter will examine the practice of cycling. It will first focus on the general population and explore understandings and contested images of cycling with which cyclists are confronted. I will then show the fragmented nature of the community of practice which results in different interpretations of the rules of the practice and different performance styles as well as different positions as to cycling infrastructure. The last part of the chapter will focus on the city as socio-technical system in which cycling and driving are embedded. I will argue that despite severe urban transport problems driving is prioritised which is expressed in the Traffic Law as well as the road infrastructure. I will conclude with a summary of the conflicts presented in the three parts. I will argue that cycling is a contested practice because these conflicts have become an inherent part of the practice.

Chapter 6 will focus on the provision of specialised material infrastructure for cycling as the most common approach to facilitating cycling in Santiago. I will argue that the conflicts between cycling and driving identified in chapter 5 are reflected in the planning and design

of the infrastructure. The chapter will first present a typology of cycleways. I will argue that the location of a cycleway expresses the prioritisation of a particular mode of transport. I will then introduce four case studies of cycleways on which the remaining analysis is based. The main part of the chapter will then focus on the planning and design of cycleways. I will first introduce five myths about cycling and cyclists which shape cycleway design. I will argue that rather than a technical process, the design is a political negotiation which is significantly influenced by the dominance of driving and by the understandings of cycling and its role in the transport system of the city. Then, I will use the Social Construction of Technology (SCOT) approach to identify four relevant social groups and describe their role in the planning of cycleways, their problems and solution strategies in the process. I will argue that the fragmented institutionality responsible for the planning of the cycling infrastructure allows for technical units to continue prioritising car flow. Finally, I will focus on two negotiations of the solution strategies, which show attempts to stabilise cycleway design.

In chapter 7, I will focus on activities targeted at providing specific support to cyclists in order to maintain practitioners who are encountering difficulties or to integrate and instruct new practitioners. The first part will focus on certain areas of the practice which can pose a problem for doing cycling and the activities that organisations carry out in order to provide support. I will focus on four areas: acquiring a bicycle, bicycle maintenance and repairs, learning to ride, and cycling in urban traffic. I will argue that the small scale interventions which I could observe in the field are capable of providing tailored solutions to individual cyclists and are therefore valuable. In the second part of the chapter I will explore the side effects of these targeted support activities. I will argue that the interaction between experienced and inexperienced cyclists contributes to building a community and creating a shared understanding of the practice.

In chapter 8, I will discuss the empirical chapters with regard to their contribution to practice theory. I will argue that the case study of urban transport cycling reveals the situatedness of practices in contrast to the ideal type conceptualisations in some practice theories. I will argue that practice theory could benefit from a relational perspective which could connect the individual situated experience of performance with the meso-level practice approach and the systems perspective. The relational perspective would also contribute to foregrounding the contested nature of practices by emphasising the relations between practices within a socio-technical system. The second part of chapter 8 will focus

on the two approaches to facilitating cycling, building practice and growing practice. I will argue that building practice is a political process which is shaped by the dominant system of practice, here the system of automobility centred in the competing practice of driving, and can therefore result in suboptimal results for the practice which is to be facilitated. On the contrary, small-scale growing practice activities are shaped within in the community and do not only provide targeted support, but also contribute to strengthening the community of practice, integrating and instructing new members and shaping general understanding.

Finally, chapter 9 will conclude the thesis by returning to the research aim and the research questions presented above. I will summarise the concepts of contested practice, building practice and growing practice and how these concepts can contribute to current debates in practice theory. I will then reflect on the limitations of the research and propose two areas for further research on transport cycling in Santiago. First, I suggest that focusing on the traditional cyclists in Santiago would give a voice to a marginalised group within the cycling community and could contribute to an understanding of practice survival under adverse conditions. Second, I suggest that a focus on women cyclists, an underrepresented demographic group, could contribute to an understanding of the normalisation of urban transport cycling, especially the normalisation of more complicated cycle journeys beyond the simple commute to work. I will conclude the thesis with some tentative policy recommendations.

Chapter 2: Literature Review – Theoretical approaches

This chapter provides a critical review of the literature relevant to the question of facilitating urban transport cycling in order to position the research in the existing knowledge and to build a theoretical foundation for the following chapters of this thesis. The chapter is structured in two parts. In the first part, I will delve into theories of practice, which are the main foundation for this research. In the second part, I will review diverse approaches to interventions in human activity: a brief outline of several behavioural approaches will serve to distinguish the approach taken in this research from those widely used concepts; a critical review of practice approaches to policy interventions will show the current state of the debate in that field; finally, a brief outline of three selected concepts from Science and Technology Studies (STS) will complement the practice approach where this remains underconceptualised. While theories of practice are the foundation for this research, I will argue that the engagement with these selected STS concepts can usefully complement the theoretical foundation for the analysis of urban transport cycling.

I will start the practice review by outlining a brief history of practice theory and positioning my research within the second generation of practice approaches after the practice turn in contemporary social thought. The next section will present several definitions and concepts of practice and discuss the key elements of these concepts. The third section will discuss the lack of guidance in practice approaches with regard to the delineation of practice boundaries. I will argue that recognisability is crucial for identifying and meaningfully delineating a practice. The fourth section will review the approaches to conceptualising the trajectories of practices, how practices stabilise and how they change. This will be the basis for further thought on facilitating practices in the second part of the chapter. Finally, the fifth section will focus on the community of practice. The idea of a connection between all carriers of a particular practice has a certain appeal. However, practice theory has not yet fully conceptualised the characteristics of a community of practice and criteria borrowed from the social theory of learning (Wenger, 1998) appear rather too demanding for the variety of everyday practices.

The second part of the chapter will review theoretical approaches to interventions in human activity. I will first present selected so-called micro approaches, which originate mainly in environmental psychology and behavioural economics and focus on the individual

and the notion of choice. These approaches are the basis of many policy interventions today. However, micro approaches are criticised for their atomistic view of the individual and the linear causal relationship between external factors and behaviours.

Therefore, the remaining part of the chapter will focus on approaches which conceptualise interventions acknowledging the embeddedness of human activity. The second section will review four practice-based policy approaches proposed by Shove, Pantzar and Watson (2012), which address the elements of practice, the relations between practices, the careers of carriers and trajectories of practices and finally the social networks through which practices circulate. While these approaches introduce a new and useful way of thinking about policy interventions, there are three areas which need further conceptualisation: the relationship between material and practices; the development of interventions in the context of the current arrangement of co-existing practices and technologies; and the conceptualisation of practice interventions at the systems level.

In the third section, I will turn to three approaches from Science and Technology Studies which complement the practice-based approaches to interventions in the above mentioned areas. First, I will review the concepts of scripts, programmes and anti-programmes, which will provide a basis for the analysis of the way in which cycling is shaped by material arrangements. Then, I will turn to a social-constructivist approach to the development of technology which challenges the common concept of infrastructure as purely technical solution and, instead, conceptualises infrastructure as the result of political negotiations between social groups. This concept will be the basis for the analysis of the planning and design of cycleways. Finally, I will review the concept of socio-technical systems which will be useful for the analysis of the relationship between cycling and the 'system of automobility' (Urry, 2004) in the next chapter. I will argue that the three presented STS concepts can complement practice theories and provide useful perspectives for the analysis of interventions in the trajectory of urban transport cycling.

Finally, I will present Watson's (2012) approach to integrating the practice approach and the concept of socio-technical systems by recasting socio-technical systems as 'systems of practice'. This new perspective on socio-technical systems opens up the possibility to analyse large-scale transitions, while remaining grounded in the local embeddedness of everyday practices. The chapter will end with a summary and a conclusion in which I will outline the concept of 'facilitating a practice' as basis for this research.

2.1 Practices

This part of the chapter will provide a critical review of practice theories, present the key elements of practice theories as well as limits and current debates in order to establish a theoretical basis for the analysis of the case study. The first section gives a brief history of theories of practice which are divided into two 'generations'. The practice turn at the end of the 20th century and subsequent definitions from the early 2000s will be the basis for this research.

The second part will review the most common definitions of practice in order to extract the essence of the practice concept. Practices are recognisable bundles of actions, which include bodily and mental activities. They are inherently social and linked to material arrangements which shape the practice. Practices are reproduced and developed through performance, but exist between performances as collective resource.

The next three sections address current debates in practice theory all of which will be relevant for the discussion of the case study practice: how to determine the boundaries of practices, how practices develop over time, and how individuals form a community of practice. I will show the difficulties in delineating different types of practice boundaries and argue that practice boundaries should be determined empirically through the recognisability of the practice.

In the next section, I will show mechanisms of stabilisation and change. I will argue that although the practice approach has been criticised for its focus on reproduction and stability, it does conceptualise change. Practice trajectories are characterised by simultaneous stabilisation as well as innovation through performance.

Finally, the last section will shift the focus to the community of practice. While Wenger's (1998) social theory of learning provides a theoretical basis on learning and communities of practice, which remains underexplored in the practice literature, the conceptualisation of the community of practice seems rather demanding for the variety of practices of everyday life.

2.1.1 A brief history of practice theories

While the basis of practice theories can be found in the early twentieth-century works of Wittgenstein and Heidegger (see Schatzki, 1996; Shove, Pantzar and Watson, 2012), theories of practice become prominent in the social sciences as from the 1970s. Since then,

two generations of theories can be distinguished. The first generation is developed in the 1970s and 1980s. These theories introduce practices in order to address problematic dualisms (see Schatzki, 2001 for a summary of involved disciplines and dualisms). In social theory, the authors reject on the one hand the dominance of social structures and systems as explanation for social phenomena and on the other hand the individualist understandings of agency. In this context, practice theories are used to overcome this dualism and conceptualise a recursive relationship between structure and agency. In the late 1990s and early 2000s, we can observe a renewed surge of practice theories. Rather than instrumentalising practices like the first generation of theories, these authors establish practices as the fundamental unit of analysis in social theory (Warde, 2013: 18).

The main legacy of the first generation of practice theorists can be seen in the idea of a recursive relationship between structural constraints and human activity. Anthony Giddens (1979; 1984) is credited with the overcoming of the opposition of structure and agency in social theory through his *theory of structuration* which argues that '[t]he basic domain of study of the social sciences […] is neither the experience of the individual actor, nor the existence of any form of societal totality, but social practices ordered across space and time' (1984: 2). Simultaneously, Pierre Bourdieu develops an *Outline of a Theory of Practice* (1977) as well as *The Logic of Practice* (1990). However, despite these book titles, the focus of Bourdieu's work is not on practices as such, but on *habitus*, a system of dispositions in the individual which structures, generates and organises practices. While the focus of both authors is not directly on a conceptualisation of practice, these works introduce the idea of a recursive relationship between structural constraints and human activity, which will remain a central element of all subsequent practice theories.

Practice theories surge again in the last decade of the 20th century, mainly with Schatzki's (1996) *Social Practices: A Wittgensteinian approach to human activity and the social*. Schatzki makes practices the fundamental unit of analysis, thereby distancing his approach from earlier practice theories where practices are pre-determined and can therefore be explained at least partly by practical consciousness (Giddens) or habitus (Bourdieu) (Schatzki, 2002: 79). In more recent work, Schatzki argues that:

> 'nothing regarding teleology or motivation can determine or fix, prior to activity, what a person does or why. It is only with the occurrence of activity that what a person does and why become determinate. The indeterminacy of activity does not imply that what a person does is undetermined, or random. What a person does is determined by the ends for which he acts (teleology) and that in response to or in

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the light of which he does so (motivation). But that for which a person acts, as well as that in response to or in the light of which he does so, are not definite until he acts.' (2011: 5)

Because, according to Schatzki, there is no social phenomenon that determines practices, practices are the logical unit of analysis for social theory.

In view of the general success of neo-liberal thought with its focus on individual action and choice, these new practice theories present a fundamental opposition to a dominant paradigm, which has become the basis of most academic work in economics and psychology as well as policy approaches aimed at changing behaviours and lifestyles (Schatzki, 2001; Shove, 2010). Neo-liberal thought is based on the notion of a rational individual and focuses on choice as basis for behaviours. Research in psychology has added the conceptualisation of behaviour as the result of a linear causal relationship of attitudes, knowledge and behaviour. Practice theories reject these concepts as simplistic. Behaviours are not the result of linear causal relationships, but are parts of practices, which are emergent social phenomena, embedded in a local history, mediated by material arrangements and shared amongst the members of a community.

2.1.2   Conceptualisations of practice

Although practice theories agree in the central role of the practice, no agreement has been reached among the second generation of practice theorists as to a common definition of practice. This section will review the key elements of practice definitions.

In a synthesis of a central core of practice theories, Schatzki defines practice as 'embodied, materially mediated arrays of human activity centrally organized around shared practical understanding' (2001: 2). The central element of this definition is the notion of arrays of human activity. This notion refers back to Schatzki's most cited definition of practice as 'a temporally unfolding and spatially dispersed nexus of doings and sayings' (1996: 89). Practices are the bodily performance of multiple actions. These actions do not necessarily unfold at once or in the same place. They can be dispersed in time and space, but they are centrally organised and materially mediated.

According to Schatzki (2002), the actions of a practice are organised by practical and general understandings, rules and teleoaffective structures. Practical understanding consists of certain abilities which are linked to the bodily actions constituting the practice. The most important abilities are 'knowing how to X, knowing how to identify X-ings, and

knowing how to prompt as well as respond to X-ings' with X being the practice in question (Schatzki, 2002: 77). General understanding is a general view of the practice and the community of practice which can be expressed in the performance of certain actions as well as the manner in which they are performed (ibid.: 86). Rules are 'explicit formulations, principles, precepts, and instructions that enjoin, direct, or remonstrate people to perform specific actions' (ibid.: 79) and which people take account of and adhere to. Finally, the teleoaffective structure is a normative organisation of the practice, consisting of ends, which the participant in the practice should or may pursue, projects and tasks which the participant should or may carry out and perform to the particular end (ibid.: 80). These four structures organise the practice and in turn are reproduced and shaped by the performance of the practice.

Instead of conceptualising practices through the actions and organising structures, practices have also been defined as social phenomena consisting of several interconnected elements. Reckwitz defines a practice as entity consisting of 'forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge' (2002b: 249). Shove, Pantzar and Watson (2012) establish a similar concept, albeit a simplified version in order to make it manageable for the empirical analysis of practices. Here, practices consist of three linked elements: materials, competences and meanings. This tripartite structure is based on previous work where materials are also introduced as equipment, material objects or stuff; competences are also presented as or linked to skills and knowledge; and meanings are also referred to as images or ideals (Shove and Pantzar, 2005; Hand and Shove, 2007). Elements are relatively stable and independent entities, which can travel, as opposed to practices, which are dynamic entities embedded in a local context (Shove, Pantzar and Watson, 2012: 39). The links between elements can break down and elements can be joined in new combinations to develop innovative forms or new practices.

These two types of definitions, one focusing on the nexus of actions, the other focusing on interconnected elements of practice, describe an inherent duality of practices: practices simultaneously exist as performances and as entities (Reckwitz, 2002b; Shove, Pantzar and Watson, 2012: 7). The practice-as-entity consists of linked elements which constitute a recognisable entity. This entity is reproduced through performance. While the practice-as-entity can endure between performances, it is only through performance that the

constellation of elements is sustained and developed and that practices can emerge, stabilise and develop over time (see section 2.1.4).

All definitions coincide in that practices are *social* phenomena. Schatzki gives two reasons for this: first, participating in a practice entails co-existence with other participants and, second, the organisation of a practice, i.e. its ends, projects and affectivities, its shared rules and understandings, is expressed in each performance of the practice of the entire group of participants (Schatzki, 2002: 87-88). Reckwitz agrees with the argument of multiple participants as well as the notion of a shared understanding: 'A practice is social, as it is a 'type' of behaving and understanding that appears at different locales and at different points of time and is carried out by different body/minds' (2002b: 250).

However, in Schatzki's definition, the teleoaffective structure could at first sight appear to refer to the rational pursuit of an *individual* end. In this sense, a person could have a certain individual motivation and purpose to perform the practice. However, Schatzki clarifies: 'a teleoaffective structure is not a set of properties of actors. It is, instead, the property of a practice: a set of ends, projects, and affectivities that, as a collection, is (1) expressed in the open-ended set of doings and sayings that compose the practice and (2) unevenly incorporated into different participants' minds and actions' (Schatzki, 2002: 80). The teleoaffective structure of a practice establishes the correct and the acceptable actions which can be performed within the practice (Schatzki, 1996: 102). This range of actions is appropriated by each carrier of the practice through learning, where novices are 'brought into line' (ibid.: 101). Reckwitz expresses a similar conceptualisation of the mental activities: 'These conventionalized 'mental' activities of understanding, knowing how and desiring are necessary elements and qualities of a practice in which the single individual participates, not qualities of the individual' (2002b: 250). Practices are therefore inherently social.

Turning to the individual elements of practice, it is noteworthy that Shove, Pantzar and Watson (2012) as well as Reckwitz (2002b) include knowledge in the concept of practice. Contrary to behavioural models in psychology, however, knowledge here is not an independent factor influencing behaviour. Rather, knowledge is part of the practice and is shaped and reproduced by the performance of the practice (Shove, Pantzar and Watson: 144). Furthermore, the concept of knowledge in Reckwitz's (2002b) definition is broad, encompassing understanding, practical know-how and even emotions and motivations, which are not commonly regarded as part of the rational sphere of knowledge. This is

similar to Schatzki's teleoaffective structure, which also includes normativised emotions and even moods (2002: 80). Finally, knowledge as constitutive part of the practice (not as 'we-intentions of a group' (Schatzki, 2002: 81)) is collective and shared, 'which enables a socially shared way of ascribing meaning to the world' (Reckwitz, 2002b: 246).

Finally, although they differ as to the specific location of the material, the practice theories of the second generation generally assign special importance to material artefacts. These practice approaches were inspired by the 'material turn' in social thought and the rethinking of the subject/object dualism, both of which established the significant role of the material in practice theories. Reckwitz argues that practices 'consist not only of human beings and their 'intersubjective' relationships, but also simultaneously of non-human 'actants', things that are necessary and are so-to-speak 'equal' components of a social practice' (2002a: 208). This position differs from the practice theories of the first generation (see Bourdieu, 1977, 1984, 1990; Giddens, 1984) and also Schatzki's (1996) early work on practices, in which the status of material objects is somewhat neglected (Shove and Pantzar, 2005: 44; Reckwitz, 2002a: 210) as well as other cultural theories in Sociology in which material artefacts are generally conceptualised as objects of knowledge and thereby cultural symbols (Reckwitz, 2002b: 253).

While in later work Schatzki (2002, 2011) includes the material in his analysis, he does not include material artefacts in his definition of practice. For Schatzki, material artefacts remain external to the practice. In recent work, Schatzki (2011) establishes the concept of material arrangements, which include 'linked people, organisms, artefacts, and things of nature' (2011: 4). Practices and material arrangements then form practice arrangement bundles 'in that (1) practices effect, alter, use, and are inseparable from arrangements while (2) arrangements channel, prefigure, and facilitate practices' (ibid.). Schatzki's material arrangement appears to be a functional group, including all elements which can mediate practices. However, the elements of this group of 'mediators' appear rather indistinct.

With this difference in practice definitions, the question arises whether it is more useful to include material elements in the concept of practice or to conceptualise practices as nexus of actions, while the material arrangement remains 'inseparable' but still external to the practice. At first sight, Schatzki's concept seems useful to explore the notion of facilitating practice and possibilities to intervene in the dynamics of practices. However, the practice of cycling illustrates a possible limitation of Schatzki's concept. In Schatzki's concept, the

bicycle would not be part of the practice, but part of the material arrangement. The bicycle indeed shapes the practice and can facilitate or hinder its performance and, therefore, it can be seen as external to the practice. However, a practice is a recognisable entity (Shove, Pantzar and Watson, 2012) and in the case of cycling, it is the bicycle (or any substitute apparatus) in combination with certain bodily activities which makes cycling recognisable as a practice. This argument supports including certain essential material artefacts and their use in the definition of practice as argued by Reckwitz (2002b) as well as Shove, Pantzar and Watson (2012).

2.1.3 Boundaries of practices

A general problem in the conceptualisation of practices is the delineation of practice boundaries (see Harvey et al., 2012). While practice theory promotes practices as unit of analysis, I argue that it faces challenges with regard to four delineations of practice: the boundary of a practice trajectory in a temporal sense; the identification of the correct level of aggregation for the practice as unit of analysis; the distinction between differing performances and different practices; and finally the extent to which shared understanding is a requirement for the existence of a practice. In this section, I will discuss approaches to delineating these practice boundaries, and I will argue that the most crucial aspect for the delineation of a practice is its recognisability, which can only be determined empirically in a local arrangement.

First, from a temporal perspective, it is unclear how to determine the beginning and the end of a practice. Practices emerge, evolve and disappear. A practice emerges through the creation of links between elements. However, not all elements are new, such as innovative technologies. On the contrary, most elements have existed before as parts of other practices. Practices, therefore, emerge through a reconfiguration of existing practices and their elements. The question arises how to distinguish whether the integration of a new element in a practice is a mere development of that practice or whether this new association creates a new practice. Similarly, it is difficult to determine whether a distinct performance marks the start of a new practice or is merely an innovative performance of the same practice. Schatzki states 'when components of its extant practice organization change piecemeal, or when multiple mutations are accompanied by continuities in other components, a practice lives on. […] By contrast, when changes in organization are vast or wholesale, or a practice's project and tasks are simply no longer carried out, former practices expire' (2002: 244). While this is a plausible concept, it remains for the observer

to determine the threshold between 'piecemeal' and 'wholesale' change (Shove, Pantzar and Watson, 2012: 122).

Similarly, the definite demise of a practice might be difficult to determine. Practices endure between performances. Shove, Pantzar and Watson claim that practices can even survive in 'dormant form' (2012: 154). However, practice theories do not provide theoretical criteria for the distinction of these states nor an empirical method capable of determining whether a practice is between performances, dormant or gone. Especially with hindsight, judgements about the demise of practices can change. The practice of cycling may have appeared to have expired with rising car ownership in the second half of the 20th century. However, its comeback throughout the last decade has now changed the perception of that period of time in that cycling is understood to have been a dormant practice. In conclusion, practice theory lacks clear guidance as to the beginning and the end of practices.

Second, it is unclear at what level of aggregation a practice finds its place. Schatzki defines practice as 'dispersed nexus of doings and sayings, where doings and sayings are actions. He further introduces 'tasks' and 'projects' as actions additionally to doings and sayings (2002: 73). Tasks consist of aggregated doings and sayings, while projects consists of tasks. In result, doings and sayings, tasks and projects are hierarchically organised and all constitute practice. Empirically, it is difficult to determine the level of aggregation of practice. This point can be illustrated through the example of the practice(s) of farming[1]. One could argue that growing wheat is a farming practice and that ploughing the field, sowing seed and harvesting are actions, which constitute growing wheat. Farming would be the term of the aggregate or bundle of several practices. It is also possible to conceptualise practice at a higher level of aggregation and to understand farming as practice. Growing wheat could then be a project, which together with other projects constitutes the practice of farming, and ploughing, sowing and harvesting would be tasks. Finally, it is also possible to conceive of ploughing, sowing and harvesting as practices. Sowing, for example, would then consist of the actions of buying the seed, filling the planter, attaching the planter to the tractor etc. In summary, it is unclear whether the practice finds its place at the level of farming, growing wheat or sowing.

Third, practice theory does not provide clear guidance as to when a performance differs sufficiently to constitute a different practice. Different manifestations of performance can exist in parallel. This is especially common when performances are geographically

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[1] The practice of farming is used by Schatzki as an example of an integrative practice (1996: 99).

separated, but different manifestations of a practice can also exist in the same place. In this case, the question arises as to when a different manifestation actually constitutes a new practice. Barnes (2001) describes how vegetarianism includes several communities of practice which follow different rules. Although according to Schatzki (1996) rules are essential organising structures of a practice, the differences in rules between the communities of vegetarianism do not, according to Barnes, create several practices of vegetarianism (2001: 18). However, in the same work Barnes argues that the difference in the performance and understanding of acupuncture between the traditional east-Asian community of practice and the new Western community of practice, constitute two separate practices of acupuncture (Barnes, 2001: 18-19). It is unclear on which grounds this distinction in interpretation of the differing performances was made.

Fourth, most practice theories introduce shared understanding (or something similar) as a crucial element of practices, but they neglect to determine the required level of shared understanding. When a practice is performed through the same actions, but is not understood in the same way, the question arises as to whether differently understood actions necessarily constitute separate practices. Harvey et al. ask:

> 'For example, a bundle of activities (steering, observing, braking, changing gear etc...) can be labelled as a practice called driving when there is some degree of shared understanding of what driving means. Does the extent to which this understanding is "shared" matter for the definition of the practice? And how is "sharing" to be recognised? Operating a standard, mass produced car entails similar physical movements in the Australian outback as in central Manhattan, but does it make sense to call both "driving" – to disregard the radically different sets of meanings, history, competence and technology entailed in each of these forms?' (2012: 6)

A shared understanding is a crucial element of practice. However, understanding cannot be treated as a dichotomous variable which either exists or does not exist. Rather there are different degrees of shared understanding. Under this assumption, it is indeed a question how to recognise (and measure) shared understanding. Bourdieu states that 'it would be naive to suppose that all practitioners of the same sport (or any other practice) confer the same meaning on their practice or even, strictly speaking, that they are practising the same practice' (1984: 209-211). Bourdieu, therefore, does not make a clear distinction whether a practice has different meanings for each carrier or whether these meanings constitute different practices.

Drawing on the theoretical work on practices, several approaches to the problem of delineating these practice boundaries can be envisioned. First, one can question whether all four boundaries are relevant for the analysis of practice. With regard to the delineation of a practice in a temporal sense, it may not be significant to be able to determine the precise moment of emergence nor the exact moment of demise. Shove, Pantzar and Watson argue: 'Taking the long view, we might therefore conclude that the range of practices in existence today results from an unbroken lineage of past patterns of persistence, transformation and disappearance.' (2012: 64) In this understanding, the emergence of a new practice through a reconfiguration of existing practices and elements may be conceptualised as a fluid process and therefore it may be impossible but also unnecessary to determine precise temporal boundaries.

The second approach to the problem of delineating boundaries is proposed by Harvey et al. (2012) with regard to doing research on practices. The authors recommend to the researcher a delineation of practice boundaries according to the purpose of the research. A practice, then, is a practice because it is a unit of analysis in a piece of research. While this may be useful in research practice, this would mean practices as entities would only exist in relation to the interest of an observer, which may be an excessively relativist concept.

A third approach emerges from the idea that practices are recognisable entities. For Shove, Pantzar and Watson a practice 'exists as a recognizable conjunction of elements, consequently figuring as an *entity* which can be spoken about and more importantly drawn upon as a set of resources when doing [...]' (2012: 7). The idea of people being able to recognise a practice also appears in Schatzki's 'practical understanding', which includes the ability of 'knowing how to identify X-ings' (Schatzki, 2002: 77). Reckwitz describes a practice as 'a pattern which can be filled out' (2002b: 250), thereby accounting for difference in performance, while still preserving the idea of recognisability in the pattern. In this thesis, I will argue that while the beginning and the end of a practice trajectory, here the trajectory of urban transport cycling, may not be determinable, the recognisability of the practice determines the appropriate level of aggregation for the analysis of the practice, and more fundamentally constitutes its existence, even in view of significantly diverse performances and limited shared understanding.

2.1.4   Trajectories of practices

Practices are reproduced through routinised performance. However, this does not explain practice trajectories, i.e. how practices emerge, stabilise, change over time, and disappear. This section will first explore how practice theories conceptualise the stabilisation of practices in an ever-changing context, and then present how practice theories account for changes in practices.

2.1.4.1   Stabilisation of practices

The term stabilisation does not refer to an end result nor to a fixed or unchanging state of a practice, but rather describes an 'emergent and always provisional outcome of successively faithful reproductions of practice [...] when constitutive elements are consistently and persistently integrated through repeatedly similar performances' (Shove, Pantzar and Watson, 2012: 13). In their research on how the freezer became a standard household appliance, Shove and Southerton (2000) argue that the performance of a practice constructs normality which in turn stabilises practice. Instead of interpreting the history of the freezer as a simple process of innovation and diffusion of a new technology, Shove and Southerton show how the freezer was established first as symbol of technological progress, then as an opportunity for economic efficiency in terms of bulk buying, finally as a device to manage time. Simultaneously, an increased share of car ownership, the emergence of superstores, a frozen food culture and the microwave emerged which created strong links between practices of buying, freezing and preparing food. While the account shows the high level of contingency of the development, it also shows that the result was a complex arrangement of strongly linked practices and technologies, which created a normality in which practices stabilised.

In their research on the history of the practice of showering, Hand, Shove and Southerton (2005) add a cultural dimension to the notion of the complex arrangement of linked practices and technologies. The authors show that showering cannot be accounted for by pointing to the technological innovation alone, but must include the cultural history of the body and the socio-temporal demands of daily routine. Thus practices are not only reproduced and stabilised through performance, but also through the arrangement in which they are embedded, which includes co-existing practices, technologies and cultural histories, which together compose the conventions of daily practice (see also Southerton, Warde and Hand, 2004).

Finally, in her work on thermal comfort, Shove (2003) shows that scientific evidence and externally set technical standards can contribute to the normalisation of practices. By tracing the definition of the ideal (and ideally consistent) indoor environment in terms of quantitative values of temperature, humidity and ventilation, Shove shows how scientific work and the setting of technical standards contributed significantly to the success of air-conditioning devices. In this case, comfort was thus constructed as a marketable concept, and the man-made indoor environment was normalised (ibid.: 30). Standardisation based on scientific evidence contributed to the normalisation and stabilisation of the practice of keeping an ideal indoor environment.

Repeated performance in an arrangement of co-existing practices, technologies, cultural histories and standards thus creates a normality in which practices stabilise. The concept of stabilisation will be useful to analyse already stabilised practices, for example driving, and the arrangements which hold them in place, as well as to explore the effects of interventions aimed at the normalisation of a new practice. While the arrangement of co-existing practices and technologies produces stability, it is also dynamic and allows for practice change to which we will turn in the next section.

2.1.4.2 Practice change

While the previous section focused on the stabilisation of practices, I will now turn to the question as to how practices change. In this section, I will present three explanations of practice change: first, through change in the individual elements of a practice; second, through the individual practical intelligibility produced by the participation in a unique combination of practices; and third, through change in co-existing practices or other elements in the complex arrangement of co-existing practices and technologies in which practices are embedded.

Shove, Pantzar and Watson argue that each performance slightly changes the elements, i.e. materials, meanings and competence, which constitute the practice (2012: 122). As we have seen above, technological innovations can provide an impetus for change, although this is seldomly the whole story. Wenger argues every performance of a practice is a renewed negotiation of meaning (1998: 52), which in turn transforms the practice. Finally, Barnes argues that practices change because learning occurs in every performance (2001: 25). The learning forms the practical intelligibility of an individual (Schatzki, 2002: 81) and has a transformative effect on the carrier as well as the practice (Shove, Pantzar and

Watson: 73). Therefore, practices are constantly in a process of 'formation, re-formation and de-formation' through performance (ibid.: 44).

Explaining change also requires a shift in focus to the individual performance (see Watson, 2012: 491). Shove, Pantzar and Watson state that 'not all enactments of practice are consistent or faithful and […] each performance is […] in some respect unique' (2012: 122). Practice theories conceptualise individuals as carriers or hosts of practices. Practices recruit or lose carriers (see ibid.: 63-79). However, carriers are not passive, they are not all 'faithful servants' (ibid.: 126), but actively perform and individually shape the performance. In view of the social nature of practices as well as their organising structures, this individual flexibility for innovation in the performance requires explanation. Schatzki's concept of practical intelligibility as well as Wenger's notion of multimembership can contribute to an understanding of how innovation and experimentation can occur.

According to Schatzki (2002), human activity is governed by practical intelligibility, which means what makes sense to a person to do in a particular context. Practical intelligibility is an individualist phenomenon. Features of the individual, such as a person's ends, her projects and tasks as well as affectivity, mainly determine practical intelligibility (Schatzki, 2002: 75). Practices can mould these features, amongst other things through the normativity included in the teleoaffective structure of a practice, i.e. its 'oughtness' or acceptability (Schatzki, 2002: 80), and thereby influence what makes sense to a person to do. Innovative actions can, therefore, emerge from different individual practical intelligibilities.

The reason for the differences in practical intelligibilities between people is the unique combination of practices in which a person participates. People participate in a multitude of practices; they are at the 'crossing point' (Reckwitz, 2002b: 256) or 'intersection of practices' (Warde, 2005: 143) and thereby members of many 'communities of practice' (Wenger, 1998: 158-161), a concept to which I will return in the next section. Each membership contributes to the production of the individual identity (ibid.: 158). Wenger argues that individual identity is the product of a work of reconciliation of the experience of multimembership, and in particular of the competing demands of different practices (ibid.: 159-160). Identity can be seen as a nexus of multiple memberships which is unique to every individual. This individual identity, shaped by the participation in a unique combination of practices in a unique arrangement, can produce innovative interpretations and styles in

performance and adaptations, improvisations and experiments in practice (see also Warde, 2005: 141).

Finally, practices change with changes in co-existing practices (Watson, 2012). Warde states that 'practices are not hermetically sealed off from other adjacent and parallel practices, from which lessons are learned, innovations borrowed, procedures copied' (2005: 141). The complex arrangements of linked practices, technologies and cultural histories which contribute to the stabilisation of an embedded practice can also contribute to change when one of the elements in the arrangement changes.

2.1.5   Communities of practice

In the previous section, I introduced Wenger's (1998) notion of the community of practice. A community of practice consists of all carriers of a particular practice. The practice and its community are mutually constitutive. Wenger describes three characteristics of practice which produce the coherence of the community of practice: mutual engagement, a joint enterprise and a shared repertoire (1998: 72-85), which I will review in turn below.

As discussed above, practices are social phenomena which are reproduced through performance. Participating in a practice entails co-existence with other participants. For Wenger, practices exist 'because people are engaged in actions whose meanings they negotiate with one another' (1998: 73). These negotiations are the 'mutual engagement' which constitutes a community of practice. In turn, the community of practice sustains the practice: 'It is only through the interaction of a membership characterized by mutual intelligibility and mutual susceptibility that something identifiable as shared practice can be sustained' (Barnes, 2001: 26). It is noteworthy that a community of practice is not necessarily characterised by agreement and harmony, as the term 'community' might suggest, but can be the locus of disagreements, tensions and conflicts (Wenger, 1998: 77).

The result of the mutual engagement is the joint enterprise of a community of practice, which reflects the full complexity of the mutual engagement and is a response to the context in which the practice and its community are embedded (Wenger, 1998: 77). According to Wenger, the joint enterprise 'is not just a stated goal, but creates among participants relations of mutual accountability that become an integral part of the practice' (ibid.: 78). Similar to mutual engagement, joint enterprise does not require or produce agreement or uniformity of the community of practice. In fact, coordinating different individual situational responses is part of the collective enterprise (ibid.: 78-79).

This characteristic of practice appears to have a similar function as Schatzki's (2002) organising structures of practice. With the notion of teleoaffective structures, Schatzki introduces a normative organisation of practice which defines what should be done ('oughtness') or what may be done ('acceptability') (2002: 80), which is similar to the accountability established through the negotiation of the joint enterprise. Additionally, Wenger states that accountability can be reified in the form of rules, policies, standards etc. (1998: 81), which again coincides with Schatzki's rules (2002: 79).

Finally, the third characteristic of practice, which produces the coherence of the community, is the shared repertoire of a community, which is established in the course of pursuing the joint enterprise. The shared repertoire can consist of a broad variety of elements, such as 'routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions, or concepts […] It includes the discourse by which members create meaningful statements about the world, as well as the styles by which they express their forms of membership and their identities as members' (Wenger, 1998: 83). Although the elements of the shared repertoire act as collective points of reference for the community, they remain inherently ambiguous and therefore allow further negotiation of the meaning of the practice (ibid.).

Community of practice is the locus of recruitment, social learning and practitioner careers (see Wenger, 1998: 86-102; Shove, Pantzar and Watson, 2012: 69-73). Lave and Wenger (1991) describe practitioner careers as movement from the periphery of the practice community to the centre. New members are recruited to the practice and learn by engaging in the practice and appropriating the joint enterprise and shared repertoire. Barnes explains that 'a member […] has to be sensitive to what other practitioners are doing' (2001: 26). This means that the practitioner must be 'both cognizant and disposed to move in the direction of the practice in order to be a practitioner herself' (ibid.). In the course of the career, a practitioner becomes not only more skilful, but also learns what ought to be done and what is acceptable and becomes accountable to the other members of the community of practice. However, not only new members learn. Rather, learning is a continuous process which occurs in every performance (Wenger, 1998: 95). Therefore, old and new members reproduce the practice as well as the joint enterprise and shared repertoire of the community through performing the practice and learning, and old and new members can also be the source of practice innovation and change (see Shove, Pantzar and Watson, 2012: 71-72).

2.2 Conceptualisations of interventions in human activity

It has long been established that current lifestyles and consumption patterns are unsustainable (Wackernagel and Rees, 1996). In view of climate change and diminishing non-renewable resources considerable effort has been made to intervene in individual consumption. This part of the chapter will review three different fields of literature which have addressed interventions in human activity: behavioural approaches, practice theories and Science and Technology Studies.

I will first focus on behavioural approaches. Policy interventions in individual consumption have mainly been based on micro-approaches which focus on the individual and assume that behaviour is a result of rational choice, based on attitudes and personal knowledge (see Shove, 2010 for a critique). I will argue that linear causal models of interventions in which external factors influence behaviours are simplistic and that the focus on an independent individual and choice neglects the embeddedness of human activity in social and material contexts.

The subsequent section will turn to theories of practice which recognise the embeddedness of human activity and acknowledge that interventions can only take effect as part of the complex arrangement of co-existing practices and technologies. I will review four policy approaches proposed by Shove, Pantzar and Watson (2012), which address the elements of practice, the relations between practices, the careers of carriers and trajectories of practices and finally the social networks through which practices circulate. I will argue that while these approaches introduce a new and useful way of thinking about policy interventions, there are three areas that require further conceptualisation: the relationship between material and practices, the development of the interventions themselves in the context of the local arrangement of co-existing practices and technologies, and the conceptualisation of practice interventions at a systems level.

Therefore, the subsequent section will present three concepts of the Science and Technology Studies literature to complement the practice-based approaches: scripts, programmes and anti-programmes from actor-network-theory will add a clearer conceptualisation of the relationship between practices and materiality, the social-constructivist approach to technology will shed light on the development of interventions, and finally socio-technical systems as a version of systems theory will contribute to broaden the focus of the practice approach to the systems level.

In the fourth section, I will present an approach which integrates the concept of socio-technical system with theories of practice in that it suggests recasting socio-technical systems as systems of practice (Watson, 2012). This new way of thinking about socio-technical systems opens up the possibility to analyse large-scale transitions with theories of practice, while still remaining focused on the local embeddedness of everyday practices and preserving the basis of a flat ontology.

2.2.1 Behavioural approaches

Human activity has been at the core of research conducted in various fields of the social sciences and beyond (see Kollmus and Agyeman, 2002). Recently a renewed interest in the subject has emerged in the context of climate change and the pressure to change patterns of consumption. The dominant paradigm in this research originates in environmental psychology and behavioural economics, which focus on individual behaviour and choice.

The simplest model of human behaviour originates in the early US linear progression models. These models use a micro approach focused on a rational individual. The core idea is that behaviour is the outcome of individual rational choice, which is shaped by attitudes in a linear causal relationship. The model has been elaborated and several factors have been added to it in order to improve its predictive capacity.

The most influential factor which has been added to the linear causal model is knowledge which influences attitudes. The assumption that knowledge influences attitudes has led to theories of 'information deficit' (Burgess, Harrison and Filius, 1998). This general linear causal model has produced decades of research into the relationship of knowledge, attitudes and behaviour and until today it represents the basis of most public policy approaches in the UK and abroad (Shove, 2010), which often result in political campaigns targeted at changing individual attitudes and reducing information deficits.

However, Blake (1999) introduces the term 'value-action-gap' after finding that pro-environmental attitudes do not necessarily result in environmentally friendly behaviour. With regard to the role of knowledge and information in changing behaviour, Burgess, Harrison and Filius find that whether environmental communications are received and effective in producing change in people's attitudes and values depends on many factors (1998: 1446-1447). The authors conclude: 'Hopes are fading of achieving dramatic changes in individual lifestyles simply on the basis of 'more' or 'better' information' (1998: 1447).

The information-intensive nature of most programmes which aim at promoting sustainable behaviour is further criticised by McKenzie-Mohr (2000), who introduces 'community-based social marketing' as an alternative to information-based campaigns. Community-based marketing first identifies barriers to certain behaviour, then selects a particular behaviour to promote, designs a programme to overcome the identified barriers, which is then piloted, implemented and evaluated (McKenzie-Mohr, 2000). However, this approach wrongly assumes that barriers are fixed and external, rather than part of a dynamic socio-technical system (see sections 2.2.3.3 and 2.2.4).

The strong focus on attitudes and the assumption of rationality in much of this research have been criticised as limited concept of human behaviour, which excludes structural factors, such as social dilemma situations, or external factors, such as available infrastructure. However, this critique is not quite accurate. Based on research carried out in the 1970s and 80s, Stern and Oskamp propose a causal model of resource use which includes structural and institutional factors (1987: 1063). Based on this work, Guagnano, Stern and Dietz (1995) develop the 'A-B-C Model' of behaviour in which behaviours (B) are associated with attitudes (A) and external conditions (C). External conditions include physical, financial, legal or social sources of support or opposition to certain behaviour. Following this model, it would be possible to compensate A with C and vice versa, i.e. it would be possible to compensate a lack of environmental awareness with especially good infrastructure design. This is what the authors then show empirically with an example of curb side pickup of recycled materials which made recycling so 'convenient' that the factor of attitudes lost its predictive value.

Barr (2007) builds on this model and includes a variety of attitudinal, situational and psychological variables. He also takes into account previous experience as an independent variable and, therefore, includes a temporal dimension and thereby an idea of learning and routinisation. However, apart from the problem of quantifying, measuring, weighting, and choosing appropriate mathematical operations, these models overlook the interaction between situational variables such as infrastructure and behaviour and the recursive and iterative development of this relationship over time.

In the 'Theory of Planned Behavior' (Ajzen, 1988; 1991) attitudes, subjective norms and perceived behavioural control shape behavioural intentions and finally actions. Subjective norms are determined by normative beliefs, which 'are concerned with the likelihood that important referent individuals or groups approve or disapprove of performing a given

behavior' (Ajzen, 1991: 195). Social norms research has recently experienced a revival, especially with regard to the challenge of reducing household energy consumption (Schultz et al., 2007; Allcott, 2011). Several experiments have been conducted as to the effect of informing consumers on their level of consumption compared to the average level of consumption in the neighbourhood.

While these experiments have shown that social norms can effectively contribute to a reduction in energy use (Allcott, 2011), they have also shown that there is a possibility of a boomerang effect, i.e. that the normative information backfires and produces the opposite of the intended effect (Cialdini, 2003; Schultz et al., 2007). Messages have to be carefully designed, distinguishing between descriptive norms (what other people do) and injunctive norms (what other people approve) in order to keep people who already act in the desired way, i.e. people with low energy consumption, from adapting to the less desirable average (Cialdini, 2003; Schultz et al., 2007). Apart from the risk of the boomerang effect, the approach appears limited in its scope as it ignores the context of people's actions. In the area of household energy consumption for example it is relevant where and how people live: whether they own or rent, whether they can make home improvements etc.

The idea of the (material) context of decisions is taken up in the concept of nudge developed by Thaler and Sunstein (2009). In this concept a 'choice architect' (ibid.: 3) designs the context of choices in such a way so as to help people make better decisions (as judged by themselves). This can be done through the positioning of healthy food in a prominent location in the cafeteria or through the setting of particular default options. This approach recognises that humans predictably err through psychological biases (ibid.: 8, 19-41). The choice architect therefore approximates the decisions that people would make 'if they had paid full attention and possessed complete information, unlimited cognitive abilities, and complete self-control' (ibid.: 6). The authors call this approach 'libertarian paternalism' (ibid.: 5) because it changes the choice architecture to the advantage of the preferred option without actually eliminating the alternative options. 'A nudge […]is any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives' (ibid.: 6).

The nudge approach has been extremely popular with policy-makers and has inspired government strategies in the US, the UK and France (Vallgårda, 2012). However, the approach is also harshly criticised, mainly based on libertarian principles. Concerns have been expressed as to the way in which the nudge approach takes advantage in a calculated

way of people's cognitive biases (Hausman and Welch, 2010), the concealed nature of nudges (Vallgårda, 2012), the lack of guidance as to how to determine what good choices are as judged by the people (Sugden, 2009), the assumption that people value 'good choices' more than their freedom (including their freedom to make mistakes) (Vallgårda, 2012), and the risk of abuse (Hausman and Welch, 2010). Furthermore, it is shown that nudges do not necessarily respond to the problem of cognitive biases presented by Thaler and Sunstein (Desai, 2011).

Both the social norms as well as the nudge approaches recognise the limited rationality of the individual as well as the embeddedness of behaviour in social and material contexts. Nevertheless, the individual remains the focus. Although the social norms approach is based on socially shared understanding and the nudge approach focuses on choice architecture and thereby recognises that individual behaviour is influenced by arrangements outside her own rationality, behavioural change is still produced by individuals who react to external pressure.

Shove (2010) disagrees with the focus on individual behaviour and choice. She argues that the focus on the individual is politically attractive as governments thereby reject their own responsibility for change and allocate the blame to the individual if the interventions do not produce the desired effect. Political interventions should not be focused on individuals, but rather on social practices to which we will turn in the next section.

2.2.2 Practice approaches

While previously research into practices mostly focused on understanding the historical trajectory of a particular practice, recently the research focus has shifted to the challenge of intervening in the dynamics of social practices. The detailed historical analyses of practices such as freezing food (Shove and Southerton, 2000), showering (Hand, Shove and Southerton, 2005), Nordic walking (Shove and Pantzar, 2005) etc. have contributed to a better understanding of the trajectories of practices, their respective technologies, associated images and shared knowledge. Fuelled by the challenge of climate change mitigation and the discussions around current unsustainable resource consumption, practices research is now faced with the challenge to explore potential ways to intervene in the trajectory of practices (Harvey et al., 2012). The questions whether it is possible to facilitate the emergence of sustainable practices and to support the recruitment of more

carriers to said practices, while eroding or limiting the expansion of existing unsustainable practices has come to the forefront of practice research.

Contrary to proponents of behavioural theories, practice theorists generally show a certain reluctance to suggest policy measures. Practice theory disagrees with the cause-and-effect type explanations of behavioural models, which are based on the notion of linear causality between external conducive factors or barriers on the one hand and behaviour on the other. Practices are not driven by external factors. Practices are conceptualised as emerging processes which are constantly in transition. Interventions, therefore, do not act as external factor, but rather 'have effect (some intended, some not) within and as part of the ongoing dynamics of practice' (Shove, Pantzar and Watson, 2012: 145). Furthermore, practices do not exist in isolation, but form complexes of practices and material arrangements, which share elements and actions. Targeting one action or one element of a social practice will in turn have an impact on several other practices. Finally, practices are embedded in a local and historical context, which limits the transferability of public policies. Practice theorists are, therefore, doubtful with regard to generalised policy recommendations targeted at bringing about a pre-determined outcome.

While practice theorists generally underline the complexity of intervening in the evolution of social practices, they do not reject the idea of interventions completely. Shove argues in favour of a more holistic approach, which acknowledges that practices are 'socially, institutionally, infrastructurally configured' (2010: 1281). Based on this premise, Shove asks: 'What is to stop social scientists and policy makers paying close attention to the making and the erosion of 'envirogenic' environments, these being ones that favour the reproduction of variously sustainable ways of life?' (ibid.: 1282). The thought remains vague, however, and no advice is provided as to the practical implementation. This shortcoming is addressed in more recent work by Shove, Pantzar and Watson (2012). Based on the premise that policy-making is a complex, embedded and iterative process, involving continual adjustments and that, therefore, a modest approach is called for, the authors develop four potential policy approaches. A critical review of these suggested approaches will be presented in the remaining paragraphs of this section.

The first approach to policy-making 'configuring elements of practice' (Shove, Pantzar and Watson, 2012: 147-151) aims to change elements, i.e. the material element, the competence and/or the meaning of a practice. This approach seems straightforward at first sight, but several doubts arise in the more detailed analysis. First, it produces questions as

to which elements should be targeted. Shove, Pantzar and Watson themselves pose the question: 'Would candidates include electricity, meat, concepts of Westernization, the valuing of convenience, or competence in long-distance travel?' (2012: 147). In general, it can be questioned whether elements as such can actually be evaluated on their own terms. Intelligibility, i.e. what something is understood to be, is expressed in and reproduced through practices (Schatzki, 1996: 111), not through elements of practices. Therefore, it seems more coherent to evaluate practices rather than their elements.

Furthermore, the question arises who would determine the criteria for the determination of those elements which should be configured, on what authority and on whose behalf (incidentally, a criticism Shove and Walker (2007) express vis-à-vis transition management). Also, seeing that policy-making is understood as an iterative process, it remains to be determined how and when/how often the criteria should be reviewed. Assuming that sustainability is the overall goal, it is still not always clear which practices, let alone which elements, are sustainable or unsustainable as the different dimensions of sustainability (social equity, economic growth and environmental protection) do not always coincide. In conclusion, just as Shove and Walker state: 'there is a politics to transition management […] which cannot be hidden beneath the temporary illusion of 'postpolitical' common interest claims of sustainability' (2007: 766), I argue that there is just as much politics to the configuration of elements with all the implied difficulties of such political decisions.

As to the implementation, the capacity of governments is certainly limited with regard to limiting the circulation of materials, competence and meanings (Shove, Pantzar and Watson, 2012: 148). With modern forms of communication and social media, knowledge is more readily available than ever and images and videos can spread and rapidly change meanings of practices on a global scale. Additionally, an intervention targeted at an element of a practice might produce unintended effects as elements can be part of several practices simultaneously. Even competing practices often share elements, especially material infrastructure. Therefore, improvements of that infrastructure may benefit a competing practice as well as or even more than the originally targeted practice.

Finally, this approach reminds us of the policy approaches based on behavioural models aimed at eliminating barriers or producing conducive factors for certain behaviours (see Spurling et al., 2013: 6). Although the presentation of this policy approach, especially the language used, shifts the focus and the responsibility from the individual and her choice to the practice, the implementation of this policy approach seems to be based on the idea of

an external intervention rather than an intervention embedded in the complex arrangement of practices. For example, the difference between an intervention targeted at providing a conducive factor such as material infrastructure for a socially desirable behaviour and an intervention targeted at the material element of a social practice seems minimal. Likewise, an attempt to change the attitudes of individuals of a group or an attempt to change the shared meaning of a practice may look quite similar in their implementation. In conclusion, although the presentation of this policy approach shifts the focus and responsibility from the individual to the practice, it is limited, may produce considerable side-effects and seems rather disappointing in terms of innovative policy-making based on theories of practice.

The second approach to policy-making focuses on the relations between practices (Shove, Pantzar and Watson, 2012: 152-156). As we have seen, practices stabilise in complex, dynamic and durable arrangements of co-existing practices and technologies. While most policy approaches focus on the practice which is to be facilitated, this approach shifts the focus to the question of how to dismantle the current arrangement which holds an undesirable practice in place. Practices can co-exist, compete or form co-dependent relationships with one another, and the type of relationship between practices can change over time. Practices compete for finite resources in the form of space, participants and their time, and materials. The question whether one practice can emerge depends to some extent on whether it can break through existing systems of practice. As Shove, Pantzar and Watson put it as in the case of cycling: 'Whether cycling is characterized as slow, dangerous or effortful is not just a matter of personal opinion, but is instead related to the systemic configuration of this practice and of others in terms of which it is defined' (2012: 152). Therefore, interventions take effect within existing dynamic arrangements of practices and need to take into account established practices, i.e. practices which are considered normal at that time and the arrangements that hold them in place. This thought coincides with the notions of obduracy of material infrastructure and path-dependency of socio-technical systems which will be reviewed under section 2.2.3.

According to Shove, Pantzar and Watson (2012), when existing practice arrangements are eroded and a new practice is systematically prioritised, the dynamics of practices can produce positive feedback loops. This thought has been developed in more detail in Urry's (2004) conceptualisation of complex systems. Although a system achieves a certain stability in equilibrium which makes it durable, change is possible and occurs in non-linear ways.

Based on Gladwell (2000), Urry refers to tipping points which 'involve three notions: that events and phenomena are contagious, that little causes can have big effects, and that changes can happen not in a gradual linear way but dramatically at a moment when the system switches' (2004: 33). Small changes can therefore have great effect, while big interventions may also fail. This makes policy interventions unpredictable, but also increases the significance of small-scale interventions.

The third approach to policy-making shifts the focus to the carriers of practice (Shove, Pantzar and Watson, 2012: 156-160). On a macro level, 'governments have a hand in reproducing versions of normal and acceptable ways of life, and in configuring 'projects' that require specific patterns' (ibid.: 157-8) of action. Individual trajectories are structured around these collective projects and new practices may link to other more established practices and benefit from their growth and recruitment.

However, policy measures that target the recruitment of more carriers to a certain practice, meet potential candidates at different stages in their lives with different dispositions shaped by past performances amongst other things. Returning to Bourdieu's dispositions (habitus), it might be more fruitful to change the perspective. Instead of thinking to adapt individual behaviour, we might have to think in terms of adapting practice to individual dispositions. Crucially, the characteristic of the practice which makes it desirable, cannot be changed, but that might still leave some flexible elements.

The fourth approach to policy-making 'configuring connections' (Shove, Pantzar and Watson, 2012: 160-162) shifts the focus to the network of people involved in transitions. Shove, Pantzar and Watson argue that 'policy makers have an obvious role in bringing existing actors together […] as part of a deliberate strategy to reconfigure the character and the distribution of the elements of which more sustainable practices *could be* made' (ibid.: 161, emphasis in the original). Policy-making here is the process of building networks in which social learning can take place.

These approaches to policy interventions introduce a new and useful way of thinking: the first approach can be used to analyse the provision of cycling infrastructure; the second approach will contribute to conceptualising the relationship between the competing practices of driving and cycling; the third approach allows to think about the image of cycling and how it fits with ways of life and aspirations of carriers; and the fourth approach is relevant in view of the multitude of involved actors in the planning and provision of

infrastructure. Nevertheless, in view of the proposed research there are three areas that need to be explored further: the relationship between material and practices, the development of interventions in practices, and the conceptualisation of practice interventions at a systems level.

First, although practice-based approaches to interventions attribute a significant role to the infrastructural and material organisation of practices (Evans, McMeekin and Southerton, 2012: 119), the nature of the relationship between practices, material artefacts or infrastructures remains contentious and underexplored. While some theories see material artefacts as part of the practice (Reckwitz, 2002b; Shove, Pantzar and Watson, 2012; etc.), according to Schatzki (2011) material arrangements are inseparable but still external to practice. Furthermore, practice theories do not actually conceptualise how material elements shape practices.

Second, the policy approaches presented above mainly focus on how interventions could take effect, but they neglect how interventions are shaped. Practices are embedded in complex arrangements of co-existing practices and technologies in which they stabilise (see section 2.1.4.1). Shove, Pantzar and Watson (2012) argue that practice interventions cannot be understood as external factors, but they take effect within and as part of the current arrangement of practices and technologies (see above). Here the question arises how interventions themselves are developed, planned and designed *within and as part of* this same arrangement, and how interventions which challenge a dominant arrangement can be developed within that dominant arrangement.

Third, practice theories have been criticised to exclusively focus on the local and to lack a systemic perspective (Geels, 2010). As we have seen, practices are conceptualised as part of complex arrangements of several co-existing practices and technologies (see section 2.1.4.1). However, the systemic perspective deserves further attention. These three areas are going to be explored through approaches from Science and Technology Studies in the next section.

2.2.3 Science and Technology Studies approaches

This part of the chapter will turn to concepts developed in Science and Technology Studies to complement our understanding of interventions in the dynamics of practices. I venture into this additional field of literature because mobility practices are intricately linked to material infrastructure and can only be analysed in the context of the urban transport

system. This part of the chapter will use Science and Technology Studies in order to conceptualise the gaps identified above, focusing on the relationship between practices and material infrastructure.

The term infrastructure has a range of meanings. The prefix infra can be translated as 'below', 'beneath' or 'under'. Infrastructure is the underlying support structure of a system or an organisation. Attempts to differentiate different kinds of infrastructure have resulted in the addition of adjectives to the term. Green infrastructure refers to the network of natural areas and social infrastructure denotes the network of facilities which support social interaction. The terms 'physical', 'hard' or 'material' infrastructure are used to underline the material nature of the structure in question.

The term 'material infrastructure' seems to suggest a structure which is separate from the social world. Material infrastructure is commonly seen as static pieces of technology, literally set in stone, planned and built in response to a pre-existing technical problem. A great effort has been made by the Science and Technology Studies literature to create new narratives to show the entanglement of the material and the social, and the politics involved in the development of technology and the provision of infrastructure.

In the first section, I will present some basic concepts of actor-network-theory, namely scripts/programmes and anti-programmes, which direct our attention to the way in which material artefacts shape behaviour (Akrich, 1992; Latour, 1991). These concepts can be adapted to the analysis of material infrastructure and how it shapes practices, which will be useful to analyse how material artefacts and infrastructure shape cycling, especially specific cycleway designs. In the second section, I will review accounts of the development of technology, which specifically acknowledge the politics and contingencies involved in the development (Pinch and Bijker, 1984; Bijker, 1992; 1995; Pinch, 2010). These accounts can be transferred to the planning and design of infrastructure and will be useful for the analysis of the provision of cycleways. In the third section, I will review the literature on socio-technical systems (Hughes, 1986; Geels, 2004), the concepts of momentum (Hughes, 1983) and obduracy (Hommels, 2005) as well as the transition management model based on the 'Multi-Level Perspective' (Rip and Kemp, 1998; Kemp and Rotmans, 2005; Kemp, Loorbach and Rotmans, 2007). While the transition management model has been heavily criticised (Shove and Walker, 2007), the concept of socio-technical systems is a useful lens through which to gain a better understanding of the challenges of a systemic transition from automobility to 'velomobility' (see Watson, 2013).

2.2.3.1 Scripts, programmes and anti-programmes

A fundamental claim of actor-network-theory is that material artefacts have agency (Latour, 2005: 63-86). Artefacts enter into association with humans and non-humans to form chains of associations which have the power to modify states of affairs. Furthermore, things are to a certain extent able to impose a particular behaviour onto humans. Akrich calls this mechanism 'prescription' (1992: 211). Examples of prescriptions are manifold: the shape of a chair imposes an upright posture or a speed bump forces us to slow down. A closer look at these nonhuman actants reveals that each carries inscribed an 'imperative statement' (Latour, 1991: 104, 106) , such as "please, slow down" or "sit upright", and each defines a framework of action, which Akrich names 'script' (1992: 208) because of its closeness to a film script, and Latour terms 'program of actions' (1991: 107).

The programme of actions includes a preconceived idea of the anticipated user of the artefact to whom certain characteristics, qualities and behaviours are prescribed. However, there is a gap between the *inscribed user* and the *user-in-the-flesh*, and not all behaviours can be anticipated. Reactions of users that are in conflict with the anticipated behaviour are called 'antiprograms' (Latour, 1991: 105). For example a speed bump may divert traffic to a parallel road or the shape of the chair may be changed by an additional cushion. These reactions then evoke re-re-actions and a cycle of action and reaction is established until the practice stabilises. Artefacts can also *allow* or *afford* certain behaviours (Akrich and Latour, 1992: 261). However, again there is no certainty about the behavioural response to the affordances of an artefact. Latour concludes that the 'fate of a statement is in the hands of others' (1991: 105-106) and it depends on the users-in-the-flesh whether prescriptions will be obeyed or circumvented and in which way the programme of action will be transformed.

It is important to note that Schatzki disagrees with Latour on the agency of material artefacts (Schatzki, 2002: 71, 198-199) and limits agency to people. Schatzki's reason for the distinction is that non-human entities lack intentionality. Latour rejects the common notion of subject-object dualism. He anticipates the criticism that things cannot act with intention: 'If action is limited a priori to what 'intentional', 'meaningful' humans do, it is hard to see how a hammer, a basket, a door closer [...] could act. They might exist in the domain of the 'material' 'causal' relations, but not in the 'reflexive' 'symbolic' domain of social relations' (2005: 71). Latour does not understand intentionality as critical and argues that an actant is '*any thing* that does modify a state of affairs by making a difference'

(2005: 71, emphasis in the original) and justifies the integration of things as actants by pointing to simple tasks, such as hitting a nail or boiling water, which would be fundamentally different without a hammer or a kettle. Reckwitz agrees: 'When particular 'things' are necessary elements of certain practices, then, contrary to a classical sociological argument, subject-subject relations cannot claim any priority over subject-object relations, as far as the production and reproductions of social order(liness) is concerned' (2002b: 253).

I have found the above presented concepts of actor-network-theory a useful lens through which to analyse the relation between the bicycle, the infrastructure and the cyclist. As we will see in the chapters 5 and 6, cycling infrastructure is designed to script the practice of cycling, and the cyclists' refusal to obey the prescription causes considerable conflicts between motorists and cyclists.

2.2.3.2   The politics of technological development

While technological development is often perceived as a purely technical process, Science and Technology Studies have made an effort to show that 'the so-called social and political background are embodied in the technology' (Hughes, 1986: 290). Authors in this field have traced the development of technology and made visible the social and political struggles which marked these developments (Schwartz Cowan, 1985; Law and Callon, 1988; 1992) as well as followed the on-going transformations of technology during its diffusion and use (Bijker, 1992; Shove and Southerton, 2000).

The first concept relevant for this work is the concept of 'relevant social groups' (Pinch and Bijker, 1984). Most accounts of technological development follow a linear stage model, including design, production, sales, distribution and use (see Bijker, 1992), in which the successful end product is portrayed as the only possible and most efficient outcome. On the contrary, the Social Construction of Technology (SCOT) approach argues that this linear model inhibits the understanding of technological development and that rather a multi-directional model of technological development should be adopted in which the end result is one of many possible outcomes and the product of negotiations between 'relevant social groups' (Pinch and Bijker, 1984; Bijker, 1992). Social groups can be institutions, companies as well as organised or unorganised groups of individuals (Pinch and Bijker, 1984: 414), and the members of these groups share the same meaning of the material artefact in question.

The SCOT approach further introduces the concepts of technological frames and interpretative flexibility. A technological frame 'structures the interactions among the members of a relevant social group […] and comprises all elements that influence the interaction within relevant social groups and lead to the attribution of meanings to technical artifacts' (Bijker, 1995: 123). Specifically, a technological frame includes the theory, knowledge, practices, values and material networks that social groups develop with regard to a certain technology (Bijker, 1992).

While a social group is homogeneous in terms of the meaning which its members associate with the artefact, the technology is interpreted differently by different social groups. Pinch and Bijker (1984) call this 'interpretative flexibility'. Pinch and Bijker argue that this flexibility does not only refer to how people think of artefacts, but also how they are designed and that there is not one optimal outcome, but multiple possible ways (1984: 421).

Following the SCOT approach, each relevant social group has specific problems with regard to the technology, and around each problem there are several possible solutions (Pinch and Bijker, 1984: 415). This perspective then allows the identification of conflicts between solutions: conflicting technical requirements, conflicting solutions to the same problem, and even moral conflicts with regard to the use of the technology (ibid.: 416). The developmental process is therefore a continuous process of negotiation between relevant social groups. The resolution of conflicts then finally leads to stabilisation of a technology after which it is taken for granted and becomes invisible (Pinch, 2010).

In conclusion, the production of infrastructure does not follow a technical rationality, but is the result of 'framed' negotiations between social groups and contingencies. In chapter 6, I will use this approach to identify the relevant social groups, explore the interpretative flexibility as to the cycleway, and trace the problems, current frames, and problem-solving strategies for the planning and design of cycleways.

2.2.3.3 Socio-technical systems and transitions

The field of Science and Technology Studies also conceptualises the recursive relationship between the technical and the social at a more aggregate level of socio-technical systems. Similarly to the approaches in the previous section, Hughes (1986) criticises histories of technological developments in which technology seems to display an 'inherent logic'. Simultaneously, Hughes criticises the contextual approach which uses high-level

abstractions such as 'the social' or 'the political' without clarifying the nature nor the relationship between context and technological development, a critique which is later elaborated by Latour (2005). As an alternative perspective, Hughes (1986) introduces the image of a 'seamless web' in order to describe the entanglement of technological development, scientific discovery and social organisations. This idea has been taken up and developed by numerous scholars. In an attempt at a comprehensive approach, Geels defines that socio-technical systems encompass the production, diffusion and use of a certain technology and they consist of 'artefacts, knowledge, capital, labour, cultural meaning, etc.' (2004: 900). Geels further adds that the key purpose of a socio-technical system is the fulfilment of societal functions (ibid.).

According to Rip and Kemp '[t]he idea of the seamless web also implies that the evolution of technology and the evolution of society cannot be separated, and should be thought of in terms of coevolution' (1998: 337). While the concept of co-evolution originally stems from biology, Latour introduces the concept of co-evolution of the technical and the social: 'Contrary to the claims of those who want to hold either the state of technology or that of society constant, it is possible to consider a path of an innovation in which *all the actors* co-evolve' (Latour, 1991: 117, emphasis in the original). The concept is well suited to the thinking of Science and Technology Studies, and thus it is not surprising that it has been adopted widely, with different subjects in the focus. Ways of life co-evolve with technologies (Guy and Shove, 2000: 6), technology design co-evolves with use (Rohracher and Ornetzeder, 2002: 74) and, more broadly, we find 'co-evolution of social and technical systems' (Guy and Shove, 2000: 131), and co-evolution of social and technical change (Brand, 2005).

According to Hughes (1983) socio-technical systems have momentum. Hughes analyses the 'electrification in Western society' and argues that the 'systematic interaction of men, ideas, and institutions, both technical and nontechnical, led to the development of a supersystem—a sociotechnical one—with mass movement and momentum' (1983: 140). The momentum was created first by investments in resources, labour and manufacturing plants, later by educational and research institutions, and throughout the development the experience and competence of engineers, skilled labourers and managers fed back into the system (ibid.).

The momentum of socio-technical systems does not only drive technological development, but also produces a resistance to change, which Hommels (2005) calls 'obduracy' in her

analysis of large-scale urban technology. The resistance to change is partly produced through the 'embeddedness' (see Hommels, 2005: 334-338 for a detailed review of this concept) of the technology in the socio-technical system. As Geels puts it: 'People adapt their lifestyles to artifacts, new infrastructures are created, industrial supply chains emerge, making it part of the economic system dependent on the artifact' (2004: 911). In this way, socio-technical systems get 'locked in' through past events and the 'seamless web'. Urry illustrates this: 'The effects of the petroleum car over a century after its chance establishment show how difficult it is to reverse locked-in processes, as billions of agents co-evolve and adapt to form a system of interdependent agents and relations—a complex assemblage or system that 'constitutes' the 'steel-and-petroleum' car' (2008: 344). The associations within the system mean that it becomes increasingly difficult to isolate and change one element, such as a particular artefact and, therefore, constitute a resistance to change.

Furthermore, frames as 'fixed ways of thinking and interacting' (Hommels, 2005: 331) also establish resistance to change. Hommels argues: 'As a result, it becomes difficult to bring about changes that fall outside the scope of this particular way of thinking.' (ibid.) One origin of this concept is Bijker's (1995) 'technological frame' (see previous section). This category of obduracy 'highlights the struggle for dominance among groups of actors with diverging views and opinions' (Hommels, 2005: 331).

As we have seen, socio-technical systems are complex systems, which consist of multiple intertwined elements, which have certain momentum and exhibit resistance to change. Adding to the complexity is the non-linearity of system development. Small changes can have great effects, whereas big interventions can have barely any effect (see Urry, 2004: 32). Therefore, systems theorists generally display a certain doubt as to the possibility of controlled interventions in systems.

The field of innovation studies, however, attempts to address the lack of guidance as to policy interventions aimed at the transition of socio-technical regimes with the concept of transition management based on the so-called 'Multi-Level Perspective' (MLP). The MLP was originally introduced by Rip and Kemp (1998) and has since then been conceptually developed (Geels, 2004; Kemp and Rotmans, 2005; Kemp, Loorbach and Rotmans, 2007; etc.) and applied in empirical research (for example Geels, 2005). The MLP attempts to structure the 'seamless web' by establishing a model of governance based on three levels. At the micro-level, there is the *niche* in which technological innovations can be produced.

These technological innovations either fail or they take off and become part of the meso-level socio-technical *regime*. Finally, these processes develop in the context of a macro-level *landscape*. Transitions can be initiated through Strategic Niche Management (Hoogma et al., 2002), and steered through visions, transition experiments and cycles of learning and adaptation (Kemp, Loorbach and Rotmans, 2007).

The multi-level perspective has been criticised in several ways: the lack of explanation as to why some technologies take off, while others never make it; the implementation of the landscape as 'exogenous signals' which ignores important feedback mechanisms (Whitmarsh, 2012: 485); its reductive view of the public as a group of individual consumers as opposed to citizens or members of communities (ibid.); its strong focus on the introduction of new technologies and the resulting lack of conceptualisation of the dynamics of demand and the role of social practices (Shove and Walker, 2010); and, fundamentally, the idea that transitions can be managed.

Shove and Walker (2010) argue that a focus on practices can contribute to conceptualising the demand side in socio-technical systems. The literature which refers to socio-technical systems mostly include practices, for example Rohracher refers to socio-technical systems 'where technical developments and characteristics cannot be separated from institutional structures and the values, interests and *social practices* of the participating individuals and organisations' (2008: 146, emphasis added). In the conceptualisation of the multi-level approach, Rip and Kemp originally also refer to practices: 'Novelty evolves within existing regimes and sociotechnical landscapes, starting at the micro-level of local practices' (1998: 338). However, in the transition management literature the focus at the micro-level turns to niches for the development of technological innovations, and the demand side remains underconceptualised.

Fundamentally, system theorists and others have criticised transition management for creating the illusion that transitions can in fact be managed. Shove and Walker express a concise word of warning: 'We are wary of the notion that transition management, with its accompanying repertoire of concepts and tools, provides a neat model of how managers might intervene (albeit reflexively) to shape and modulate processes of change. We have observed that these approaches can all too easily obscure their own politics, smoothing over conflict and inequality; working with tacit assumptions of consensus and expecting far more than participatory processes can ever hope to deliver' (2007: 768). In view of the political conflicts inherent in the provision of infrastructure and the use of public space, the

analysis of which these concepts of Science and Technology Studies are supposed to support, this critique seems very significant. The next section will therefore review literature which has integrated the practice approach with the concept of socio-technical systems in a way which can contribute to the analysis of interventions in the trajectories of practices, while acknowledging the unpredictable nature of interventions in socio-technical systems.

2.2.4 Practice theories and socio-technical transitions

Several attempts have been made to integrate practice theories with the conceptual work on socio-technical transitions (Shove and Walker, 2010; McMeekin and Southerton, 2012). Shove and Walker (2010) argue that practice theories can contribute to the literature on socio-technical transitions by conceptualising the dynamics of demand. Socio-technical transitions commonly focus on the supply side with the introduction of new technologies, whilst considering the demand as given. Shove and Walker argue that a focus on practices and practitioners can give an insight into how patterns of daily life interrelate and reinforce each other, thereby keeping existing arrangements in place.

McMeekin and Southerton (2012) explore the tensions as well as the shared conceptual foundations of practice approaches and the MLP. They argue that in order to achieve large-scale systemic transitions toward more sustainable ways of life, it is necessary to recognise the interconnections between social relations, production and consumption, and socio-technical systems. They identify three areas which need further conceptual work: the dynamics of social relations in final consumption, the interdependencies between production and consumption processes in sustainability transitions, and the relationship between technologies and consumption within the context of everyday practice.

Watson (2012) goes a step further and uses practice theories to conceptualise the actual socio-technical system. Watson argues that 'from a theories of practice understanding, systems persist and are transformed only through the flow of practices – of action and doing – which comprise them' (2012: 492). Watson therefore suggests recasting socio-technical systems as systems of practice. The performance of a practice does not only reproduce the practice itself, but reproduces the whole socio-technical system in which it is embedded. Equally, any transition of the socio-technical system has to be a change in practices. Practices here are more than the generators of demand through final consumption as in Shove and Walker (2010) and McMeekin and Southerton (2012), but

constitute integral elements of socio-technical systems, simultaneously shaped by them and sustaining them.

Since practice theories have been criticised for their limited explanatory potential with regard to systemic transitions (see Geels, 2010), the suggestion that it is possible to think systemically through practices is a major claim. Geels argues that the focus on local practices makes the methods of practice-based research unsuitable for the analysis of systemic transitions and obstructs the identification of generic patterns (2010: 502-503). However, with the concept of systems of practice, practice theories gain 'potential to illuminate processes across what can be understood as systemic scales, whilst always keeping a grip on how those systems are constituted, reproduced and have presence only through the continued performance of mostly profoundly mundane practices' (Watson, 2012: 491). Watson thereby also resolves the ontological disagreement between theories of practice which are based on a flat ontology (Schatzki, 2011) and the multi-level perspective through which socio-technical systems have frequently been conceptualised.

Following the concept of systems of practice, interventions must be conceptualised as an integral part of the system. Interventions are shaped by the practices and their respective shared understandings which constitute the system of practice. In turn, interventions are not an external force impacting on the system, but take effect as part of the system. As we have learnt from the systems theory approach, changes are not the result of, but rather the response to interventions, and are therefore unpredictable.

2.3 Conclusion: Facilitating a contested practice

The first part of this chapter focused on conceptualisations of practice and presented the most relevant aspects of practice theories with regard to the question how to intervene in the trajectory of a practice. Practices are emergent and dynamic social phenomena which are reproduced through performance. Practices stabilise through forming complex arrangements with co-existing practices and technologies in which practices become normalised. Change is caused through changes of the elements of the practice itself, through learning or experimentation of the individual practitioner or through changes in the systems of practice in which practices are embedded. The reproduction or change of a practice contributes to the reproduction or change of the whole system. Finally, practitioners form a community of practice.

As was shown, practice theories largely describe a general and ideal type of practice. With the exception of Schatzki's integrative and dispersed practices (1996: 91-106) and Warde's (2013) compound practice, only little effort has been made to distinguish types of practices within the general concept. Furthermore, the discussion of boundaries showed that certain practices might challenge elements of the practice definitions. As we will see in the cycling literature review and the first empirical chapter on transport cycling in Santiago, cycling challenges the requirements for shared understanding, teleoaffective structure of the practice, shared interpretation and adherence to rules, and accountability to the other members of the community of practice established within the joint enterprise. All of these criteria of practice can be contested and the empirical analysis of practices might require more flexibility in the practice concept than there is to date.

In the second part of the chapter, I reviewed different approaches to intervening in human activity in order to build a foundation for the question of how to facilitate the practice of urban transport cycling: behavioural approaches, practice approaches and selected concepts from Science and Technology Studies. The practice approach rejects behavioural approaches for their focus on the individual as well as the notion of external interventions. Rather, behaviours are understood as part of the performance of practices and interventions take effect as part of the system of practice. The practice approach shifts the focus of interventions to elements of practices, relationships between practices, careers of carriers and social networks which will all be useful for the analysis of interventions in cycling.

Furthermore, I turned to concepts from Science and Technology studies in order to complement practice approaches in three areas: the conceptualisation of the way in which material shapes social interaction, the politics involved in the development of technologies and material infrastructure, and finally the systems perspective. As a last step, I presented Watson's (2012) approach to integrate socio-technical systems and theories of practice by recasting socio-technical systems as systems of practice in order to open up practice theories to systemic transitions.

This chapter has shown a variety of approaches to interventions in human activity. This research will use a practice approach including the concept of systems of practice in order to explore the main question of this research: how to facilitate practices. This perspective simultaneously allows a focus on the local everyday performance of practices and acknowledges the embeddedness of practices in socio-technical systems. It allows a

systems perspective, while preserving the idea of a flat ontology with its respective research approach. Contrary to approaches which focus on the individual, facilitating is not an invasive approach, such as using social norms to guilt-trip people or using choice architecture to trick people into doing something. Rather facilitating is about socio-technical transitions which normalise the practice in question, thereby making it easy to engage in the practice.

Chapter 3: Literature Review – Cycling

This chapter explores the practice of urban transport cycling. The first part of the chapter will focus on cycling as a practice, focusing first on the negotiation of the tasks of which cycling consists as well as the bodily and emotional experiences of cycling, its community of practice and its relations to driving. I will argue that cycling is characterised by inherent conflicts which are expressed in the multiple ways in which the practice is performed and experienced by its carriers and the multiple meanings associated with the practice. Furthermore, the competition with driving as the currently dominant practice-material arrangement across most of the globe or 'system of automobility' (Sheller and Urry, 2000; Urry, 2004) presents another inherent conflict of the practice to which I will refer throughout this thesis.

The second part of the chapter briefly summarises the main benefits of cycling which are commonly used as justification for policy interventions aimed at promoting and facilitating the practice. Four arguments are covered here: cycling is environmentally friendly by contributing to a reduction in carbon emissions as well as air and noise pollution; cycling improves public health, mainly through the positive effects of physical exercise; cycling enhances social sustainability because it is an efficient mode of transport in terms of time and financial resources and, therefore, facilitates access to goods, services and activities; finally, cycling improves the livability of urban public spaces.

The remaining part of the chapter will address current and potential policy interventions aimed at facilitating urban transport cycling. In part 3 of the chapter, I will focus on conventional concepts and policy interventions. Numerous approaches have been suggested and implemented and a full review would go beyond the scope of this work. Therefore, I will limit this review to the literature on those approaches which I found to be relevant in the case study. I will first critically discuss the concepts of barriers and cycling culture, which are commonly referred to in the academic literature as well as in policy approaches. I will argue that both the idea of fixed barriers as well as the notion of cycling culture may be useful as descriptive shorthand but cannot be used as explanation for cycling rates. I will then turn to the two controversial approaches of cycling campaigns and segregated cycle paths. I will argue that both cycle campaigns and the provision of cycle paths can contribute to the construction of fear of the practice and need to be implemented with care in order to achieve the intended positive effect on cycling rates.

In part 4 of the chapter, I will use the theoretical insights from chapter 2 in order to develop some thoughts about facilitating the practice of urban transport cycling. I will first argue that systems theory teaches us to pay attention to small-scale interventions because they can have great effect through feedback loops and tipping points. I will then argue that facilitating cycling requires taking into account the socio-technical system in which the practice is embedded. A successful approach to facilitating cycling must take into account the relation between competing practices and co-dependent practices and include a city perspective. The city and the dominant system of automobility provide the context in which efforts are made to facilitate cycling.

It must be noted that the literature reviewed in this chapter does not specifically focus on cycling in Santiago de Chile nor on the specific challenges of facilitating cycling in cities in the global South (with the exception of UN-Habitat, 2013). Practices are locally embedded and, therefore, straightforward generalisations from this literature would be inappropriate. In studying examples from the global North, I followed Schatzki's notion of the value of ideal type conceptualisations which 'lies in suggesting to an investigator what to look for in particular cases' (2011: 24). This chapter presents insights from different places which served as valuable ingredients to my thinking, as starting point for the fieldwork and later as reference points for the analysis. As this chapter and the empirical chapters will show, there are certain characteristics of cycling which are similar in various settings and, therefore, it seems justified to include this selection of literature here.

3.1   What is urban transport cycling?

Several different forms of cycling can be distinguished. The edited volume *Cycling and Society* (Horton, Rosen and Cox (eds.), 2007) includes racing cycling, utility and commuter cycling, leisure cycling and bicycle messengering. Other kinds of cycling can be added, such as cycle touring, children's cycling and mountain biking (Horton, Cox and Rosen, 2007: 1-2). Some categories are somewhat fuzzy and performances can fall into two categories at the same time. The focus of this thesis is transport cycling[2] and other categories of cycling will only be included in the analysis as far as they intersect with transport cycling. Transport cycling can include trips to shops and services as well as commutes to work or visits to family or friends. Here, cycling is not the purpose as such, but the means to mobility.

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[2] Transport cycling will here be used as synonym to utility cycling. The reason for the term transport cycling comes from the fieldwork where the distinction of cycling as a mode of transport and cycling as recreation was often stressed by the research participants.

In this part of the chapter, I will explore transport cycling as a practice. The first section will focus on cycling as performance. This part will show that cycling is not a uniform practice, but rather the tasks of cycling can be approached and performed in different ways by the participants, according to situational circumstances, material arrangements and personal preference.

The focus on utility or commuter cycling has been criticised because it is concerned primarily with the purpose of the trip which is reaching the destination and thereby often neglects the sensory and emotional experiences during the journey which are meaningful as well (Spinney, 2007; Aldred, 2012). While this work focuses on transport cycling, it will attempt to avoid this shortcoming by including the bodily experience (section 3.1.2) and the emotional experience (section 3.1.3) in this literature review and the empirical chapters. I will argue that the material arrangement, including the bicycle, cycling infrastructure and accessories script the performance and mediate the bodily experience of the practice and is therefore significant in the debate with regard to facilitating the practice. As to the emotional experience, the practice appears to include a broad range of emotions which vary according to the experience of the practitioner and the situational circumstances.

The fourth section will focus on the community of practice. In view of the different bodily and emotional experiences of the practice, it is not surprising that the community of practice of urban cycling is often characterised as divided or fragmented. I will argue that there is only a small amount of shared understanding and joint enterprise and shared repertoire in the community of practice.

The fifth part will address transport cycling in relation to driving. This thesis will follow John Urry's (2004) argument that the system of automobility has normalised driving and thereby marginalises other mobility practices such as walking and cycling which are repositioned as dangerous.

3.1.1 The performance: the negotiation of cycling tasks

Transport cycling is performed in various different ways. The practice consists of various tasks, such as finding a route, negotiating traffic, locking up the bicycle at the destination, and storing the bicycle at home. Each task can be approached and carried out in many different ways by cyclists, depending on situational and infrastructural circumstances as well as personal preferences.

In the literature, different strategies of negotiating traffic are described. Spinney shows the different approaches of two London commuter cyclists on Vauxhall Cross, one trying to reduce information overload by slowing down, the other minimising the speed difference between the cars and himself by cycling as fast as possible (2007: 38). Fincham (2006) vividly describes some risky manoeuvres of bicycle messengers and the way they negotiate traffic and risk. In his own field diary, Fincham compares his approach to red lights to that of a colleague: 'I never stop for red lights unless I think I will definitely get knocked off, but I do slow down!' (2006: 216). The task of selecting a route is also approached in different ways. Some cyclists will select the quickest route, while other cyclists may prioritise pleasantness or safety even if that results in a longer journey time (Parkin, Ryley and Jones, 2007: 70).

Storing the bicycle at home or at the destination of a journey depends on the availability of appropriate facilities for bicycle storage, the risk and fear of theft, vandalism and the damage expected from weather wear. Aldred (2012) observes that in some high density urban areas in the UK, it is quite common that bicycles need to be accommodated in living spaces. Furthermore, at the destination people used 'a variety of strategies – changing or adapting the bicycle itself, changing their own routines, adapting places and actively selecting new places – to counter the threat of theft or damage' (ibid.: 21). The risks of theft or damage restrict the use of high quality equipment, which has an impact on the cycling experience (see also Lovejoy and Handy, 2012: 96).

In conclusion, cyclists adapt their performance to personal preferences as well as situational and infrastructural circumstances. The way in which the performance is adapted and the tasks are negotiated affects the experience of the practice, to which we will turn in the following two sections.

3.1.2 Cycling as a bodily experience mediated by the material arrangement

Cycling is a physical activity which is made possible through the energy of the body and in turn has an effect on the physical fitness of the cyclist. The bodily experience has mostly been described in accounts of racing endeavours which are often a 'romanticised mix of pain, passion and pleasure' (Horton, Cox and Rosen, 2007: 10; a critical review of some such accounts can be found in Forester, 1993: 490-504). Not much has been written about the bodily experience of urban transport cycling, which reflects Spinney's (2007; 2009)

observation that spaces of mobility have largely been treated as relatively meaningless, thereby also disregarding the experience of the journeys that happen between the point of origin and the destination of a journey (see also Cresswell, 2010). Two exceptions are the fascinating accounts in Spinney's (2007) work on the sensory experience of 'cycling the city' and Fincham's (2006) work on the specific experience of bicycle messengers negotiating traffic and risk.

A significant aspect of the bodily experience is the performance in the context of a specific material arrangement, including the bicycle, the built environment and infrastructure as well as dress and accessories for cycling. Lovejoy and Handy argue that the appropriate equipment 'can contribute to greater safety, convenience, comfort, and enjoyment, potentially enhancing the effectiveness of other efforts to promote utilitarian cycling' (2012: 75).

The bicycle is the most obvious material element of the practice of cycling. Much has been written about the invention and development of the bicycle (Sharp, 1977/1896; Woodforde, 1970; Ritchie, 1975; Bijker, 1995; Lovejoy and Handy, 2012). A review of this literature would go beyond the scope of this work, but it is noteworthy that while a great variety of models existed throughout the history of the bicycle, today one model dominates the market, which is 'the present-day rear-driving bicycle, with diamond-frame, extended wheel-base, and long socket steering-head' (Sharp, 1977/1896: preface). However, within this model, there are many bicycle types, including Dutch bikes or 'Roadsters', city or hybrid bikes, mountain bikes, road or racing bikes, fixed-gear single speed bikes, cargo cycles, folding bikes and electric cycles (see Lovejoy and Handy, 2012 for a detailed description).

The different bicycle types shape the performance of urban transport cycling. Each specific bicycle design scripts a certain posture on the bicycle while riding and stopping (Lovejoy and Handy, 2012: 88), which shapes the performance. On a road bike the saddle is level with or higher than the handlebars which forces the cyclists to bend down into an aerodynamic posture and angle her head to view the road (ibid.). Road bikes are generally lighter than other bicycles, even more so if they are single speed bikes. Posture as well as the light weight facilitate cycling at high speed. On the contrary, the handlebars of a Dutch bike are generally higher than the saddle and bent backwards, which allows the rider to sit in an upright posture (ibid.), which generally affords lower speed but greater comfort. The effect of the bicycle type on the style of performing cycling is described clearly in an

interview quote in Spinney (2007). The interviewee here describes how she rides more slowly on her Dutch bike because the breaks are not as good as on her racing bike, her visibility is better through the upright posture and she has got 'a lovely view' and it feels 'meditative' and 'more laid back'. Riding her racing bike requires 'attention to the more immediate things' as she rides faster and takes more risks (quoted in Spinney, 2007: 34). The materiality of the bicycle, the components and the design, therefore, afford certain performances.

Another important material element from the beginning of cycling was the surface on which the practice is performed (Parkin, Ryley and Jones, 2007). The struggle with the conditions of the roads during the last two decades of the 19th century is expressed in the following quote: 'The labour of forcing it along any ordinary rough road is calculated to be nearly equal to that of walking, but up an incline it is infinitely greater—greater, in fact, than if the traveller had to carry the velocipede.' (The Spectator, 1869, quoted in Woodforde, 1970: 25). Later, the conditions of the roads were the 'only obstacle […] to the use of the cycle becoming universal' (Earl of Albemarle, 1887, quoted in Woodforde, 1970: 3). It is no surprise that the first pedalled Michaux velocipedes from France were nicknamed 'boneshakers' in England (Woodforde, 1970: 20). Although the expenditure on road maintenance in England and Wales increased by 85 percent between 1890 and 1902, local roads remained uneven and it was only with the appearance of the car after 1910 that a serious effort was made to seal roads with tar (ibid.: 3ff).

The invention of rubber bicycle tyres significantly changed the experience of cycling and today the suspension technology, originally developed for mountain biking, can provide some additional comfort on rough surfaces (see Lovejoy and Handy, 2012: 90-91). Nevertheless, the road surface is still relevant, especially for users of road bikes. As Spinney puts it in his ethnographic fiction: 'I choose not to follow the main artery along the south side of the Thames primarily because I know from bitter experience that the section of tarmac between London Bridge and Waterloo Bridge heading west is so lumpy it makes your head spin' (2007: 37). This quote from an experienced urban cyclist shows that infrastructure which is appropriate for driving and therefore 'invisible' (see Pinch, 2010) to the driver of a motorised heavy vehicle, may present a real obstacle for riding a light-weight bicycle.

Infrastructure is also significant in the way it does or does not give cyclists priority vis-à-vis other participants in traffic. Having to slow down or stop and then start and speed up again

requires additional effort and affects the overall power consumption of a journey (Parkin, Ryley and Jones, 2007: 75). Additionally, the design of cycleways can exclude certain users and uses. New cycle models and other human powered vehicles may require different infrastructure design (Cox, 2008), for example narrow cycleways exclude tricycles and certain cargo cycles (Pardo, 2009). Cycling side by side, which generally makes cycling a more social activity and is especially important when cycling with children, also requires a certain width of the cycleway (Kuijper and Braakman, 2009).

Finally, clothing and accessories can significantly change the cycling experience. While Lovejoy and Handy point out that '[t]he need for special clothing or personal accessories is counter to the idea that bicycling should function just like any other mode of transportation' (2012: 96), they also state that cyclists can benefit from specialised textiles which keep them cool, warm or dry or which enhance visibility (ibid.). However, the question of dress is complicated and very much linked to reputational risk and judgement. While the lycra of sports cycling or the urban cycling uniform of high visibility jacket and helmet can be off-putting (Daley and Rissel, 2011: 214), the new cycle chic propaganda can be as problematic because it puts even more pressure on cyclists to look good while doing physical exercise (Aldred, 2012: 25). It is therefore not surprising that Lovejoy and Handy point out that new waterproof and retroreflective materials 'masked in tasteful neutral tones' (2012: 96) have become available today. Finally, while accessories such as panniers, lights and the lock can facilitate the cycling journey and make it safer, Aldred (2012) points out that managing these accessories is an additional burden on the cyclist with which drivers are not confronted. In conclusion, for efforts to facilitate cycling it is important to acknowledge the multiple ways in which material shapes the cycling experience and the burden inappropriate material elements, including the bicycle, cycling accessories and infrastructure, can present to the cyclist.

3.1.3 Cycling as an emotional experience

The bodily activities of practices include mental and emotional activities (Reckwitz, 2002b). Immediate emotions of cycling described in the literature are mostly positive. In the early days of cycling, the use of the highwheel bicycle produced a sense of adventure (Woodforde, 1970), and still today the terms 'buzz', 'excitement' and 'adventure' are used to describe cycling (Daley and Rissel, 2011: 213). Furthermore, cyclists describe feelings of freedom and independence (ibid.), thrill (Woo, Helton and Russell, 2010), and some cyclists even embrace the risks of traffic, the need to be assertive and the feeling of being 'an

urban warrior on a bike' as empowerment (Steinbach et al., 2011: 1128). Furthermore, cycling is described as relaxing, meditative practice (Spinney, 2007: 34), and an escape or relief from other worries (Daley and Rissel, 2011: 213; Aldred, 2012: 29) and includes feelings of enjoyment and nostalgia (Aldred, 2012).

Feelings associated with a practice are not limited to the moment of the performance. The practice of cycling can contribute to a cycling identity which endures between performances. Cycling enthusiasts often describe their engagement in the practice like 'a kind of love affair with the bike and the cycling life' (Horton, Cox and Rosen, 2007: 6), which shows that cycling may not be limited to the performance but can become a way of life. This is confirmed by descriptions of the strong emotional impact of bicycle theft, e.g. as having a part of oneself taken (Aldred, 2012: 21).

Cycling is not only associated with positive feelings, however, but also with fears. According to Forester, the media has portrayed cyclists in two ways: 'as delaying real traffic, disobeying the traffic laws and getting killed for both sins' or as 'helpless victims of dangerous motor traffic' (1993: 504). These negative images of cyclists have produced several fears in society associated with cycling and becoming a cyclist: the fear of injury through traffic accidents, the fear of violence or harassment, and the fear of damage to one's reputation.

Although many studies show that the health benefits of cycling outweigh the traffic dangers (Garrard, Rissel and Bauman, 2012), the fear of injury through traffic accidents is an important barrier to cycling (Horton, 2007). While acknowledging that the fear is real, several authors have pointed out that fear is not a natural part of cycling, but rather that it is constructed. While driving has become normal, cycling has increasingly been portrayed as dangerous practice through road safety education, helmet promotion, and the relocation of cycling to the 'safe space' of segregated cycleways (Horton, 2007: 137-147; see also Forester, 1993; Franklin, 2002). Many people therefore perceive cycling as risky activity. It is noteworthy, however, that the fear associated with cycling in traffic is mainly expressed by non-cyclists and decreases with increasing cycling experience and competence (Daley and Rissel, 2011: 213-214).

The fear of violence or harassment on the road and fears linked to reputation are both linked to the perception of being exposed and vulnerable without the protection of the private car. As driving is perceived as normal and driving takes place in 'a rolling private-in-

public space' (Sheller and Urry, 2003: 115), a capsule which separates and protects the driver from the outside world, cycling suddenly appears as practice which exposes its carrier. Without the metal capsule, cyclists are not only exposed to the elements, weather, sounds and smells of the environment, they are also in direct contact with other people. This can make people feel vulnerable to assaults and harassment. Furthermore, cyclists are no longer protected from view as in a car and are exposed to the judgements of others with regard to their physical appearance during the performance (Horton, 2007: 134). Anxieties with regard to cycling skills, body, physical fitness and appearance, including experiencing physical limits and sweating (ibid.: 135) are exacerbated by the requirement of performing physical exercise in public, or as Horton puts it of 'working one's (perhaps 'unsightly', perhaps 'sightly', certainly gendered) body in public' (ibid.: 134).

Finally, fear is not limited to the risks of the practice but also refers to the community of practice. Research has found that surprisingly the image of cycling as a practice can differ from the image of cyclists (Daley and Rissel, 2011: 213). While there are quite positive views of cycling, cyclists are often stigmatised as risk-takers and law-breakers who endanger not only their own lives but those of the other participants in traffic (ibid.: 213-214; Aldred, 2013). Non-cyclists can therefore fear becoming or being forced by necessity to become a member of this marginalised and stigmatised community (Horton, 2007). Cyclists themselves are also affected by the negative images: while most want to be competent as to dress, riding skills and bicycle maintenance, many distance themselves from the image of 'hardcore cyclist' which is associated with excessively high physical fitness and lycra outfits (Aldred, 2013).

The experience of the performance can evoke a broad range of momentary emotions and additionally there are various emotions associated with the practice as entity. There are several kinds of fear linked to cycling. These fears are mainly experienced by non-cyclists and novices to the practice and are therefore a significant barrier to cycling, although they decrease with competence. Understanding the positive emotions linked to cycling as well as the fears associated with the practice and its community is crucial in order to facilitate the practice.

3.1.4 The divided community of practice

Becoming a competent urban transport cyclist is a learning process from the basic skill of riding a bicycle to the more advanced skills of selecting routes and negotiating traffic. It

also includes acquiring skills in cycling-related practices such as bicycle maintenance and adapting other practices, such as showering, dressing, grocery shopping etc., to this specific mode of transport.

According to Wenger (1998), learning occurs within a community of practice. The community of practice establishes the requirements of a competent performance and instructs novices. Forester describes that before the 1970s most adult cyclists in the US received training in cycling clubs where they were instructed by experienced cyclists (1993: 506). This account seems to coincide with Wenger's (1998) theory of learning within a community of practice. However, since 1970 new adult cyclists seldomly joined clubs (Forester, 1993: 506). According to Forester, these new cyclists lacked the instruction by experienced cyclists and relied on misguided bicycle safety classes taught by non-cyclists whose message was that with the increase in motorised transport cycling in traffic was unsafe and that the roads should be kept clear (ibid.: 505-515). While experienced cyclists still cycle in traffic and consider this the most effective and the safest option, new cyclists perceive this type of performance as risky.

Similarly, in the UK context divisions in the community of practice have become evident, and there are strong disagreements about the appropriateness of certain actions. Some cyclists systematically break traffic rules, e.g. by ignoring red lights (Fincham, 2006) or by cycling at night without lights (Aldred, 2013). Wenger argues that competence is defined locally by the community of practice and can include breaking societal conventions and rules (1998: 40). However, the breach of traffic rules is not only criticised by society in general. Other cyclists distance themselves from 'dangerous' and 'irresponsible' manoeuvres, especially those actions which breach traffic rules (Skinner and Rosen, 2007; Aldred, 2013). At the other extreme, Aldred describes that some cyclists defined 'being a good cyclist' as keeping out of the way of motorised vehicles (2013: 264-265). According to Aldred, many cyclists in Hull perceive cycling on the road as dangerous and therefore cycle on the sidewalk (ibid.: 266), which again is a breach of the traffic laws. On the contrary, cycle training in the UK promotes cycling on the road. For example, the cycle training organisation 'BikeRight!' offers to help 'boost your confidence, skills and cycling techniques for today's traffic' and to 'show you how to tackle busy roads and junctions with ease and confidence' (BikeRight!, n.d.).

Although the community of practice does not have a joint enterprise which would establish general accountability among all cyclists, the practice is not performed in completely

individual ways by each cyclist either. Rather, cyclists appear to form loose groups, in which the practice is performed in similar ways and certain rules are jointly respected (even if that is the 'rule' of breaching the traffic regulation).

3.1.5   Cycling in relation to driving

Throughout its history, the practice of cycling has co-existed and competed with other mobility practices, such as walking, horse-riding, riding in a private or public carriage, driving a car, or using public transport. The competition between mobility practices is twofold and refers to carriers of the practice as well as road space for the performance, and is fundamentally linked to the social status and understanding of the practice.

Sheller and Urry argue that the emergence of the car has created societies of automobility (2000: 738). Automobility can be defined by six elements. It is the 'quintessential manufactured object' which has shaped key characteristics of capitalist industrial production; a 'major item of individual consumption'; a 'powerful machinic complex' which is linked to other manufacturing and petrol industries, infrastructure and service provision, urban land-use planning etc.; the 'predominant global form of 'quasi-private' mobility' which marginalises other mobility practices; the 'dominant culture that sustains major discourses of what constitutes the good life'; and finally, the 'single most important cause of environmental resource-use' (summarised from Sheller and Urry, 2000: 738-739).

The emergence and normalisation of driving have transformed cities and mobility needs (Sheller and Urry, 2000; Urry, 2004). With individual motorised mobility, greater distances can be travelled. This has changed urban land-use patterns, for example it allowed huge retail parks in the outskirts of the city which could only be accessed by car and facilitated urban residential sprawl as longer commuting distances could be managed (Sheller and Urry, 2000). These new land-use patterns in turn led to a lock-in of the 'system of automobility' (Urry, 2004) and ever rising numbers of cars which produce severe traffic congestion in most metropolitan areas across the globe.

In this context, cycling and driving compete for road space. The major issues here are the difference in speed and the imbalance of safety. Cyclists can perceive it as intimidating when cars overtake them too closely and at great speed (Daley and Rissel, 2011: 215). Furthermore, in the case of an accident the driver has some protection from the car whilst the cyclist is much more vulnerable: 'Protected by seatbelts, airbags, 'crumple zones', 'roll bars' and 'bull bars', car-dwellers boost their own safety and leave others on the road to

fend for themselves' (Sheller and Urry, 2003: 115). Some cyclists therefore avoid the conflict and retreat to the sidewalk. However, the speed differential between cyclists and pedestrians is similar in proportion to that between cyclists and motorised traffic (Daley and Rissel, 2011: 215) and cycling on the sidewalk can produce significant public outrage (Aldred, 2013).

The competition for carriers is mainly shaped by the dominance of driving and the associated images of driving and cycling. The normalisation of driving has marginalised walking and cycling and is expressed in the expectation that cycling is only for young people who will switch to the car as soon as they are old enough and can afford to do so (Daley and Rissel, 2011: 214). Therefore, cycling can be seen as an activity exclusively for non-adults and a mode of transport which would only be kept up out of necessity.

Furthermore, the normalisation of driving has also produced an image of cycling as dangerous and a portrayal of cyclists as reckless. As there is a general idea that cycling is dangerous, cyclists are often blamed in the event of an accident for taking the risk of cycling (Aldred, 2013: 268), an attitude that according to Pucher, Komanoff and Schimek 'permeates the reactions of everyone from police and courts to the cyclist's own family and friends and contributes to cyclists' marginal status' (1999: 647).

3.2 Why should we facilitate cycling?

Cycling is increasingly promoted across the world as sustainable mode of transport and response to several important contemporary challenges. First, cycling is promoted as environmentally-friendly mode of transport, since it consumes far fewer non-renewable resources than motorised transport and, therefore, contributes to reductions in greenhouse gas emissions. Further, contrary to motorised transport, cycling produces practically no air pollution or noise pollution, which are not only environmental issues, but also concerns for public health. Finally, cycling can contribute to the mitigation of urban traffic congestion as it is significantly more efficient in the use of public space (Godefrooij, de Jong and Rouwette, 2009: 7) and thereby further reduces air pollution.

Second, cycling is promoted because of the health benefits from physical exercise. The lack of physical activity is the leading risk factor for global mortality and accounts for 6 percent of deaths globally (World Health Organization, 2013). With increasingly sedentary lifestyles, obesity and its linked diseases, such as coronary heart disease, type 2 diabetes,

osteoarthritis, several cancers, and mental health problems (Davis, Valsecchi and Fergusson, 2007), have become a major concern in public health. Davis, Valsecchi and Fergusson (2007) actually attribute the growth in car travel directly with obesity through the decrease in physical activity through walking (and cycling). The authors, therefore, recommend a reversal in travel patterns from driving to more active transport. The WHO agrees that '[r]egular and adequate levels of physical activity in adults:

- reduce the risk of hypertension, coronary heart disease, stroke, diabetes, breast and colon cancer, depression and the risk of falls;
- improve bone and functional health; and
- are a key determinant of energy expenditure, and thus fundamental to energy balance and weight control.' (World Health Organization, 2013)

While any form of physical activity can contribute to the above mentioned benefits, transport cycling seems especially promising since it is likely to be performed regularly and kept up as opposed to leisure cycling or cycling in a gym (Garrard, Rissel and Bauman, 2012: 33). However, the environment in which transport cycling is performed has a significant effect on the health benefits. Although the benefits of cycling far outweigh its health risks, it is noteworthy that fatality and injury rates differ extremely between countries, with far higher risks in low-cycling countries (Buehler and Pucher, 2012: 17-19). Also, the mental health benefits in terms of preventing and treating depression and anxiety as well as enhancing emotional well-being through 'relaxation, stress reduction, fun, enjoyment, and social interaction' (Garrard, Rissel and Bauman, 2012: 38) can be offset through the psychological distress associated with the actual and perceived risks of cycling in traffic, social discrimination and harassment of cyclists (ibid.: 39).

Third, cycling is promoted as an efficient mode of transport in terms of financial and time resources and therefore as enhancement of social sustainability in terms of accessibility to basic goods, services and activities (UN-Habitat, 2013). Accessibility requires affordable and reliable transportation. Currently, in cities in developing countries travel can consume 25 percent of daily wages and people can spend several hours commuting to work (ibid.). This socio-spatial form of exclusion has been termed 'mobility-exclusion' (Urry, 2002: 265). Travel costs in terms of money and time can also inhibit access to other essential needs (UN-Habitat, 2013). The effectiveness of the bicycle compared to the car becomes greater with rising traffic congestion in the city. A more innovative way of calculating travel speed is introduced by Tranter (2012) with his concept of 'effective speed' which does not only include the travel time, but also the working hours required to be able to afford the

respective mode of transport (bicycle or car). According to this calculation, the bicycle is even more efficient as a bicycle is cheaper than a car with respect to purchase as well as maintenance.

Finally, cycling is part of a broader discourse of 'livability' (Krizek, Handy and Forsyth, 2009; Gardner, 2010) which 'includes concern for accessibility, the allocation and design of public space, opportunities for social engagement and recreation, and the overall health and economic welfare of city residents' (Goldman and Gorham, 2006). This concept views the increasing motorisation of public space as problematic and aims at a redistribution and rethinking of the role of public space. These ideas promote a shift from the 'quasi-private mobility' (Sheller and Urry, 2000: 739) to the more public mobility of walking and cycling. This idea coincides with some approaches from 'crime prevention through environmental design' which support social interaction and promote 'eyes on the street' (Cozens, Saville and Hillier, 2005: 342). Also, promoting cycling often holds the hope of local economic development through regeneration of urban centres (see Brand, 2008) and lesser accidents through more cooperative traffic, possibly in shared spaces (see Hamilton-Baillie, 2008a). Cycling is thereby not only an environmentally-friendly, healthy and efficient form of mobility, but also contributes to a more pleasant experience of public space for all.

3.3   Conventional approaches to promoting cycling

3.3.1   Barriers to cycling and cycling culture

In this section I will present two approaches to research on the evolution of cycling and policy interventions in the trajectory of cycling, barriers and cycling culture. I will argue that both concepts need to be viewed critically in the way they are sometimes applied, but that a practice approach can provide a more useful conceptualisation of both approaches.

Much research into cycling as well as policies to promote cycling is based on the assumption that there are certain barriers to cycling and that people will choose to cycle as soon as these barriers are eliminated (Parkin, Ryley and Jones, 2007; Bauman et al., 2008; Godefrooij, de Jong and Rouwette, 2009; de Geus et al., 2008; etc.). Examples for interventions to eliminate barriers are manifold: subsidising bicycles, providing specialised cycling infrastructure, including cycling in the school curriculum, providing cycling information and maps, image campaigns etc. Some authors criticise the one-dimensional approach and acknowledge that there might be multiple barriers and recommend a multi-

faceted approach which combines several of the above measures (Jones, 2012; Pucher and Buehler, 2008; Bauman et al., 2008; see also Pucher, Dill and Handy, 2010 for an international review).

These approaches are based on the questionable assumption that barriers are fixed. Gatersleben and Appleton (2007), however, show that as people start to engage in the practice, their perception of barriers change. Additionally, Skinner and Rosen argue that barriers are fluid and can change according to a person's personal circumstances: 'There is a risk […] of a concept such as 'barriers' to cycling conveying a notion that such barriers are fixed and obdurate. On the contrary, whilst there are factors that prevent individuals from cycling, these are fluid and vary according to somebody's personal circumstances: not just how experienced they are at cycling on the road but also their age, gender, employment situation, geographical location and so on' (2007: 85). Barriers can change through growing experience as well as through changes in individual life situations.

Equally critical, at the other extreme of levels of aggregation for social analysis, is the assumption that the notion of cycling culture has explanatory power. While the term culture is often used descriptively as a shorthand for stabilised socio-technical systems, e.g. dominant culture (Sheller and Urry, 2003: 115) and automobility culture (Urry, 2004: 26), sometimes culture is used as an explanation or cause, as justification for a certain type of intervention or as explanation for a low cycling rate. For example in a comparative approach, de la Bruheze argues that while in Basle, Hanover and Copenhagen the reversal in bicycle policy in the late 1970s and 1980s led to an increase in cycling, no bicycle revival occurred in Manchester and Antwerp 'probably *because* bicycle use had declined too far in the meantime and because a material and social bicycle culture had disappeared' (2000: 4, emphasis added). However, de la Bruheze does not detail what bicycle culture means. Latour criticises the use of the social, social factors or the social dimension to explain non-social phenomena (2005: 3) and equally mentions 'culture' as a similar abstract notion of context which does not add to the explanatory power of the network in actor-network-theory, but instead risks drowning the interesting actors (ibid: 147-8).

Here, practice theory allows a useful meso-level focus: instead of seeing barriers as dependent on individual life situations, a practice approach could conceptualise barriers as socially constructed within the shared understanding of the practice. Barriers would then change with developments in the practice or the socio-technical system in which the practice is embedded. A cycling culture could be conceptualised as the stabilised state of a

system of practice in which cycling has become normal, a 'system of velomobility' (Watson, 2013). As socio-technical systems stabilise and evolve through the performance of the practices which constitute them (Watson, 2012), cycling culture can only be the result, but not the cause of or explanation for stabilisation.

3.3.2 Cycling campaigns

One of the most common ways to promote behaviours is through information campaigns. In the case of cycling, the campaigns approach has been problematic. The most common theme for cycling campaigns has been cycling safety. These campaigns underline the necessity of wearing helmets, being visible (through lights and high visibility clothing) and to ride in a certain way (riding predictably, taking the lane etc.). However, by detailing the measures that (supposedly) make cycling safe, the main message that is communicated portrays cycling as unsafe. Horton (2007) argues that cycle safety campaigns actually contribute to the construction of fear. Additionally, the use of cycling safety campaigns is questionable because Hoffman et al. (2010) actually find no statistical relationship between incidence rates of traumatic events as well as serious traumatic events and rider demographics, safety practices, or experience levels of the 962 commuter cyclists whom the authors followed for a year. The authors conclude that injury prevention should focus on improving the cycling environment.

A different approach is to stress the benefits of an activity, such as in the case of cycling the environmental and/or the health benefits. Pooley et al. (2013) argue, however, that the complex arrangements of everyday life often limit the possibilities for a simple substitution of the car through the bicycle. Additionally, social norms research shows that campaigns can be problematic if the activity is shown as something very few people do, as that can actually confirm driving as the desirable norm (Cialdini, 2003). In this context, Horton (2007) argues this kind of outside pressure from information campaigns based on the benefits of cycling can actually make people anxious about the prospect of being forced to become a cyclist and having to deal with the attached stigma. This can lead to a more negative attitude towards the practice than if that pressure had not been applied.

Finally, Woo, Helton and Russell (2010) argue that some cyclists, especially men, engage in the practice mainly for the bodily pleasure and the thrill of the (perceived) risk of cycling, rather than for any social or environmental benefits, or even other personal benefits. The

authors argue in favour of a differentiated approach which acknowledges the differences between users and designs messages accordingly.

3.3.3 Segregated cycle paths

Most efforts to increase urban transport cycling are concentrated on providing segregated cycling facilities (Cox, 2008: 140). While cycling has many different variations which co-exist, there is one divide which causes significant conflict between cycling advocates: the division between proponents of vehicular cycling (Forester, 1993) and those who promote a physical separation of motorised and non-motorised traffic. Horton summarises: 'tensions around the proper place of cycling constitute a major new battleground of mobility and sustainability conflicts in the twenty first century' (2007: 144).

While segregated cycle paths are generally introduced as measure to make cycling safer and more convenient, there has been a long-standing suspicion that these segregated facilities are actually built to facilitate driving. Already in 1937, we can find the following comment by the Cyclists' Touring Club: 'It is impossible to escape the conclusion that most people and organisations who advocate cycle paths are not actuated by motives of benevolence or sympathy, although they may declare that their sole concern is the welfare of the cyclist … A great deal of the cycle-path propaganda is based on a desire to remove cyclists from the roads. That is why the request for cycle paths is so often accompanied by a suggestion that their use should be enforced by law. Therein lies a serious threat to cycling' (Cyclists' Touring Club, 1937: 11-12, quoted in Horton, 2007: 143). This situation has not changed and still today the argument exists that cycle paths are introduced in order to facilitate the flow of motorised traffic, not to enhance the safety or comfort of cyclists (Forester, 1993; Franklin, 2002).

Proponents of vehicular cycling argue that cyclists should act like other vehicles, because that makes them predictable and visible. Segregated cycleways remove cyclists from sight and therefore increase the risk of accidents at intersections. Not only segregated cycle paths are opposed by the proponents of vehicular cycling but also cycle lanes, space for cycling on the carriageway visually separated by road markings. The reason for this is that vehicular cycling includes moving into or 'taking the lane' in order to avoid the typical 'right hook' situation in which a motorised vehicle overtakes a cyclist before an intersection and then cuts the cyclist off by turning. The cycle lane discourages cyclists from moving into the lane and reduces motorists' acceptance of cyclists outside the dedicated cycling space.

The reason for the vehement opposition to segregated cycling facilities is the fear that once they are built, cycling will be banned from the carriageway, either by regulation or by the increased risk of cycling on the carriageway. Cycling on the cycle path can be made obligatory by law, in which case the cyclists lose the right to cycle on the carriageway. Even if there is no regulation, the expectation of motorists that cycle paths are the place to cycle renders 'the cyclist-on-the-road as ever more out-of-place' (Horton, 2007: 144) and thereby increases the risk of cycling on the carriageway. Additionally, even if the use of the cycle path is not made obligatory, its provision reduces the number of cyclists on the carriageway and thereby counteracts the safety in numbers phenomenon, which describes the process by which an increase in cyclists on the carriageway produces an adaptation in driving to a style which better accommodates other road users (Jacobsen, 2003). Especially in view of the overwhelmingly poor quality of cycleways in most countries, and the required reduction in speed on the vast majority of cycleways as compared to the road, a ban from the road would mean a significant deterioration of the conditions for transport cycling.

Instead of segregating modes of transport, new approaches promote their integration and a more cooperative interaction on the road at lower speeds. The most common approach in this respect is the introduction of shared spaces (Hamilton-Baillie, 2008a; 2008b). Hamilton-Baillie argues that the policy of segregation may have unintentionally contributed to the decline in walking and cycling by reducing accessibility for non-motorised transport and failing to deliver the anticipated safety benefits (2008b: 133). Shared spaces intentionally lack rules, predictability and certainty so that 'drivers have to rely on cultural signals and informal social protocols. Speeds reduce, eye contact becomes the norm, and the driver becomes a part of her or his social surroundings and context' (ibid.).

3.4   Facilitating the practice of urban transport cycling

This part of the literature review will discuss two ideas that have emerged from the combination of the practice approach and the STS concepts as a conceptual platform to reframe the challenge of facilitating urban transport cycling. I will first argue that the systems perspective gives small-scale interventions new importance as they can induce great changes. In the second section, I will argue that facilitating cycling requires a focus on the competing as well as the co-dependent practices. Facilitating cycling requires the simultaneous dismantling of the dominance of driving and this in turn requires a city

perspective which takes into account land-use patterns, mobility requirements and inequalities in the city.

3.4.1 The importance of small-scale interventions

According to Shove, Pantzar and Watson (2012), when existing practice arrangements are eroded and a new practice is systematically prioritised, the dynamics of practices can produce positive feedback loops. This thought has been developed in more detail in Urry's (2004) conceptualisation of complex systems. Although a system achieves a certain stability in equilibrium which makes it durable, change is possible and occurs in non-linear ways. Based on Gladwell (2000), Urry refers to tipping points which 'involve three notions: that events and phenomena are contagious, that little causes can have big effects, and that changes can happen not in a gradual linear way but dramatically at a moment when the system switches' (Urry, 2004: 33). While big interventions may fail, small changes can have great effect.

While this makes policy interventions unpredictable, it also gives small-scale interventions a new importance. Most significantly, this can be seen in the 'safety in numbers' phenomenon (Jacobsen, 2003). Jacobsen's work shows that a person walking or bicycling is less likely to be hit by a motorist the more people walk or cycle, because motorists adapt the way they drive to the presence of pedestrians and cyclists. Jacobsen concludes that 'policies that increase the numbers of people walking and bicycling appear to be an effective route to improving the safety of people walking and bicycling' (2003: 208). Similarly, Vandenbulcke et al. confirm the significance of small-scale interventions through the observation that 'high rates of bicycle use in one municipality stimulate cycling in neighbouring municipalities, and hence […] a mass effect can be initiated, i.e. more cycle commuting encourages even more commuters in the area to cycle' (2011: 118). An intervention which increases cycling rates in one location can, therefore, contribute to the emergence of the practice beyond the boundaries of the intervention.

Aldred argues that personal support between friends and colleagues plays a significant role in the promotion of cycling (2012: 27). Her research shows that friends provided support in various ways: by lending or passing on second hand bicycles, panniers or clothing, by advising on routes or on purchases, or by helping with repairs. This small-scale informal provision of support between cyclists may, therefore, be a significant contribution to a systemic transition.

3.4.2 Considering the socio-technical system of urban mobility

Facilitating transport cycling needs to consider the system of practices in which current mobility practices are embedded, which holds driving in place and marginalises other mobility practices. As shown above, cycling and driving compete for space and carriers. Facilitating urban transport cycling, therefore, needs to change the relation between cycling and driving by actively restricting driving. Several approaches have been suggested in the literature: reducing traffic speed and restricting car access in residential areas (Pooley et al., 2013), giving priority to pedestrians and cyclists (Schepel, 2009), restricting car parking, e.g. unbundling parking from housing and locating parking at the periphery of residential areas (Broaddus, 2010). In city centres, congestion charges have significantly reduced car travel and increased cycling and walking (Pooley et al., 2013). The design of the infrastructure can prioritise cycling over driving (Daley and Rissel, 2011; Pucher and Dijkstra, 2003) and communicate a road user hierarchy where non-motorised modes are at the top (Davis, 2007).

Furthermore, facilitating cycling does not only require a focus on the competition with driving, but should also take into account co-dependent practices of cycling. Mobility practices form bundles with a variety of other practices, such as showering, dressing, grocery shopping, visiting family etc. Facilitating cycling is therefore not only about providing infrastructure specific to cycling, but also about making it possible to integrate cycling with all these other practices. For example, the combination of technologies such as the freezer, the car and the microwave with the socio-temporal demands of daily routine have produced the practice of bulk-buying (see Shove and Southerton, 2000). A substitution of the car by the bicycle requires a change in the practice of grocery shopping to smaller quantities, which in turn means that smaller package sizes should be available and promotional offers should not predominantly be based on the purchase of greater quantities.

At the city level, facilitating transport cycling requires a rethinking of urban land-use patterns. Automobility has become the predominant global form of mobility (Sheller and Urry, 2000). Through the changes produced by automobility, principally the normalisation of longer travel distances, '[s]ocial life more generally [is] irreversibly locked in to the mode of mobility that automobility generates and presupposes' (Urry, 2004: 27). A substitution of the car by the bicycle requires the shortening of daily journey distances, e.g. through the decentralisation of services, employment opportunities, education facilities etc.

Finally, facilitating cycling should consider the context in which interventions are planned and implemented. Sheller and Urry argue that the system of automobility goes far beyond mere driving, but is '[t]he dominant culture that sustains major discourses of what constitutes the good life' (2000: 739). In chapter 2, I reviewed the Social Construction of Technology approach (Pinch and Bijker, 1984) which shows the conflicts and negotiations involved in the development of technologies and argues that 'technological frames' significantly shape the imaginations and visions for new technologies. Automobility may therefore limit the imagination of urban planners in terms of the potential of cycling as serious mobility alternative for the city.

3.5 Conclusion

This chapter has shown several inherent conflicts of the practice of cycling. First, the community of practice is divided as to the appropriate performance of the practice. Cyclists adapt their performances according to situational and infrastructural circumstances as well as in response to rules established in certain subcommunities, such as the bicycle messenger community. The differences in performance shape the bodily and the emotional experience of cycling in different ways and therefore exacerbate the divisions in the community.

Second, cycling and especially the risks associated with cycling are perceived differently between cyclists and non-cyclists. With the normalisation of driving, cycling has increasingly been portrayed as strange and dangerous. Fears associated with cycling constitute a significant (socially constructed) barrier to cycling, even though these fears generally decrease with growing cycling experience. Because of this general image of cycling as a risky practice, cyclists are often portrayed as reckless and even cyclists appear to feel the need to distance themselves from that image and thereby from other cyclists.

Third, cycling competes with driving. With the normalisation of driving and the emergence of the system of automobility, other mobility practices including cycling have been marginalised in terms of carriers as well as public space. Industries, systems of provision, discourses and land-use patterns are part of the system of automobility and contribute to reproducing the system and its key practice of driving.

Facilitating cycling requires rethinking the conventional approaches to the promotion of cycling, cycling campaigns and the provision of segregated cycle paths. The practice

approach and systems theory argue that practices are embedded in socio-technical systems and that interventions emerge from the system and take effect as part thereof. This underlines the importance of small-scale interventions and of the relations between competing and co-dependent practices. It also draws attention to systems of practice, especially the system of automobility which holds driving in place, and suggests that planning and designing interventions to facilitate cycling might be difficult in the context of a system of practice which celebrates driving.

Chapter 4: Methodology

The last two chapters have positioned this research by critically reviewing the relevant literature, identifying weaknesses in the theoretical approaches and outlining potentially fruitful combinations of bodies of literature, which will form the basis for this research. This chapter will translate the research aim and questions into a feasible research project. The first part of this chapter will, therefore, return to the research aim and questions presented in the introduction and on the basis of the literature reviews develop the research objectives which will guide this work.

The second part of this chapter will present the research approach, including a short outline of the philosophical foundation of the research and a justification of the case study method. This research is based on a social constructivist research paradigm and draws on the methodology of naturalistic inquiry (see Erlandson et al., 1993) and grounded theory (Glaser and Strauss, 1967), and thereby follows an inductive research strategy and an iterative research process, which is characterised by constant adaptation of the research focus and the research methods in response to new data and analysis. The research will follow a case study approach to generate qualitative empirical data through multiple methods. While this research aims to contribute to the practice theory debate on policy interventions, it is not intended as a how-to guide and policy recommendations will be limited due to the situatedness of the knowledge produced in this research project.

The third part of this chapter will focus on the research methods used to generate empirical data in the field. This research combines semi-structured interviews with participant observation, photography and document analysis in order to build an understanding of the practice and explore approaches to facilitating it. While semi-structured interviews provide the main source of data for this research, observations, informal conversations, and personal experience through the performance of the practice provide additional data as well as guidance for interpretation. Document analysis was used mainly to contextualise and clarify interview statements and observations. Finally, photography was used to document experiences, doubts and questions encountered during the participant observation. The combination of the four methods opened up various perspectives on the practice and allowed a careful triangulation of the data.

The fourth part of this chapter will reflect on the challenges of the actual fieldwork. It will first describe the research process in the field and reflect on the challenges and the

adaptations of the methods. The research evolved in an iterative manner as the study adapted continually to new insights from the fieldwork. The main adaptation was the broadening of the participant observation to include participation in civil society activities to promote cycling because these activities seemed to be as relevant as the provision of infrastructure, which had initially been the exclusive focus. Furthermore, this part of the chapter will reflect on the impact of my presence on the data. While my presence and the research as such had an effect on the data, I here identify and discuss three characteristics of myself, namely being European, being a cyclist and being a female researcher, which produced specific challenges in terms of access to data as well as data generation.

The fifth part of this chapter will reflect on the data analysis and writing. I will justify the decision to pursue the audio-coding of the interviews instead of the more conventional route of transcription and text-based coding. This allowed to preserve the natural form of the interview data throughout the coding process. This decision required the use of specialised software, which additionally helped to organise the data as well as generate conclusions. Finally, I will portray the whole process of data analysis as an iterative process, including not only the coding of the data, the interpretation of the data and the writing, but also several instances of revisiting the literature.

The final part will reflect on three limitations of the research project. First, it will argue that although necessary in order to achieve the desired depth of the data, the ethnographic approach is obviously limited, first because the researcher can only be in one location at once and because it is very time consuming. Second, this study is a snapshot of a situation in 2011. However, in accordance with the research paradigm, realities are constantly evolving and so are practices. Therefore, a longitudinal study would enrich the conclusions, especially as to the success and failure of different approaches to facilitating practices. Finally, the limited scope of the project required a selection of cycleways for closer analysis. While the selection could be justified and produced rich data, a different selection may have produced different insights.

4.1   Research aims, questions and objectives

This research aims to achieve a better understanding of interventions in the trajectory of a practice and to contribute to practice theory and current debates on interventions in the trajectories of practices. As presented in the introduction, these two aims can be translated into the following research questions:

1) What is transport cycling in Santiago?
2) What kind of interventions in the trajectory of transport cycling can be observed in Santiago and how do these interventions take effect?
3) How are interventions developed, planned and designed?
4) What can the case of transport cycling in Santiago contribute to the conceptualisation of practices and current debates on interventions in the trajectory of a practice?

In order to answer the research questions, this research included the following four objectives: first, achieving an in-depth empirical understanding of urban transport cycling in Santiago, including its recent history and the city as socio-technical system in which the practice is embedded (chapter 5); second, exploring approaches to facilitating the practice, including infrastructure interventions as well as civil society activities, focusing on how they are developed as well as how they take effect (chapters 6 and 7); third, contributing to the body of practice theories by exploring the possibilities of productively combining practice theories and approaches from Science and Technology Studies in the analysis of practice trajectories and interventions (chapter 8); and, finally, making tentative policy recommendations with regard to facilitating a contested practice such as urban transport cycling in Santiago (chapter 9).

4.2   Research approach

This part of the chapter will first develop the theoretical basis of the research as well as the research strategy. The first part will include a short discussion of the underlying social constructivist research paradigm and the questions of what and how knowledge can be produced on practices as emerging social phenomena which are only partly visible and constantly in flux. I engage with Law's (2004) suggestion that a different kind of knowing might be required in order to study the complexity and messiness of cities, practices and interventions in these. I conclude by outlining a methodology inspired by naturalistic inquiry and grounded theory and based on multiple methods, which will include different kinds of knowing. The second section will outline the case study approach, justify the decision in favour of a single case and describe the selection process for the case study and the nested cases, which were mainly guided by purposive sampling (Erlandson et al., 1993) and Flyvbjerg's (2006) paradigmatic case.

4.2.1 Research paradigm

This research adheres to the social constructivist research paradigm, which assumes the existence of multiple constructed, but fluid realities, 'socially and experientially based, local and specific in nature' (Guba and Lincoln, 1994: 110). This ontological relativism as opposed to realist research paradigms seemed the most conducive to studying the different experiences and understandings of practices.

Studying practices is a complex undertaking. While there are well-established research designs for studying 'behaviour' in psychology and behavioural economics, according to Harvey et al. 'there is no comparably well-defined package of research designs and no ready-made repertoire of methodological tools ready and waiting for the practice-based researcher to pick up and deploy' (2012: 3). Although practices are argued to be public and visible and 'manifest in what members do' (Barnes, 2001: 17), practices are emergent processes, constantly in flux, locally embedded with unclear boundaries. Furthermore, while the doings and sayings are visible actions, practices are not necessarily visible as they endure between performances (Shove, Pantzar and Watson, 2012: 7). Additionally, the city with its infrastructure, people, organisations and its everyday public life, which are also in constant flux, are part of the practice. Law asks: 'If much of the world is vague, diffuse or unspecific, slippery, emotional, ephemeral, elusive or indistinct, changes like a kaleidoscope, or doesn't really have much of a pattern at all, then where does this leave social science?' (2004: 1) Pickering concludes that studying practices cannot focus on searching for a 'behind-the-scenes structure'. The emergent nature of practices deny any predictability and therefore '[a]ll that one can do is register the visible and specific intertwinings of the human and the nonhuman' (2001: 167).

Law is not satisfied with this rather reductive outlook on social science and suggests 'if we want to think about the messes of reality at all then we're going to have to teach ourselves to think, to practise, to relate, and to know in new ways.' (2004: 1) Law suggests several potential new ways of gaining knowledge, such as knowing as embodiment through sensual experiences, discomforts or pains of our bodies, or knowing as emotionality or apprehension through experiencing the 'worlds of sensibilities, passions, intuitions, fears and betrayals' (ibid.: 1-2). Researching practices, therefore, requires a careful rethinking of the research approach as well as the research methods. By including my own participation in the practice as research method, I added an element of knowing as embodiment (and

pain) as well as knowing as emotionality through the experience of cycling. I will return to this discussion in part 3 of this chapter.

This research project was understood as a cooperative effort with the research participants, with my bicycle and with the city to generate rich empirical data through multiple research methods (which will be discussed below). The methodology of this research is mainly inspired by *Doing Naturalistic Inquiry* (Erlandson et al., 1993) and follows a grounded theory approach (Glaser and Strauss, 1967), in that it starts from thick description (Geertz, 1973) of the observed and moves in an inductive, iterative process towards the building of theory.

4.2.2   Case study approach

Based on Flyvbjerg (2006) and Yin (2009: 5-13), in view of the exploratory nature of the research, the aim to contribute to theory-building, and the need to study practices as locally embedded social phenomena, this research will adopt a case study approach. The next three sections will justify the decision for a single case study, the case study selection process and the selection of nested case studies.

4.2.2.1   A single case

This research is based on a single case, namely the practice of urban transport cycling in Santiago de Chile. A single case allowed the in-depth study of the practice in its local setting and the combination of multiple methods of data generation in the time frame of a PhD research project.

A common critique of the single case study points to the uniqueness of the case and the resulting difficulty of making general claims on that basis. Yin argues in favour of multiple-case designs as opposed to single-case designs as '[a]nalytic conclusions independently arising from two cases, as with two experiments, will be more powerful than those coming from a single case (or single experiment) alone' (2009: 61). This concern originates in the conventional concepts of quality in positivist research, internal validity, generalisability, reliability and objectivity, and their underlying ontology and epistemology (see Guba and Lincoln, 1994). However, Flyvbjerg argues that often the extreme or atypical cases, which would be eliminated in statistical analysis, reveal more information and that 'it is often more important to clarify the deeper causes behind a given problem and its consequences than to describe the symptoms of the problem and how frequently they occur' (2006: 229).

Following the research philosophy of naturalistic inquiry, I indeed do not regard a simple generalisation from this research as possible (Erlandson et al., 1993: 32). However, single case studies have been shown to be relevant contributions to knowledge (see a presentation of several famous single cases studies in Yin, 2009: 6-7). Flyvbjerg argues that 'formal generalization is only one of many ways by which people gain and accumulate knowledge. That knowledge cannot be formally generalized does not mean that it cannot enter into the collective process of knowledge accumulation in a given field or in a society' (2006: 227). Additionally, Erlandson et al. argue that knowledge gained from one context can be relevant to another in that the thick description of the single case can build the foundation for working hypotheses in other contexts (1993: 32-33). While the responsibility for assessing transferability of research results lies with the receiving context (ibid.), the naturalistic researcher is responsible for providing as much detail as possible in its description of the case and for being transparent in the analysis.

4.2.2.2   Selection criteria and process

In view of the exploratory nature of the research and the decision in favour of an in-depth study of a single case, the selection of the case study was guided by the practice of *purposive sampling*, which aims at selecting cases that provide rich detail about the subject of enquiry (Erlandson et al., 1993: 33).

The selection strategy included first the definition of certain criteria; second, the decision to focus on South America; third, a literature review of interesting cases and an internet search via sites of civil society organisations; fourth, contacting civil society organisations, urban planning experts (consultants or academics) in Colombia, Peru, Argentina and Chile in order to ask for suggestions of potential case studies and later to discuss potential cases.

Practices are ubiquitous and so are government initiatives aimed at changing what we do. Therefore, in order to limit my search for the case study I defined the following selection criteria, based on the research objectives, the emerging insights from the literature review, practicalities, and my personal interests. I searched for a *public* programme to promote a certain practice, with the requirement that the programme was supported by the provision of *infrastructure*. On the basis of my personal interest as well as my personal experience, I focused my search on *urban* interventions aimed at enhancing *environmental sustainability*. The focus on the urban was also justified through the practicalities of access and mobility in the city. The last criterion was *commitment*. While most types of

infrastructure require some behavioural response, there are some types of infrastructure that require day-to-day active commitment from its users. I limited the search to social practices that are perceived as tedious or exhausting if the circumstances are not conducive and to which there are clear alternatives. Focusing on infrastructures that facilitate this type of social practices is useful, because the risk of people defecting from the practice is high.

The second step in the case study selection was my decision to focus the search on South American cities. Because of the rapid pace of urbanisation in cities in the Global South compared to the urban growth experienced in industrialised countries (Henderson, 2002: 89-90) and years of insufficient investments many cities face a lack of urban infrastructure. Additionally, the involvement of international development organisations made it more probable to find projects aimed at changing practices via the provision of infrastructure and added complexity based on the different backgrounds, knowledge bases and understandings of proposed interventions. The decision to focus on South America was partly based on my own professional experience in development cooperation in this region. Additionally, in Latin America urban growth rates were extreme in the 1960s and 70s and have since then somewhat stabilised in many cities. This has allowed for a shift in focus from the provision of basic services towards sectors such as transport and solid waste management, which seemed closer to the criteria defined above.

The literature review led to a list of cases, including in Brazil a public transport intervention in Curitiba (Moore, 2007) and integrated urban environmental management in Porto Alegre (Menegat, 2002); in Colombia the metropolitan railway in Medellín (Stienen, 2009), the Bus Rapid Transit system Transmilenio in Bogotá (Valderrama and Jørgensen, 2008), interventions aimed at increasing walking and cycling in Bogotá (Cervero et al., 2009) and waste management in Bogotá; in Argentina smart technology in public transport in Rosario and household waste recycling in Buenos Aires; in Peru urban environmental management in Ilo (Balvín Díaz, López Follegatti and Hordijk, 1996); and in Chile reconstruction work in Concepción after the Tsunami and the promotion of cycling in Santiago (Ortúzar, Iacobelli and Valeze, 2000). Brazil was excluded on language grounds as in view of the in-depth qualitative research approach, I considered it important to be able to speak the local language.

Finally, I contacted various NGOs and experts in the urban planning field (consultants and academics) in Colombia, Peru, Argentina and Chile. The long list of projects that appeared suitable was then scrutinised as to two criteria:

1. Richness

I took into account whether the case consisted of a single intervention or multiple interventions as the latter would potentially provide more data and especially more varied data. Furthermore, I took into account the number of actors. More actors would potentially provide a more nuanced picture through the multiple perspectives that I could explore with the research participants. Finally, I searched for cases with public participation in the planning and design of interventions because the integration of different types of knowledge (expert knowledge and local knowledge) could add complexity to the case study.

2. Access

I considered the location of the performance of the practice. Performances in private households, as for example in the case of recycling household waste, would be more difficult to observe than performances in the public space, as for example in the case of urban transport cycling. Furthermore, I took into account how many contacts I had established so far and whether they seemed open to help me to start networking with potential research participants.

The case of urban transport cycling in Santiago was by far the richest case with various infrastructure interventions, activities and events happening at the time, three levels of government all involved in the planning and design of urban infrastructure, at the local level 37 independent municipalities in Greater Santiago, and several active and critical civil society organisations. Furthermore, it seemed useful that cycling was a practice that was performed in the public space with visible public infrastructure. This made it easy to participate and observe. Finally, the civil society organisations had been very forthcoming on first contact (and remained extremely helpful throughout the fieldwork).

4.2.2.3 Nested cases

In order to achieve the necessary depth in the data despite the dimensions of my case study in terms of area and members of the community of practice, I decided to study selected cycleways as well as civil society organisations and their activities in more detail.

Similarly to the selection of urban transport cycling in Santiago as case study for this research, the selection of the cycleways and organisations followed a purposive sampling strategy and the concept of the paradigmatic case (see above). The selected cycleway cases all required explanation of the planning and design outcome and thereby had the potential to contribute valuable insights with regard to the research questions on the genesis and the effect of infrastructure interventions. The individual case studies will be presented in detail in chapter 6.

While I was visiting the cycling organisations in order to meet potential interviewees, I realised that the targeted support which they provided to potential new cyclists might be as relevant as infrastructure for the question of how to facilitate cycling. I therefore decided to regularly accompany two organisations in their activities. I selected *Recicleta* and the Women's Cycling School by *Macleta*. Both of these initiatives provide direct practical support to cyclists, one by providing bicycles and the other by teaching women how to ride. Additionally, I was later able to establish a good relationship with the student cycle initiative *Pedalea!Beauchef* at the University of Chile. However, as there were no scheduled activities and the workshop provided constant support to whomever dropped in, I visited rather flexibly whenever I had a spare moment. While I managed to participate almost fully in Recicleta, I mostly observed and only helped out once in a while at the Women's Cycling School and was a complete observer at the university bicycle workshop.

4.3   Methods of data generation

This part of the chapter will present and justify each method of data generation and then reflect on the specific combination of methods. Erlandson et al. argue that the naturalistic researcher should gather data from a variety of sources and in a variety of ways in order to enhance the flow of meaning (1993: 81). Naturalistic inquiry thereby imitates the intuitive approach to solving problems in everyday life, which is adapted with every new piece of information we learn (ibid.: 39). Before the fieldwork, I therefore selected several methods of data generation which would give me a wide variety of data and allow triangulation of the data (ibid.: 138). These methods included interviews, participant observation, photography and document analysis, which will be addressed in turn in the following sections.

In view of the explorative nature of the research and in line with naturalistic inquiry, I initially planned the data generation with some flexibility for the revision and adaptation of

the methods on the basis of preliminary fieldwork results. This will be addressed in part 4 of this chapter. While this part of the chapter does not reflect on the data analysis and the writing (see part 5), it is important to note that analysis and interpretation happened simultaneously during the fieldwork.

4.3.1 Semi-structured interviews

Semi-structured interviews were the main source of data for this research. I conducted 43 semi-structured interviews, of which 41 were audio-recorded and the remaining two were summarised in written form after the interview. Rather than aiming for a representative sample, the sampling of the interviewees aimed to include the richest possible variety of perspectives with regard to the research questions. I therefore interviewed members of cycling organisations, beneficiaries of activities of cycling organisations, Government officials from the local, regional and national level involved in the planning and design of cycling infrastructure, and some further individuals with a particular relationship to the practice. The sampling mainly followed a snowballing procedure until saturation was reached.

In order to understand the practice (research question 1), I first contacted cycling organisations, movements and groups (hereinafter generally referred to as cycling organisations). Through these first interviews, I gained an insight into the recent history of cycling in Santiago, into the difficulties of participating in the practice, and into some activities which the cycling organisations had developed in order to help (potential) cyclists to overcome those difficulties.

In view of my focus on interventions in the trajectory of urban transport cycling (research questions 2 and 3), I also obtained a critical perspective on existing cycling infrastructure and current infrastructure planning. The disagreements between cycling organisations with regard to the need for infrastructure and the possibility of cooperation with the Government quickly became apparent. I therefore interviewed one member of every organisation that had been significantly involved in infrastructure planning. I mainly identified the cycling organisations through a snowballing procedure and later verified the sample through the interviews with Government officials as well as documentation from meetings between cycling organisations and Government.

In the course of the interviews with cycling organisations, I developed a focus on their activities to facilitate cycling, the approach which I will later label 'growing practice'. This

led to further interviews with smaller cycling initiatives and groups which were not involved in the politics of cycleway provision, but directly provided support to (potential) cyclists.

This new focus inspired me to approach people who had participated in civil society activities or benefitted from these activities in order to explore how these activities had taken effect. By that time, I was following three cycling organisations as a participant observer (see next section) and obtained access to the interviewees through these organisations. While most of the members of cycling organisations were experienced cyclists and well-connected in the community of practice, these interviews gave me an insight into the reality of beginner cyclists, cyclists at the (non-organised) periphery of the community of practice and the process of integration into the community. Here, I aimed to sample a group of interviewees as diverse as possible in terms of gender, age, class, cycling competence and the way they had participated in or benefitted from the cycling organisations' activities. The small number of interviewees cannot be representative of all urban transport cyclists in Santiago, but their individual accounts were an invaluable resource for my understanding of the effect of the 'growing practice' interventions.

Through the more politically involved organisations, I obtained contacts to the government officials involved in the planning and design of cycling infrastructure. The interviews at the regional and national level followed a snowballing procedure until I had interviewed one representative of each government body which had a significant role in the planning and design of urban cycleways and saturation was reached in the form that no new names or government bodies were mentioned in interviews. Two instances of political negotiation seemed particularly relevant for the provision of cycling infrastructure (see section 6.3.3) and therefore I also interviewed several former government officials who had been involved in these negotiations.

During the first interviews, I asked the interviewees for recommendations as to interesting case study cycleways and subsequently selected four cycleways which covered six municipalities. I interviewed at least one member of each of the six planning secretariats in the respective municipalities. The interviews at the planning secretariats gave me an insight as to the challenges of infrastructure planning at the local level, the administrative procedures, the funding mechanisms, the required documentation and evaluations. I also learnt about the urban planning system and respective regulations and thereby identified further interviewees at the regional and national level and could validate my sample of government officials. Additionally, I was able to carry out two interviews with the architects

who had designed two of the cycleway case studies. These two interviews gave me a more in-depth insight into the actual design process.

Finally, in order to follow up on particular aspects of the practice, I carried out further interviews which were focused on particular aspects of the practice, for example the private sector role, the public bicycle scheme in Providencia, traffic regulation and enforcement and cycling safety campaigns.

In summary, the interviewees belonged to the following groups:

- 12 interviews with representatives of the main cycling organisations, groups and movements and some more localised or specialised initiatives;
- 9 interviews with 11 former or current members of the most relevant government bodies in the planning and design of cycleways at national and regional level;
- 8 interviews with 9 members of the six case study municipalities;
- 8 interviews with people who had benefitted from or participated in the activities of the case study cycling organisations;
- 6 further interviews with an academic expert, a member of administration of a university who had initiated a cycling safety campaign, a police officer specialised in traffic education, two representatives of bicycle businesses, a member of an architectural firm involved in the design of a cycleway case study.

Socio-demographic data of the interviewees is provided in Annex 1.

I chose to use qualitative interviewing as a research method for three reasons: my interest in understandings, views and experiences; gaining access to data which would not be available in any other form; and giving my research participants the opportunity to express their views and raise issues that were relevant to them.

Mason argues that qualitative interviewing may be chosen because the ontological position of the researcher suggests that 'people's knowledge, views, understandings, interpretations, experiences, and interactions are meaningful properties of the social reality which [the] research questions are designed to explore' (2002: 63). Exploring the contested practice of cycling, required gaining access to the different understandings, the ways cyclists negotiated rules, their opinions on cycleways, their experiences of cycling in urban traffic etc. Also, the interviews with government officials included exploring the beliefs regarding the role of cycling in the urban transport system. Interviewing the research participants allowed me to explore these questions together with the research participants.

Furthermore, I used interviews to gain access to data which I could not have accessed in any other way. For example, I could have studied the Chilean planning system through the laws and regulations, but in that way I would not have gained knowledge of the everyday reality of the local planning secretariats, including the challenges of the individual municipalities, the informal cooperation between municipalities as well as the competitions and conflicts between government bodies. Similarly, I learnt most of the recent history of cycling through interviews.

Finally, in view of the dominance of European and North American research (see chapter 3), interviews seemed an appropriate method to literally give a voice to my research participants, not only to give them the opportunity to express their views in response to my questions, but also to bring up issues that were relevant to them. This was especially relevant in view of the combination with participant observation (see next section). According to Hammersley and Atkinson, the ethnographic approach risks claiming 'the authority to speak unequivocally of and for the people in question' (1995: 253). They argue that participant observation recorded in personal field notes by the researcher, may reproduce a dominant voice of Northern research traditions and silence the voices of the researched (ibid.: 253-254). For this reason, the many interview quotes in the empirical chapters intend to give a voice to my research participants in this thesis.

My interview technique was similar to the model of responsive interviewing which 'emphasizes the importance of building a relationship of trust between the interviewer and the interviewee that leads to more give-and-take in the conversation. [...] The pattern of questioning is flexible; questions evolve in response to what the interviewees have just said, and new questions are designed to tap the experience and knowledge of each interviewee' (Rubin and Rubin, 2012: 36). I adapted the interview style to the interviewees, especially in the degree of formality and in the language (see Erlandson et al., 1993: 87-88). While I had always prepared a set of topics and questions before the interview, I generally started with a very broad question, allowing the interviewees to articulate the issues they considered relevant for me to know. Then I adapted the order of the topics to the flow of the conversation. This responsive strategy had three advantages: first, I was able to verify the relevance of my research questions in the local context and the accuracy of my preliminary findings, especially when interviewees mentioned certain issues without any prompt; second, this technique also brought up new aspects which challenged my thinking and led to the adaptation of my focus and my questions in subsequent interviews; and

thirdly, taking seriously the concerns of the interviewees contributed to building rapport and creating a conducive atmosphere in which interviewees felt comfortable to express their views.

The interviews will be quoted throughout the thesis. In order to protect the anonymity of the research participants, the interviews have been numbered. Quotes will provide the interview number and the date of the interview.

4.3.2 Participant observation

O'Reilly (2005) argues that participating and observing are not exclusively elements of ethnographic research, but could also be beneficial to interview-based research. In this sense, I used participant observation as addition to the interviews, constantly learning and developing new tentative concepts and questions. These experiences, concepts and questions fed into the interviews, which added new perspectives, but also validated some observations and produced new questions. This iterative process between doing interviews, observing and participating contributed to an in-depth understanding, acknowledging the multitude of voices and perspectives among the research participants including myself.

One form of participating was to engage in urban transport cycling. Schatzki argues that in order to gain understanding of a practice it is a necessary step to actually participate in the doing (Schatzki, 1996: 93f). It would be simplistic to assume that the simple doing of the practice would give me the same experience as my research participants when they engaged in the practice. Different backgrounds, knowledge, motivations, and understandings of the practice would colour the experience. However, even if I was not able to access the exact same experience, cycling seemed to be like a common language between cyclists. O'Reilly argues that 'learning the language' does not only include the vocabulary but also includes sets of behaviour (2005: 95). In that sense, my cycling in Santiago was similar to a process of learning a language and thereby contributed to gaining access to groups of cyclists, and made it possible to build rapport and share common experiences.

Figure 4-1: Cycling on a beautiful autumn day.
25/05/2011.
Photo courtesy of Gemmina Ramirez.

I bought a bicycle about three weeks into the fieldwork and started cycling. I therefore had the experience of buying a bicycle, and I experienced the problem of lacking knowledge in bicycle mechanics when my bicycle had technical problems. I experienced the situation of needing support with bicycle repair at the beginning when adjustments had to be made and later when a pedal failed. I also upgraded the bicycle with new tyres after a few months and felt the difference of the material arrangement in the performance.

Living in the city offered other transport options, such as taking the metro or a bus, using an individual or collective taxi or walking, and I experienced how I weighed up the advantages and disadvantages of transport options. However, I made a conscious effort to cycle to most destinations in order to gather as much experience as possible. I cycled with people from the cycling organisations and experienced different styles of cycling, defensive or more aggressive cycling. I also cycled in different weather conditions and at night. Most importantly, I experienced cycling in traffic, the dangerous manoeuvres of cars, the feeling of buses overtaking too closely, the aggressive or sexist exclamations of other road users, but also the exhilarating rides downhill at great speed, the satisfaction at being faster by bicycle than by public transport, the contentment of knowing the best routes through the city, the relaxed feeling of cycling through a park, and the feeling of being part of a special

community without knowing all the members. Experiences were recorded in occasional fieldnotes as well as photographs (see next section). All this gave me a good basis for meaningful conversations and interviews with cyclists, the iterative process of data generation and analysis as well as a critical stance as to the neglect of the individual experience in practice theory which will be one theme of this research (see chapter 8).

4.3.3 Photography

Photography was used during the fieldwork for the purpose of documentation (Rose, 2012), during the analysis I used the photographs as visual memory (Collier and Collier, 1986) and in the thesis they serve the purpose of illustration, analysis and argument (Newbury, 2011).

The main purpose of photography during the fieldwork was documentation. I took photographs to document the experiences of the participant observation and to document cycleway designs in order to develop a cycleway typology (see chapter 6). Although photo-documentation is based on the assumption that 'photographs are accurate records of what was in front of the camera when its shutter snapped' (Rose, 2012: 301), it is acknowledged that photography depends on the photographers understanding, values and interpretation of the situation. 'The camera, however automatic, is a tool that is highly sensitive to the attitudes of its operator […] it is a tool of both extreme selectivity and no selectivity at all' (Collier and Collier, 1986: 9). While the photography shows whatever was in front of the camera and provides high descriptive detail, it is the photographer who selected the perspective.

During the analysis and writing stages of this research, the photographs were used as visual memory as well as for triangulation. 'The memory of film replaces the notebook and insures complete quotation under the most trying circumstance' (Collier and Collier, 1986: 9). In view of the difficulty of fully documenting situations in traffic or rather chaotic bicycle repair events verbally, photography proved to be a useful tool for documentation. Apart from the quick capturing of details, photography also had the advantage of allowing repeated viewing during the research process. Collier and Collier argue that photos can be taken to preserve the vivid first impressions of the fieldwork before the 'strange' environment becomes normal (1986: 16) and once taken can then preserve the information for further laboratory study which can occur years later (ibid.: 20). Ball and Smith argue that 'photographs provide the researcher with a documentary record of

appearances that can be repeatedly viewed and scrutinized for features that may escape the unaided ethnographic eye' (2011: 400). Photographs thereby can become a possibility to check on eye memory as well as see new aspects as the analysis progresses. The possibility to view the photographs again during the 15-month writing period contributed significantly to maintaining the memories of the events.

Finally, Pink adds that seeing a photograph is not a solely visual experience. According to Pink, photographs can invoke other sensory experiences and thus viewing a photograph can make a person imagine what the situation in the photograph would feel like (2011: 602). Similarly, I found that viewing the photographs helped me to remember the full sensory experience from the situation when the photograph was taken.

In this thesis, the visual images will serve the three purposes presented by Newbury (2011): illustration, analysis and argument. Illustration refers to instances where images are 'used as an explanatory adjunct to an argument or discussion presented in written form' (ibid.: 654). The argument here could be presented in other ways and does not depend on the specific qualities of the visual image. Analysis occurs where the visual image is the object of study. Analysis draws attention to the composition of the image and its effect and acknowledges that 'what we are looking at is an image, not the thing itself' (ibid.). Finally, argument refers to the use of visual images in order to present an independent argument. Images can be presented with text, and the images convey an argument which may reinforce what is presented in the text, 'the images have autonomy from the textual component' (ibid.: 655). Newbury acknowledges that images 'operate on multiple levels simultaneously, and in the spaces in between' (ibid.) and suggests using these categories to reflect on the use of images.

In this thesis, I mostly use visual images produced by myself[3] during the fieldwork. I used images to illustrate the experience of participant observation, for example in this chapter, in order to enrich the presentation of the argument. While the images here are treated as relatively evident, it is acknowledged that 'images are never entirely transparent in quite the way this suggests' (Newbury, 2011: 654). Furthermore, I used visual images to analyse the repositioning of cycling through the advertisements for the public bicycle scheme in chapter 5. Finally, I used visual images, photography as well as schematic representations,

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[3] Exceptions are three photographs which were taken by the research participants during the time of the fieldwork and in my presence (presented in this chapter) and two advertisements in the form of visual images (described in chapter 5).

as 'argument' (following Newbury's language, see above) to establish a typology of cycleways in chapter 6.

4.3.4   Document analysis

According to Erlandson et al. documents include 'the broad range of written and symbolic records, as well as any available materials and data. Documents include practically anything in existence prior to and during the investigation.' (1993: 99) During the course of the fieldwork, I collected various documents, including maps, cycling manuals, laws, transport and cycling statistics, feasibility and follow-up studies of cycling investments, and a variety of documents from municipalities on general transport planning as well as the planning and design of the specific cycleway case studies, including some original sketches of a cycleway design.

In accordance with Mason, the document analysis was conducted alongside other methods of data generation in order to clarify interviewees' statements or contextualise my own observations (2002: 108). These documents were collected and processed throughout the research in order to build up a more comprehensive understanding and to be able to ask more specific questions.

4.3.5   Reflections on the combination of methods

This research used qualitative interviews, participant observation, photography and document analysis as methods of data generation. While naturalistic inquiry generally requires the use of multiple data sources as well as methods of data generation (Erlandson et al., 1993), this specific combination of methods requires justification.

The principal method of data generation was the conducting of the qualitative interviews. In view of the contested nature of urban transport cycling in Santiago as the focus of this research, I used triangulation of multiple data sources and methods of data generation in order to map the conflicts in which the practice was involved and to verify the credibility of my interpretations (see Erlandson et al., 1993: 115, 138).

The multiple methods of data generation complemented each other. I used participant observation to gain an understanding for the interviews. Erlandson et al. argue that naturalistic inquiry should aim 'to construct reality in ways that are consistent and compatible with the constructions of a setting's inhabitants' (1993: 81). In order to achieve this, the researcher should share the experiences of the local people. This process prepared

me for the interviews. Furthermore, I used participant observation as opportunity to discuss insights gained from the interviews. Wherever possible I verified interview statements through document analysis and generally used several interviews combined with my own observations in order to support claims. Finally, I used photography to document the experience of participant observation so that I could review the photographs when new insights had created a new perspectives, and remember and rethink the meaning of events and situations in the photographs. The combination of the methods therefore supported the inductive, iterative process of this research.

It is important to note that triangulation here does not refer to a process in which one objective and knowable truth is discovered by 'work[ing] out which are the most appropriate triangulation points to measure it by' (Mason, 2002: 190). As the research is based on a social-constructivist ontology and a qualitative research approach, I did not pursue an objective truth, but rather used the combination of data sources and methods of data generation to gain a deep understanding supported by multiple perspectives and different types of data.

4.4   The fieldwork journey

I lived in Santiago from the 20th February to the 31st August 2011 and completed a total of six months fieldwork. The first section of this part of the chapter will focus on the surprises and problems I encountered during the fieldwork and necessary adaptations in the methods. The main adaptation of my methods was the broadening of the participant observation to the activities of selected civil society organisations. The second section will critically reflect on my role as a researcher and the impact of my presence on the data generation. I found three characteristics to significantly shape my position as a researcher in Santiago, being a European researcher, being a cyclist and being a female researcher.

4.4.1   Problems and adaptation of methods and research questions

At first, participating in the activities of the civil society groups was a strategy to get to know people and ask them for contacts and start the snowballing sampling strategy for my interviews. I soon realised, however, that the conversations at these events helped me to develop the sensibility Star (1999) argues is necessary in order to get access to the meanings that cycling has for the people I was going to interview. Therefore, participating in the activities of the pro-cycling groups became an integral part of the research, and the

conversations and observations formed a significant part of the perspective for the interpretation of the data.

Figure 4-2: Participating in a traffic theory class at the Women's Cycling School.
15/05/2011.
Photo courtesy of Viviana Albornoz.

I started following groups on Twitter in order to know about events and got my email address on as many distribution lists as possible. Fortunately, the cycling community quickly started directly forwarding announcements of interesting events to me and inviting me. That way I participated in weekly meetings of one cycling organisation, a complete course at the women's cycling school, many bicycle repair events and workshops, related seminars and talks, networking events, mass cycle rides and cycling demonstrations. I also spent time at a student-led bicycle workshop, followed up with students from the cycling school course and accompanied one student on her search for a bicycle.

Figure 4-3: Cleaning the bottom bracket of a children's bike at a Recicleta repair day.
11/06/2011.
Photo courtesy of Felipe Cuevas.

While it was easy to be an observer at first, the generosity and openness of the research participants, made it increasingly hard not to lose perspective. As O'Reilly puts it nicely: 'It

may be that you have to be at every gathering and every event, and be the last to leave and the first to arrive, to be unobtrusive and yet ask questions, to join in and yet to remain an outsider.' (2005: 97) According to O'Reilly, the tension between the subjectivity of immersion of participation and the critical distance of observation does not have to be resolved. It gives the research method its strength. Nevertheless, being an urban transport cyclist in Santiago and directly experiencing the problems resulting from the badly designed cycling infrastructure and participating in the activities of the cycling organisations, where the conditions for urban transport cycling in Santiago where frequently criticised, invariably made me more critical in my interviews with planners and government officials.

4.4.2   Reflections on the researcher's role

This section will detail three aspects of my role which I found most impacted on the research: being a European researcher, being a cyclist and being a female researcher. I will argue that my European origin and the affiliation with a big British university helped to gain access. However, on rare occasions it caused a certain defensiveness from government officials based on the fear that I would judge the city too harshly in view of my European background. Having been a cyclist all my life and therefore having certain skills gave me self-confidence. Nevertheless, never having cycled in Santiago nor any city of that size gave me the openness to learn from my research participants. Finally, being a female researcher opened and closed doors in view of a practice and a society which are generally male-dominated.

4.4.2.1   Being a European researcher

Generally, my perception was that my European background as well as the affiliation with a British university helped to gain access as well as generated a certain respect. While that was useful in some situations, it could be stifling in others. Some interviewees felt the need to underline the differences in culture between European countries and Chile. This was often used as a general rejection of the idea that cycling could become a significant element of the transport system, unlike in certain European countries where they had a 'cycling culture'. One interviewee from a local government was very defensive from the start, probably expecting me to be critical with regard to the lack of effort to promote cycling in this particular municipality. In this situation, it was difficult to establish a comfortable atmosphere in which any other obstacles to planning or promoting the bicycle apart from the alleged lack of cycling culture may have been discussed. I had to reassure

the interviewee that I was not there to judge and was genuinely interested in the everyday reality of their work.

4.4.2.2 Being a cyclist

Although I had been cycling for over 25 years, my experience of cycling differed drastically from urban transport cycling in Santiago and I was always aware of my automatic comparison with cycling in Hamburg and Berlin. O'Reilly argues that '[i]t is good to be naïve as well as knowledgeable' (2005: 89) because it allows the researcher to be comfortable in the setting and with the language as well as to ask innocent questions. 'Knowing too much can foreclose in-depth conversations; knowing too little can appear rude and uninterested' (ibid.: 90), and those were the two positions I had to balance in every conversation. I learnt to cycle at the age of three or four years, and it was so uneventful that I have only got vague memories. This is in stark contrast to the importance attributed to one's personal story of learning to ride in Santiago (Otero Campos, 2011 and comments).

Although I had actually cycled for much longer than most of my research participants, I seemed to identify less as a cyclist than they did which was a gap I had not foreseen. Cycling had generally been a normal thing to do wherever I was and, therefore, I had not developed an identity as a cyclist. A representative of the Danish embassy in Chile once explained that Danish people generally did not identify as cyclists because that would be like identifying as somebody who regularly cleans their teeth. Cycling in Denmark was considered as normal and everyday as cleaning one's teeth, and you would not identify as a 'regular teeth-cleaner'. The normality of cycling in my life and the resulting lack of an identity as cyclist made me a complete outsider vis-à-vis particular groups of cyclists in Santiago. This was especially notable with more specialised groups, for example the road bike riders whose identity was significantly defined by their bicycles and who would not take seriously a cyclist on a cheap hybrid bike such as mine no matter the urban cycling experience.

4.4.2.3 Being a female researcher

Being a female researcher was a constant issue, which mainly affected access. O'Reilly argues that '[a]ccess is not separate from the research itself. You learn from it about how people view things, what they want you to see and what they do not.' (2005: 90)

I first realised that being a female researcher would significantly affect the research when I wanted to start participating in the bicycle repair sessions of different cycling organisations. I soon realised that I had underestimated how hard this would be. In the beginning, I often had tools actually taken out of my hand with a short 'I will do this for you, shall I?' without this actually being a question. It took a while and considerable effort on my part to learn bicycle mechanics and to gain the self-confidence to insist on actually working with the men. In the meantime, I often just spent time in the workshop watching and learning, which in itself was useful. However, once I had become part of the group, I still experienced awkward moments when my gender was suddenly brought to the forefront again. One example for this was when a male student praised me for cycling and participating in the university bicycle workshop, but concluded that, nevertheless, I could 'glam up' a bit. Whether it was a careless remark or a conscious attempt to put me in my place, I do not know. But it appeared to be a sign that I was somehow breaching gender roles with my participation in the workshop. The relevance of gender discrimination within the community of practice was confirmed in an interview with a female civil society member:

> [M]achismo is huge. This is an extremely discriminatory society and sex is one of the main criteria for discriminating. If you look at the leaderships, the new leaderships that have emerged[4], there has been a disproportionate number of women in the different initiatives, and they have been disproportionately attacked. And usually in very overt and sexual and human and psychological ways, not political ways. This isn't the kind of political debate 'Is it good to have a women's cycling group? Are you segregating women even more?' No, it's 'Oh, those bitches' or those, you know, those 'castrators of the cycling movement' or those, you know, it's like, it's that kind of level. And so that's why there is also, even when women aren't consciously feminist, there is a strong feminist component within cycling. (Interview 28, 18/07/2011)

Being a female researcher was a constant issue, expressed through sexist exclamations of other road users when I was cycling, the denial of technical information on bicycles from sales assistants in bicycle shops, the problems of gaining access – apart from formal interviews, which were always granted – to certain groups of cyclists, or through (subtly) patronising remarks in interviews. In order to minimise the effect of this machismo on the research, I made a considerable effort to be present and visible at as many cycling events and activities of cycling organisations as possible and to become part of the 'scene'. My role as researcher allowed me to keep out of open conflicts and my European origin

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[4] This refers to the leaderships of the cycling organisations that have emerged since 2004 (see chapter 5 for more details).

allowed me to breach gender roles in certain situations, as in my participation in bicycle mechanics. Finally, I also had to swallow and ignore certain comments.

4.5   Data analysis

The research process is conventionally portrayed as a linear process in which the collection of data is followed by the organisation and the analysis of the data. When the analysis and interpretation of the data have been completed, the researcher finally writes up the results. Although the structure of this chapter suggests a similar linear process, in this research data generation, data analysis and writing overlapped considerably during and after the fieldwork. This part of the chapter will focus on the work after the research stay in Santiago. It will first justify the decision to use qualitative data analysis software to organise the data and to audio-code the interviews. It will then focus on the analysis process, which included the coding as well as writing memos and finally writing the thesis.

I analysed my empirical data using a specialised qualitative data analysis software atlas.ti. This decision was primarily based on the sheer amount of mainly digital data, which could be made manageable through the software. Additionally, the software allowed me to code the audio files of the interviews directly instead of transcribing the interviews first.

The use of qualitative data analysis software has been criticised on two related grounds: the fragmentation of the data through the 'code-and-retrieve' mechanism and the loss of closeness to the data (Lee and Esterhuizen, 2000). The fragmentation of the data through retrieving all quotes of a certain code out of their context was especially relevant for those interviews in which interviewees went further afield in their responses and then returned to the original question. In order to avoid fragmentation, I generally coded longer passages in order to preserve context (see Becker and Geer's concepts of inclusive coding and coding by incident (1960: 281)).

With regard to the question of closeness of the data, my experience was that on the contrary the computer software allowed me to stay closer to the data and improved my grasp of the data because the software allowed me to pass through the data repeatedly, which coincides with the findings of Fielding and Lee (1998). The software also supported the production of memos during the coding and the linking of memos, codes and quotes, which significantly contributed to the generation of conclusions.

Gibson et al. (2005) present audio-coding as a potential solution to the reliance on transcription and therefore 'denaturalised' data as opposed to the direct analysis of natural data. While there are various ways to produce meaningful transcripts, transcription remains a representation of natural data and constructs which reflect the researcher's assumptions. These concerns became significant when I started transcribing and realised that I could not do the interviews justice by silencing them into a text form. I therefore switched to coding the audio files directly.

Several concerns have been brought forward as to audio coding. While Gibson et al. (2005) still criticise the audio interface in atlas.ti, the new version of the software shows significant improvements in the visualisation of the coded interview and therefore allows an overview similar to text documents. Furthermore, through the lack of a textual basis, textual search functions cannot be used which presents a significant disadvantage. For example, when a code is established later in the coding process, the question is whether previously coded primary documents may include this new code. An easy way to go through the interviews that have already been coded, would be to search for the name of the code and related key words. This is obviously not possible in audio files. However, as audio-coding helps to stay very close to the data, this is compensated by a better memory of the interviews.

Nevertheless, as the main output of this research is a written thesis, quotes finally had to be transcribed and translated and thereby lost much of their character. However, this was very late in the process and was done in a separate software so that the on-going analysis could still be continued with the natural data. In conclusion, the advantages of audio coding far outweighed the disadvantages. The evocative character of the interviews, the sound of the voices as well as the background sounds, allowed me to remain close to the experiences in the field throughout the analysis and writing (see Fielding and Lee, 1998: 74).

The coding process was guided by the procedure of open coding developed by Glaser and Strauss (1967). I used descriptive codes for every interview. As the analysis progressed, I added more conceptual codes (Lee and Esterhuizen, 2000). Throughout the coding process I wrote memos, thereby linking specific codes and particular quotes. In total, the analysis amounted to 437 codes and 2526 quotes. Throughout the process codes were often renamed, the definitions were refined, codes were merged or split according to the usefulness of distinctions in the analysis.

During the course of the research, several theoretical concepts guided the research. Each of the concepts provided direction to the research until they became limiting and had to be abandoned. While the concepts stayed in my mind, I had to open up to the data again and look at what the data was telling me with a fresh pair of eyes. Coding and stepping back to see the broader picture were alternating phases in the analysis of the data which started during the fieldwork and lasted far into the writing process.

Writing is conventionally seen as a stage after the analysis when the truth has been extracted from the data and is ready to be put on paper. This representation is misleading in two ways. Firstly, in this research writing was an integral part of the analysis, which regularly required returning to the data, reviewing codes and making new associations. It was therefore part of the iterative process which has characterised this whole research in accordance with the grounded theory approach. Secondly, while writing produces a story, it is only one of many that can be told from the data. As Hammersley and Atkinson point out: 'Given the reflexivity of social inquiry, it is vital to recognize that ethnographers construct the accounts of the social world to be found in ethnographic texts, rather than those accounts simply mirroring reality.' (1995: 239) Writing is an integral part of the construction of a social reality represented through text.

4.6   Limitations of the research

This part of the chapter will discuss three limitations of the research methodology: firstly, the limitations of participant observation for practice research in an urban context; secondly, the limitations of a snapshot in the development of a practice; and thirdly, the limitations of the case study selection.

First, using participant observation has inherent limits of scale. 'The labor-intensive and analysis-intensive craft of qualitative research, combined with a historical emphasis on single investigator studies, has never lent itself to ethnography of thousands' (Star, 1999: 383). Harvey et al. add that '[e]thnographic methods may be a useful way in to practices, but they may restrict observations to particular times and locations, limiting their grasp on the duration and spatial scale of many practices' (2012: 9). Using participant observation to research urban transport cycling in Greater Santiago with its six million inhabitants, three involved levels of government, 37 municipalities and various cycling organisations was indeed a challenge and it was difficult to keep up with all the events and activities which were occurring in parallel. I used interviews and document analysis in order to be able to

include data which was independent from my personal presence, and I selected certain cycleways and organisations to be able to achieve a more in-depth understanding. The decision to use participant observation therefore required balancing the broad range of data from the city as socio-technical system and the in-depth understanding of the practice and the individual interventions.

Second, the period of time which I was able to spend in Santiago was limited to six months. Therefore, I was not able to assess the mid- to long-term success (or failure) of the interventions and activities which I witnessed. Instead, I included cycleways which had been built several years ago so that the effect of these infrastructure interventions could be assessed. Similarly, while observing activities of cycling organisations, I additionally included interviews with cyclists who had witnessed activities in the past. Erlandson et al. argue that '[i]nterviews allow the researcher and the respondent to move back and forth in time' (1993: 85). Through the interviews combined with document analysis, I could reconstruct the past to a certain extent and discuss visions and predictions for the future. However, a longitudinal study would be a useful addition in order to follow the effect of different approaches to facilitating cycling.

Finally, in view of the abundance of possible case studies of cycleways, a rather pragmatic selection was necessary. I decided not to focus on the worst cycleways because I feared access to the data would be difficult in municipalities which might be defensive about the negative evaluation of the infrastructure (see reflections on being a European researcher under section 4.4.2.1). For the same reason, I decided not to focus on those municipalities which lacked infrastructure, although this might have provided a valuable additional insight. Instead, I chose cycleways which were generally seen as positive examples by their respective municipalities, but still exhibited problematic design elements or conflicts in the planning process. I then traced the politics and the myths which had shaped the design result (see chapter 6). The strategy to focus on (presumably) positive examples was successful in securing access to data. More importantly, the tension between the positive views and the problematic elements in the design result produced especially rich data as to the planning and design of cycleways.

Chapter 5: Urban transport cycling as contested practice

In order to facilitate a practice, it is essential to know its history, its current composition, its set-up in the material arrangement as well as its relation to other practices. Practices constantly evolve in response to developments in their elements, to changes in the underlying material arrangement and in relation to other practices. This chapter will explore the practice of urban transport cycling in Santiago de Chile in 2011 in order to build a foundation for the analysis of the interventions aimed at facilitating cycling, which will be the focus of the following two chapters. I will first examine the city as socio-technical system in which cycling is embedded (part 1). I will focus particularly on the competition between cycling and driving. I will then trace the milestones in the recent history of cycling (part 2), and finally I will explore the practice itself (part 3). In each of these parts, I will show particular conflicts in which the practice is involved. I will argue that cycling is a contested practice because these conflicts have become an inherent part of the practice in its configuration in 2011.

The first part of this chapter will focus on the city as socio-technical system in which cycling is embedded. Rather than merely the scene of the performance, the city here is understood as a socio-technical system of interrelated practices (see Watson, 2012). This part will particularly focus on the competition between mobility practices, especially between cycling and driving. I will first outline the current urban transport situation in Santiago which is the product of population growth, territorial expansion and rising car ownership which leads to severe traffic congestion at peak times and severe air pollution. I will argue that despite this situation and projections which show that the situation will continue to worsen, the political strategy to alleviate the situation is to facilitate car flow. I will show the prioritisation of the car first in legal and then in spatial/infrastructural terms.

The second part of this chapter will describe the most relevant milestones in the recent history of cycling in Santiago. The selected developments and events reflect the conflicts that make cycling a contested practice in 2011. I will start with the stigmatisation of cycling during the military dictatorship and the role this stigma still holds in 2011. The following sections will focus on the renaissance of the practice after the return to democracy. I will trace the development of the community of practice, which is first divided into a dispersed group of 'traditional cyclists', a term used locally for those cyclists who continued to cycle

mainly out of necessity throughout the military dictatorship and the rise of the car, and a close-knit ideological community, which emerged with the return to democracy. The community of practice becomes more fragmented with the emergence of new cycling organisations during and after an urban transport intervention with international funding in the mid-2000s and with the rapid influx of new cyclists, intensified through the failure of the bus rapid transit scheme Transantiago and the public bicycle scheme in Providencia. Conflicts within this fragmented community of practice become visible in the struggle over the Bicycle Promotion Law proposal in 2009. Simultaneously, efforts are made to reposition the bicycle, end the stigmatisation and create new positive images of cycling. Finally, the rapid increase in cycling generates conflicts over public space. On the sidewalk, cyclists clash with pedestrians, a problem exacerbated through the public bicycle scheme in Providencia. On the carriageway, cyclists are seen as obstacles, which in 2011 leads to the proposal of an amendment to the Traffic Law which aims to remove cyclists from the carriageways. I will argue that these conflicts in the recent history of cycling, i.e. the struggles over the image of cycling, the competition over public space and the dispute over the nature of the joint enterprise of the community of practice, have created an inherently contested practice.

The third part of this chapter will finally turn to urban transport cycling as a practice in Santiago in 2011. I will first focus on the general understanding of cycling in the population because it produces a constant tension, not least in the form of family pressure, which transport cyclists must negotiate. I will then expand on the competing images of cycling which originated in the stigmatisation of the bicycle during the dictatorship and the efforts to reposition the bicycle during the last decade. Furthermore, I will focus on the community of practice. I will expand on the notion of fragmented community of practice and argue that within the community of practice there are diverse groups of practitioners, and I will use accounts of cycling from the interviews to show that cyclists differ in their motivations to cycle. I will then focus on the different performance styles which can be observed in Santiago and examine the way cyclists interpret and negotiate the rules of the practice in their performances. Finally, I fill focus on the disputes with regard to cycling infrastructure as basis for the analysis of infrastructure provision in chapter 6. The chapter will conclude with a summary of the conflicts which have become an inherent part of the contested practice.

5.1 Cycling and driving in the city

This part of the chapter will introduce the city of Greater Santiago and its mobility system. I will focus particularly on the competition and conflicts between urban transport cycling and driving. Santiago's mobility system is principally based on motorised transport, mainly driving private vehicles. I will argue that the city's mobility system marginalises cycling spatially and legally through prioritising motorised transport.

I will begin this part of the chapter with a description of the mobility situation in Santiago in 2011. I will argue that the city is moving towards collapse through the rapid growth of the city in spatial and population terms, the increase in car ownership and mobility needs and thereby also the increase in pollution and traffic congestion, which is projected to worsen further in this decade.

In the second section, I will examine the political priorities in view of the mobility crisis. Although it would appear that the mobility crisis in Santiago would make increasing urban transport cycling a worthwhile policy strategy, the bicycle is not seen as solution. Rather facilitating motorised transport appears to be the main political priority. I will argue that the prioritisation of the car over the bicycle is expressed in the legal system as well as the road infrastructure.

Whilst this section will present existing statistics, it is important to acknowledge that their explanatory power and, therefore, their relevance are limited. Most transport statistics are generated with a focus on individual motorised or collective public transport. Therefore, some specific data on cycling are lacking, and the existing cycling data may show distortions.[5] These shortcomings will be pointed out in the corresponding sections.

5.1.1 Mobility situation and conflicting strategies

Greater Santiago has grown considerably in the last 50 years. Between 1952 and 2002, the urban population increased from 1.4 to 5.8 million inhabitants (Ferrando, 2008; see also GORE, 2006). With an estimated growth rate of 1.4 percent per year, the number of inhabitants is expected to rise to 7 million people by 2015 (GORE, n.d.). This would be more than a third of the Chilean population. While the highest population increase rates of the period between 1940 and 1960 have levelled off, the city is still growing (Ferrando, 2008).

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[5] An example for a distortion is that the morning peak hour of motorised traffic does not coincide with the earlier peak cycling hour, when factory workers travel to the early shift. Countings of cyclists carried out in the general peak hour, therefore, may underestimate the number of cyclists.

Mainly, one can see intercommunal movements from the city centre to the periphery. Some municipalities in the periphery have therefore experienced growth rates up to 50 percent while some central municipalities are experiencing negative growth rates.

Furthermore, Santiago has quadrupled its area in the last 50 years (ibid.). This expansion was mainly motivated by the search for better living conditions and lesser land prices. However, the expansion has led to the loss of agricultural land and affects ecologically vulnerable zones. A report linked to the Greater Santiago land-use plan clearly presents the effect of the spatial expansion of the city:

> This growth would not be problematic if with housing also streets, schools and services were constructed. However, in many cases this has not been so. In various municipalities of Greater Santiago, the urban growth has been more rapid than the capacity of the public and private sectors to provide infrastructure and services. The signals of this imbalance are evident: the traffic congestion has increased and everything indicates that it will continue to increase. Furthermore, the lack of services increases the dependency of the periphery on the metropolitan centre, generating longer and slower journeys. (Ministerio de Vivienda y Urbanismo, 2008: 44, my own translation)

The periphery which is growing rapidly in population has insufficient infrastructure. Furthermore, the lack of services in the periphery produces a centralisation of services in Santiago Centre and adjacent Providencia and the necessity of long journeys. This diagnosis coincides with the Travel Survey which finds that the two central municipalities Santiago Centre and Providencia are by far the most popular travel destination with Santiago receiving 434,040 people and Providencia 198,778 people per day in 2002 (GORE, 2006).

Simultaneously, Santiago has seen a continuous increase in car ownership in the last 35 years. While there were approximately 208,000 cars in Santiago in 1977, this number nearly doubled to 415,000 in 1991 and further increased to 748,000 in 2001. Between 1991 and 2002, Greater Santiago therefore experienced an average annual growth rate of 5.9 percent in the auto fleet (Zegras, 2010). This growing vehicle fleet has completely changed the modal split over the last 35 years with private motorised transport rising from 11.6 percent of trips in 1977 to 37.5 percent in 2006 and public transport decreasing from an overwhelming 83.4 percent to 55.4 percent of trips in the same period (Mideplan-Sectra, 2008: 6-180).

The expansion of the city and the increase in private motorised transport have led to severe traffic congestion, which according to projections by the Ministry of Public Works

will worsen (study quoted in: Ministerio de Vivienda y Urbanismo, 2008: 44-46). Additionally, Santiago experiences high levels of air pollution (Jhun et al., 2013; Zegras, 2010), which is exacerbated due to winter smog. Santiago is situated in the Central Valley, a basin between the Coastal Mountain Range and the Andes. This geography favours the formation of a weather phenomenon called 'thermal inversion', when a warm layer of air acts as a cap over the cold air in the city and hinders the circulation of the air so that the pollutants are trapped on the ground. This phenomenon is particularly frequent in winter (June to September) and causes significant public health problems (see for example Abrutzky et al. (2013) on mortality attributable to atmospheric carbon monoxide (CO) and nitrogen oxides (NOx) in Santiago and Buenos Aires).

Transport cycling has increased in the last decade. Measurements from 2000 and 2001 showed approximately 304,000 daily trips by bicycle which represented 1.9 percent of daily trips in the city, while measurements from 2006 showed that this number had increased to approximately 433,000 trips per day which represented 2.7 percent of daily trips in Santiago (Mideplan-Sectra, 2002; 2008). A more recent counting initiative confirmed this growth: between 2008 and 2012 the number of bicycles on two cycleways in Providencia and Ñuñoa showed an average annual increase of 8.8 percent on work days (UYT S.A., 2012).

However, in an interview with an official of the Regional Government, it was mentioned that the cycling trips were not evenly distributed over the city. While there are 800 cycling trips per day in wealthy Providencia, 20,000 bicycle journeys per day have been recorded in the lower income community El Bosque, although travel distances for the cyclists from El Bosque are usually greater than for those that live in Providencia (Interview 34, 01/08/2011). Indeed, the most recent public travel survey shows that trip lengths differ considerably according to their origin and destination. While overall cycling trips take on average 18 minutes, all trips which start in the Southern Zone and end in the Eastern Zone and vice versa take on average one hour and 14 minutes and one hour and 18 minutes, respectively (Mideplan-Sectra, 2008: 6-61). This significant difference points to the inequality in the city, which requires that some cyclists manage great distances by bicycle out of necessity.

As will be shown in parts 2 and 3 of this chapter, the rising number of cyclists has generated conflicts on the carriageways and sidewalks between drivers, cyclists and

pedestrians and has produced debates over the use of public space. In the next section, I will turn to the political priorities in view of this critical transport situation.

5.1.2 Political priorities in view of the mobility crisis

Despite the situation in the city, cycling is not seen as a solution. As shown above, traffic congestion in Santiago is severe. This has considerably increased travel times and puts pressure on the Government to improve the situation. However, as stated by an official of the Ministry of Housing and Urbanism, the bicycle is not generally viewed as a solution. Rather public transport with the metro and the rapid bus transit system Transantiago, urban expressways and enlargement of urban roads are seen as solution to the traffic congestion problem (Interview 32, 26/07/2011). This contradicts research which shows that providing more infrastructure for motorised transport will increase traffic and exacerbate the situation further (Downs, 1962; Duranton and Turner, 2011).

Reasons for the current prioritisation of motorised transport were manifold. Generally there was a belief that the bicycle was only appropriate for short distances, which excluded the bicycle from the discussions about long commuting distances in view of the expansion of the city and the densification in the periphery. This disregards that most travel actually happens within the six zones of the city defined in the Travel Survey (Mideplan-Sectra, 2002; 2008) and therefore distances of a big proportion of trips are cycleable.

Furthermore, the rising car ownership is simultaneously celebrated as economic progress and as sign of wealth because more individuals can afford a car and because the car represents a significant source of income for the State and the private sector. The car industry, taxes on fuel, fees for the driving license, fees for car registration and license as well as car insurance all depend on rising car ownership and driving. Efforts to limit car use are severely criticised as can be seen in the recent controversy on limiting car parking facilities in Santiago Centre. While the current mayor decided not to further increase car parking facilities, the previous mayor warned that this decision would damage the city centre as economic and financial hub of the city because the main companies would leave as 'executives do not arrive by bicycle' (quoted in Cabello, 2013). In the following two sections, I will show the legal and spatial prioritisation of motorised transport.

5.1.2.1   Legal prioritisation of motorised transport

The prioritisation of car flow over the practice of transport cycling can be seen in three significant changes to the Traffic Law. First, the official speed limit on urban roads was increased. In the original version of the Traffic Law from 1984 the speed limit in urban zones is set at 50km/h (Chile. *Ley de Tránsito 18.290,* 1984: article 150); in 2002 this article is changed and the speed limits for vehicles under 3860kg in urban zones is increased to 60km/h (Chile. *Ley 19.816 Modifica Diversos Cuerpos Legales en Materia de Multas de Transito*, 2002: article 1, d). This new speed limit is still valid today and is severely criticised by many cycling organisations as too high, especially as there is no differentiation between main and residential urban roads.

According to a police officer, two further changes to the Traffic Law occurred in 2005 and concerned the act of overtaking on crossings as well as the right of way of turning cars at crossings (Interview 18, 14/06/2011). While before 2005 it was prohibited to overtake on a crossing, since 2005 overtaking has been permitted on regulated crossings. As to the right of way at crossings, before 2005 a pedestrian who crossed the road had right of way before a turning car. However, after the change in 2005 this rule only remained valid for marked or regulated pedestrian crossings, giving right of way to the turning car on most local roads (Interview 18, 14/06/2011). According to the same police officer, these changes were supposed to speed up vehicle flow.

Furthermore, there is a problematic legal situation for cyclists in the case of an accident. In general, the police tolerates certain breaches of the Traffic Law by cyclists, such as cycling on the sidewalk or cycling on the left side of the carriageway to avoid buses (see section 5.3.4), because it is acknowledged that certain regulations are not appropriate for cycling (Interview 18, 14/06/2011). However, in the case of an accident these breaches of the Traffic Law render the cyclist legally unprotected, and in such a situation accidents are practically automatically considered the cyclist's fault. Several interviewees mentioned cases in which cyclists had received the full responsibility for an accident because they were cycling on the sidewalk or cycling without a helmet, although drivers had been speeding or carrying out dangerous manoeuvres and should have at least shared the responsibility.

5.1.2.2 Spatial prioritisation of motorised transport through road infrastructure

Cycling has to take place 'somewhere' as do driving and walking. Therefore, these different modes of transport compete when space is scarce as is common in cities. Cycling does not necessarily require a cycleway. In Santiago, cycling also takes place in shared spaces, either on the carriageways with cars and buses or on the sidewalk with pedestrians. However, in Santiago there is little trust in shared space. This holds true especially for spaces which are shared by motorised transport and bicycles, but is increasingly valid also for shared space on the sidewalk. In the last 10 years, there has therefore been a surge of specialised cycling infrastructure.

The current state of cycling infrastructure in Santiago shows the prioritisation of the car. Cycling infrastructure is fragmented, mostly badly designed and not well maintained. Despite the Cycle Route Master Plan, which aimed to determine the location of a network of cycleways for the entire city, sudden ends are common, especially at municipal boundaries. This lack of connectivity is not only an issue of comfort, but produces a serious risk for the cyclist. According to an academic expert, an analysis of accidents showed that a cumulation of accidents occurred in the proximity of cycleways (one or two blocks from the end of a cycleway) (Interview 6, 12/04/2011).

Additionally, the network lacks coherence. Cycleways are often constructed where they fit into the existing infrastructure and therefore cycleways often switch from one sidewalk to the other or to the central median, and each cycleway has its own (mostly seriously deficient) design. Cycleways are mostly narrow, curvy, interrupted for example by public transport stops, with obstacles such as trees, street signs, and finally special 'features' such as sharp turns at crossings (see chapter 6).

Although cycleways are being used, especially by inexperienced cyclists, their location and bad design still communicates a prioritisation of the car. Despite the deficient designs, cycleways are used. This is confirmed by the evaluation report of a bicycle promotion project with international funding (see section 5.2.3), which reports an increase in cyclists in proximity of a new cycleway (Steer Davies Gleave, 2009: paragraph 7.29) and by several interviews with members of cycling organisations, referring specifically to the value of cycleways to inexperienced cyclists (Interview 2, 30/03/2011) and to women cyclists (Interview 3, 06/04/2011). However, the interaction of cyclists with this infrastructure often creates the impression that the cycleways are not constructed for transport cycling.

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This opinion was stated by an experienced male cyclist (Interview 29, 18/07/2011) as well as by an inexperienced woman cyclist (Interview 21, 07/07/2011). Pinch (2010) argues that technology does not inherently carry a meaning, but that the meaning emerges from the interaction with its users. In this sense, the road infrastructure constructs the meaning of driving and cycling and, according to many cyclists, the deficiencies of the cycling infrastructure communicated that cycling is not a serious transport option. This issue will be discussed in more detail in chapter 6.

Finally, with the expansion of Santiago and longer distances which need to be travelled intermodal trips, i.e. the combination of the bicycle with public transport, increase in significance. The bicycle is generally seen to be most competitive at relatively short distances, although there is disagreement as to the threshold.[6] A solution for longer distances can be the combination of cycling and public transport. However, the public transport pricing policy does not incentivise this strategy. *Metro de Santiago*, who is responsible for the urban underground train system which is referred to as *metro*, has provided secure parking facilities at some stations. However, with the introduction of the urban transport system Transsantiago a card payment system was established. If a trip combines bus and metro, the card automatically deducts the price of the bus trip from the metro journey. Therefore, reaching the metro station is free. However, bicycle parking for the day costs about half of a metro journey and thereby increases the daily commuting costs by 25 percent, which is prohibitive for many people.

5.1.3   Summary and discussion

This part of the chapter showed the problematic transport situation of Santiago in 2011, the political priority to accommodate the car which was expressed in a spatial and legal marginalisation of cycling. The existing mobility system is dominated by the practice of driving individual motorised vehicles and Santiago's road infrastructure as well as traffic regulations prioritise motorised transport.

Driving is embedded in the functioning of the city and is entangled with other practices, the material environment and infrastructure, laws and regulations, and the evaluation criteria for infrastructure interventions, institutions and organisations, and the role as source of income for the State, and finally imaginations of the city (see Urry, 2004). Even when traffic

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[6] Some municipalities referred to 5km, the representative of the Ministry of Transport mentioned 7km and on the weblog of *Arriba 'e la Chancha* the bicycle is promoted as the best option for trips upto 10km (Olivares Medina, 2013).

congestion shows that the city is saturated with cars, the reaction is rather more than less space for cars and rather less than more speed regulation, a misguided strategy according to Downs (1962) as well as Duranton and Turner (2011), who find that more space for cars exacerbate traffic congestion.

Cycling is an emerging practice. It requires public space, which is limited in the urban fabric, and therefore cycling competes with other modes of transport. The more cycling increases, the more conflicts arise. On the carriageway, the bicycle is often viewed as an obstacle which produces friction. Currently, the conflicts seem to emerge increasingly on the sidewalk. Pedestrians are complaining increasingly about cyclists. Cycling is marginalised in specialised infrastructure which is often very limited in space and suboptimal for performing the practice.

In conclusion, while infrastructure is broadly defined as *support* system for social activity, this definition disregards that practices may compete in and for the same space and infrastructure. In this case infrastructure which supports one practice may hinder the other. Therefore, although cycling takes place on the road, road infrastructure may actually hinder cycling while favouring driving. Additionally, special cycling infrastructure which separates cyclists from motorised traffic cannot only be interpreted as benign attempt at protecting cyclists; it can also be seen as attempt to clear the roads of the slowly moving obstacles that obstruct car traffic. Furthering cycling means dismantling the dominance of driving. Facilitating urban cycling means re-thinking the role of the car and the unconditional support the car has enjoyed up to today. In 2011, infrastructure provision still prioritises the system of automobility.

5.2 Recent history of urban transport cycling in Santiago

In order to understand transport cycling in Santiago in 2011, it is useful to look to the past. Practices are shaped by their history. As technology develops, societal knowledge is created, and cultural meanings change, the practice evolves and the shared repertoire of the community of practice becomes richer. As a review of the entire history of cycling in Santiago would go beyond the scope of this work, the purpose of this part of the chapter is to describe selected developments and events, which can be interpreted as milestones in the trajectory of transport cycling in Santiago because they have lasting importance for cycling as it is practiced and understood in 2011.

The trajectory of urban transport cycling in Santiago can be divided into three main periods. While cycling was a normal mode of transport before the 1970s, it became marginalised during the military dictatorship (1973-1989). In this period, the car became a symbol of social status while the bicycle was stigmatised as mode of transport for the poor. With the return to democracy the bicycle experienced a revival, first through a small close-knit ideologically motivated community of practice and later through a gradually growing rather pragmatic mass of practitioners.

This review will not include the first period until the 1970s. This period has a legacy in the form of both classic bicycles that still exist in the city and nostalgic images of cycling. It is often romanticised and represented in images of children riding their bicycles on the roads or the gardener on his bicycle with his girlfriend sitting on the horizontal top tube (these images were mentioned several times, for example by a local government official (Interview 16, 30/05/2011)). However, the growth of the city and the rise in car ownership have radically changed the conditions for cycling in the city. While the old images can serve as resources when cycling advocates present an alternative imagination of the city, the actual power of these images in terms of recruitment of carriers to this practice under today's conditions is limited.

This review will start with the stigmatisation during the military dictatorship (section 5.2.1). Rising car ownership and the stigma during the dictatorship diminished the community of practice considerably. I argue that although the stigmatisation of the bicycle as transport for the poor is being challenged today by several new images associated with cycling, the legacy of the military dictatorship still plays a significant role because rising car ownership is still interpreted as progress, urban planning is aimed to facilitate driving, and taking up cycling can still hold reputational risks for an individual.

In the 1990s cycling experienced a renaissance as political act against the new government (section 5.2.2). However, the new close-knit community of politically active cyclists did not merge with the dispersed group of traditional cyclists, which produced the first divide within the community of practice. During the first decade of this century, cycling developed from a minority to a mainstream practice. With investment in the promotion of cycling, new advocacy groups with different agendas and imaginations of the practice as well as new manifestations of cycling emerged (section 5.2.3). I argue that the rapid increase in cyclists overwhelmed the capacity of the existing community of practice to integrate and teach new carriers. As a result, the community of practice became fragmented and

conflicts among cyclists arose. The conflictual relationship between several pro-cycling groups was expressed in the controversies over the Bicycle Promotion Law proposal (section 5.2.4).

Further conflicts with car drivers as well as pedestrians arose with new inexperienced cyclists from the failure of the new public transport system Transantiago (section 5.2.5) and the success of the Providencia Public Bike Scheme (section 5.2.6). The Cycle Route Master Plan, established in a multi-stakeholder participatory process in 2007, was an attempt to create a common vision for the city. However, not all relevant groups participated to the same degree and conflicts remain in 2011. The dominance of the car was again expressed in the 2011 'Anti-Cyclists Law' initiative which aimed to establish the obligatory use of the sidewalk for cycling in the absence of cycleways (section 5.2.7). While the relationship between some cycling advocacy groups is slowly improving, the practice remains contested.

5.2.1 The stigma

While the bicycle used to be a common mode of transport in Santiago, the economic growth during the military dictatorship under Augusto Pinochet (1973-1989) led to a rapid rise in car ownership which is still on-going today (Instituto Nacional de Estadísticas, n.d.). While the car developed into a symbol of wealth, the bicycle became stigmatised as transport for the poor throughout the two decades following the military coup. The inferior status of the bicycle vis-à-vis the car is illustrated by a television advertisement for car loans from the Banco de Santiago in 1980 with the slogan "Cómprate un auto, Perico!" (Buy a car, Perico!) (Comercial: Banco de Santiago - Cómprate un auto, Perico, 1980/2010). In this advertisement, the young man Perico cycles to his beloved Ismé, looking forward to seeing her. On the entire way, the neighbours shout out "Buy a car, Perico!" and when he offers Ismé a ride on his bicycle, she repeats this emblematic phrase. He concedes and the two are seen entering a branch of the bank to apply for the bank's car loan. The advertisement is still widely known today and was mentioned several times in conversations and interviews. Ortúzar, Iacobelli and Valeze confirm the bias against the use of the bicycle which they attribute to television advertisements, namely 'years of (funny and well-done) car dealers' propaganda television sketches ridiculing bicycle use in the national TV channels' (2000: 354). The bicycle was stigmatised as backward technology and cycling changed from a normal to a ridiculous practice.

In the decade of the 2000s, cycling experienced an image change. In an interview, a cycling activist described the stigma and the change throughout the 2000s:

> Six years ago when I started using the bicycle [...], you can see that the general opinion was that if you used the bicycle it was because you did not have any other option, you could not even pay the bus; second, because you were a foreigner, *gringo*; or third an eccentric crazy person. And that a woman, additionally of [hesitates] not young, used the bicycle, she was definitely crazy. [...] Today that is not [the case] anymore, no one dares express that opinion anymore. First, there is a social brake to an opinion of this kind, and second there are now people who see [cycling] in a positive light, that it is a consistent attitude, environmentally desirable, etc. etc. So it has got a positive connotation that it did not have before. (Interview 3, 06/04/2011)

For this cycling activist, the bicycle was first linked to certain prejudices and stereotypes. Apart from the small group of foreigners, cyclists were either 'different' or they were labelled as belonging to the marginalised population of the city. The bicycle used as a mode of transport in general expressed a low social status of its user. At the time of the fieldwork, this had changed in that some people saw the bicycle as a vehicle for environmental change. Nevertheless, the reference to the 'social brake' which hinders the expression of the stigma, shows that the stigma had not been removed completely from the practice. The competition of multiple images of cycling will be discussed in more detail in section 5.2.6.

5.2.2 *Movimiento Furiosos Ciclistas* and *Arriba 'e la Chancha*

With the return to democracy, a group of leftist intellectuals and artists started writing socially critical contributions for newspapers signed 'Movimiento Furiosos Ciclistas' (Furious Cyclists Movement, MFC). They also initiated the collective cycle rides on the first Tuesday of every month, which still exist today. According to a cycling activist and friend of one of the original members of the movement, the first collective cycle ride took place in 1995 and consisted of about 6 cyclists who cycled from *Escuela Militar* to *Los Leones* (Interview 7, 13/04/2011). These collective rides often ended in a creative event in order to attract people and interest to the cause. According to a witness of the time, the horse of the statue of General Baquedano was once disguised as a bicycle (Interview 3, 06/04/2011).

The name of the movement was taken over in the mid-1990s by a group of young men. According to two members of the current MFC, these men approached cycling from diverse

ideological backgrounds, but were united in their aim to promote the bicycle. Some participated as environmentalists, some aimed to remove the poverty stigma from the bicycle, some aimed to combine sports and transport, some were anarchists or anti-capitalists fighting against the IMOFRE, the 'Empire of the motorised transport without brakes' (Interviews 4, 07/04/2011 and 15, 26/05/2011). Most members were equally critical of the new democracy as the original movement, but this new generation was more confrontational in their activism. They continued the collective rides in which the public space was claimed by the 'critical mass' of cyclists. In this period, dangerous driving was often met with vandalism of the particular car and potentially violence against the driver. This produced a wider public debate, the participation in the collective rides increased, and the movement grew. The MFC also established a website – the only one at the time – which provided information to cyclists in the whole country.

According to a member of the movement, the MFC took an explicit decision after a particularly confrontational situation to stop the vandalism of cars and promote the bicycle in a peaceful way (Interview 15, 26/05/2011). However, although the violence had stopped, the MFC retained an attitude of superiority vis-à-vis users of other modes of transport. A cyclist of that time stated in an interview:

> We felt really special. We were a subculture, enlightened citizens, who rode bicycles. So we were better than the rest of the city. (Interview 9, 14/04/2011)

This description by a member of one of the early cycling organisations suggests not only an attitude of superiority, but also a strong social cohesion within that group of cyclists.

The first split happened in 2001 when *Arriba 'e la Chancha* was founded. *Arriba 'e la Chancha* was an exclusive group of men in a first instance close to the arts and Dadaism, later more politically active. They saw the need for education around the issue of cyclists' obligations and rights, particularly in the case of an accident when insurance money needed to be claimed. The main target of these campaigns was the group of traditional cyclists, those cyclists who never stopped cycling throughout the dictatorship because they could not afford a car, as they were most vulnerable in the event of an accident. While the split happened because the MFC did not have an interest in that topic, the work of *Arriba 'e la Chancha* still shows that at that time an effort was made to integrate the community of practice further.

While today the attitude of superiority of some cyclists is often criticised and perceived as obstructive to the promotion of cycling, especially in the collaboration of some cycling

organisations with government bodies (see next section), in the cycling-hostile environment at the time, characterised by a transport system planned for the car as well as stigmatisation of cycling and the fear of ridicule, a strong subculture movement which provided support and social status within the group to its members may have been the only way for the practice to thrive. However, while the community provided training and support to its members, the highly integrated nature may have also made it inflexible in the face of practice innovation. This will be seen in the next section when a rapid increase in cyclists with new manifestations of cycling produced tensions.

5.2.3 The GEF project and rise of cycling organisations

The first considerable investment in the promotion of cycling and the provision of cycling infrastructure occured in the context of a comprehensive urban transport project with funding from the Global Environment Facility (GEF), which was approved in November 2003. The main component of the project was the support for the modernisation of Santiago's new bus system. Simultaneously, the project included the completion of 50km of cycleways (of which 22km were GEF-funded) in the three municipalities Santiago, Providencia and Ñuñoa as well as the implementation of a promotional strategy aimed at changing travel behaviour and a safety strategy aimed at reducing accidents and improving personal security (World Bank, 2010). It is targeted at the three wealthy municipalities because the aim is to achieve a) a switch from driving to cycling in order to reduce greenhouse gas emissions, and b) an image change by situating cycling in wealthy neighbourhoods.

While the Implementation Completion and Results Report of the GEF intervention states that 'strong grassroots movements were able to engage in the discussion at government level, becoming key members of technical working groups that helped define the future of [non-motorized transport] in Chile' (World Bank, 2010: 26), the collaboration of civil society organisations in this project was marked by severe tensions and produced considerable challenges to the involved civil society groups.

The project generated a boost in interest in urban cycling. Several new pro-cycling organisations were founded, amongst which the Centro de Bicicultura, which seeks societal and urban transformations through the bicycle, and Macleta with a focus on women cyclists (see Sagaris, 2010 for more detail). These organisations have distinct outlooks on the practice and attracted a more diverse range of practitioners. In consequence, cycling

spread and the performance diversified. For the two older cycling organisations MFC and *Arriba 'e la Chancha* this change from being a close-knit community with a subculture feeling to being part of a diverse and potentially mainstream movement appears to have been a challenging change.

While all the involved groups had started as critical movements vis-à-vis the government elite, the GEF projects required civil society organisations to become partners of the government. The organisations struggled to maintain their critical integrity in view of the forced cooperation and the procedural requirements of the project. Furthermore, the GEF project required a professionalisation of the civil society organisations as they suddenly had to handle funding. The tensions between the old leadership of the community of practice and new innovative groups with a different understanding of the practice and of their role vis-à-vis government lead to accusations of opportunism and corruption. These tensions remained in 2011 and hindered the development of a joint enterprise across the rapidly grown community of practice.

5.2.4 The Bicycle Promotion Law proposal

When the cycling organisations met in 2006 in order to establish a road map for the promotion of the bicycle as mode of transport, there was general agreement that the promotion of the bicycle would need legal changes. However, the proposed Law to Promote the Use of the Bicycle (Ley de Fomento del Uso de la Bicicleta) resulted in renewed conflicts between the cycling organisations.

The proposal was initially put together by Omar Villanueva, the one man behind Chile Prociclista, and Centro de Bicicultura in consultation with other organisations and in collaboration with Congresswoman Carolina Tohá and a legal advisor. It was supposed to establish the importance of the bicycle as mode of transport and set out rules for its promotion. This included changes in traffic regulations; most importantly it established that in the event of an accident the stronger vehicle would be presumed responsible unless it could be proven otherwise, thereby legally protecting cyclists from dangerous driving. It also required all three levels of government to promote cycling and designated investment to this end. Amongst the more concrete measures was the obligation to construct bicycle storage facilities.

The proposal was introduced into the Congress by Carolina Tohá in 2009. However, the proposal which was introduced into the Congress had been considerably shortened and

changed from the original version elaborated by the cycling organisations. Most importantly, it had lost its budget, the establishment of a central institution for the promotion of urban cycling, and in several parts it had lost its obligatory character. Additionally, three obligations for cyclists were introduced: bicycles would be required to have a mirror and a bell, and cyclists would be obliged to use cycleways where they existed.

The changes to the law nearly broke up the Chilean Union of Cycling organisations (CUCH), which had formed in the course of the GEF project (Sagaris, 2010). Some organisations still supported the law, others feared that the new version would do more harm than good. When the proposal reached the Committee for Public Works, Transport and Telecommunications of the House of Representatives, Claudio Olivares from *Arriba 'e la Chancha*, Ricardo Jerez from *VeloSantiago*, and Omar Villanueva himself appeared in front of the commission and presented a series of complaints, amongst others the optional character of most actions, the overlap with the regulation through the Traffic Law (*Ley de Tránsito 18.290*), the above mentioned new obligations for cyclists and the lack of budget (see Olivares Medina, 2009). The disagreement between cycling organisations, then the earthquake in 2010 and the change to the first centre-right Government since the military dictatorship, all led to the proposed law being forgotten in Congress. In 2011, it had not been voted on and was deemed 'dead'.

Until today, the Centro de Bicicultura defends the law proposal as first important step, mainly because it establishes the hierarchy of vehicles in the event of an accident. On the contrary, the two older organisations, MFC and *Arriba 'e la Chancha*, reject the proposed law. They argue that there is no need for a bicycle law and propose specific changes in the Traffic Law. The reference to the Traffic Law is significant as it expresses an adherence to the ideology of *vehicular cycling* as described by Forester (1993). For Forester and his followers the bicycle is a vehicle equal in rights and obligations to any other vehicle in traffic and therefore regulated by the general traffic laws. Specifically this entails that vehicular cycling rejects segregated cycling infrastructure and, thereby, excludes many potential cyclists who are not 'traffic-tolerant' (Furth, 2012). The controversy around the Bicycle Promotion Law proposal was not only an expression of ongoing tensions between cycling groups which culminated in the disagreement in front of the Transport Commission. It was also a reflection of a fundamental disagreement about the status of the bicycle in urban traffic, the appropriate performance of cycling, and strategies to promote cycling.

5.2.5 2007 – the year of the Transantiago and the Cycle Route Master Plan

In 2007, the number of cyclists increased significantly because of the failed introduction of the new rapid bus transit system Transantiago. Transantiago aimed to integrate public transport throughout the city. However, its introduction encountered significant logistical and administrative problems, which led to severe deficiencies in service. Additionally, prices increased considerably so that in 2011 people on minimum wage spent up to 17 percent of their income solely on commuting to and from work. All these problems led to a rapid influx of new and inexperienced cyclists to the community of practice who were not necessarily organised or politically active. This made it more difficult for the cycling organisations to support these cyclists and, crucially, to build mutual engagement and joint enterprise by transmitting shared meanings of cycling and common rules.

An attempt to create a shared vision for the city not only among cyclists but crucially among government officials from the national, regional and local level was the creation of the The Master Plan of Cycle Routes of the Bicentenary (*Plan Maestro de Ciclorutas del Bicentenario*). In 2007, the public transport crisis and extreme air pollution brought cycling on to the agenda of the Regional Government. At the same time, a Dutch consultancy, Interface for Cycling Expertise (hereinafter referred to as I-CE), made contact with *Ciudad Viva*, a civil society organisation concerned amongst other issues with active transport, and offered support for the elaboration of a cycling master plan. The two processes merged and the Master Plan was elaborated in a multi-stakeholder process with all institutions involved in the planning of cycleways, with international expertise and extensive public participation (GORE, Ciudad Viva and I-CE, 2010). In 2011, the Master Plan remained the main reference point for cycling policy in Santiago. However, although it brought together stakeholders from all the relevant groups, it was not able to integrate all of them to the same extent and some profound conflicts remained between cycling organisations as well as between government bodies.

5.2.6 The public bicycle scheme in Providencia

A further milestone in the recent history of cycling was the creation of a public bicycle scheme in the Providencia Municipality. It significantly contributed to the repositioning of the bicycle, but also brought to the forefront the conflict between cyclists and pedestrians. The public bicycle scheme was the first of its kind in South America and has grown from 40

bicycles at 4 stations in 2008 to currently 180 bicycles at 18 stations. The scheme is run by a private company contracted by Providencia Municipality. Registration and a monthly fee of £2.30 or an annual fee of £17.40 allow unlimited use of the bicycles within the Municipality for journeys up to an hour. The price is extremely low considering that the monthly fee is the equivalent of only four journeys on the public transport system. According to a co-founder of the scheme as well as the responsible official from the Municipality, the public bicycle scheme was successful from the start in terms of membership, trip numbers, accidents, theft and the general attitude of the public towards the system (Interviews 13, 17/05/2011 and 14, 25/05/2011).

In interviews with a co-founder of the scheme as well as the responsible official from the Municipality, it became clear that one aim of the scheme was to reposition cycling as a pleasant, simple and safe activity suited to everyone. The scheme attempted to target new cyclists, especially from demographic groups which usually display low cycling rates, for example women and the elderly population in Providencia.

This aim was supported through carefully managed publicity, which included photographs showing the relaxed nature of cycling on the cycleways of Providencia and the friendly support at the bicycle stations[7]. On the website of the public bicycle scheme (BPP, n.d.), one particular photograph shows a relaxed woman cyclist with a male cyclist in the background. The woman cyclist is enjoying the ride in beautiful weather. She is wearing fashionable clothes, including a pair of white trousers, which is a contrast to the former shabby image of cycling (see section 5.2.1) and also underlines that cycling does not require preparation in terms of special clothing. Furthermore, the woman in the photograph is not wearing any safety devices, such as a helmet or a high visibility vest. The photograph communicates that cycling on the public bicycles in Providencia is simple, pleasant and safe.

This new image is supported by the design of the bicycles: according to the co-founder of the scheme, the bicycle design included low pedals and a step through frame because they provide stability, which fosters the perception of safety. Additionally, the design of the bicycles reminds of the classic bicycles of the 1960s, which especially appealed to the elderly population in Providencia (Interview 14, 25/05/2011).

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[7] Due to copyright, these photographs cannot be shown here, but can be accessed on the website of the public bicycle scheme (http://www.bpp.cl, last accessed 27th April 2014) and on the webpage of the public bicycle scheme on the Providencia Municipality website (http://www.providencia.cl/servicios/ciclovias-y-bicicletas-publicas, last accessed 27th April 2014).

The advertisements for the public bicycle scheme also emphasise the friendly support at the bicycle stations in order to promote cycling as simple activity which everyone can try out. On the public bicycle scheme webpage of the Providencia Municipality website (Providencia, n.d.), a prominently positioned photograph shows a male client on a public bicycle and an employee of the public bicycle scheme at a bicycle station. The client is slightly older than the average stereotypical cyclist, which underlines that cycling is for everyone. Furthermore, the photograph shows a smiling young employee ready to take the bicycle back or give advice. This photograph communicates the friendly nature of the service and the support the clients receive. The co-founder of the scheme underlined the importance of this friendly human support at the stations, which this scheme provides as opposed to many automated schemes in Europe (Interview 14, 25/05/2011). Although more costly than the alternative, the human support at the stations has been maintained by the Municipality in the second tender.

While this scheme has been successful in contributing to repositioning and increasing cycling, it has also contributed to a new conflict in the public space: cyclists and pedestrians clash on the sidewalk. The orange flags on the back of the bicycles, which can be seen on most of the photographs of the public bicycle scheme and which look like an amusing addition to the bicycles, are actually a sign of this new conflict. As many clients of the public bicycle scheme are inexperienced cyclists, there has been a concentration of cycling on the sidewalk in Providencia. The flags were added to the bicycles to make cyclists more visible to pedestrians in order to avoid accidents, but that has hardly improved the situation. In 2011, Providencia Municipality received an increased amount of complaints from pedestrians who had been hit (or barely missed) by cyclists and who felt uncomfortable and threatened in their space. Pedestrians even established an initiative, founded in a facebook group 'Peatones Furiosos' (translated 'Furious Pedestrians' which refers to the name of the first organisation of cyclists 'Movimiento Furiosos Ciclistas'). This group aims at defending the sidewalk as space for pedestrians.

In an interview with a cycling activist, this conflict was seen as an opportunity:

> You as pedestrian, I as cyclist, we suffer from the same problem, that the roads are more and more foreign to us. Let's reclaim the roads. It's more than that, you and I, we need to be allies. […] The press loves to write 'WAR between cyclists and pedestrians'. What I see is an opportunity. We all feel uncomfortable. Thanks to the increase in bicycles, we have realised that we feel uncomfortable. So, let's make ourselves comfortable. (Interview 9, 14/04/2011)

According to the interviewee, the accidents between cyclists and pedestrians are only a symptom of a city that is planned around the car. The interviewee sees the solution in reclaiming the public space, i.e. the roads for cyclists and the sidewalks for pedestrians, and sees cyclists and pedestrians on the same side of this political struggle.

A cycling activist from a different organisation agrees that the accidents with pedestrians are only a symptom of a wider problem. However, while the interview quote above points to a general focus on cars in the planning of the city, here the problem is seen in the cycling infrastructure:

> I would say a really serious problem with it [the Public Bicycle Scheme in Providencia] is that it has reinforced the perception of the public - drivers, users, pedestrians and so on - but particularly drivers and cyclists that sidewalks are for cycling, and I think that's a really negative phenomenon. It comes from: Providencia's approach to cycling infrastructure is to either put it on the sidewalk or make it look like a sidewalk, and therefore not meet sort of basic quality criteria, and it's really reinforced by implementing a programme like that [the Public Bicycle Scheme in Providencia], without having proper on-road infrastructure. I have only really stood and looked at the [bicycle] stand in Manuel Montt, but that's a very telling one because it's right outside the subway, it's very central, it's in a key location, a lot of stuff happening around there, and people get on those bikes and ride on the sidewalk, because there is no cycleway there, so right away you are telling people: this is where you ride, on the sidewalk. And so they have a really serious and growing problem with accidents. (Interview 28, 18/07/2011)

According to the interviewee, infrastructure communicates certain norms through its design. In Providencia, even the cycleways which are built in the space of a former car parking lane are elevated to the level of the sidewalk. According to the interviewee, these cycleways communicate that cycling is done on the sidewalk and this image has an impact on the practice which goes beyond its performance in that particular location. Rather, it shapes the way we think about, understand and imagine cycling in the whole city: on the sidewalk segregated from cars. According to the interviewee, the creation of a public bicycle scheme needs to be accompanied by adequate on-road infrastructure to support the practice in situ and to communicate to the general public in the entire city that cyclists belong on the road and should be respected by drivers as part of traffic. The 'safety in numbers' phenomenon (Jacobsen, 2003) confirms this strategy.

5.2.7   The 'Anti-Cyclists Law' initiative

The conflict between cycling and driving culminated in April 2011 when the right-wing political party UDI tabled an amendment to the Traffic Law (*Ley de Tránsito 18.290*) which proposed to ban cycling from the carriageway (14th April 2011, Publication number: 7593-15). According to the proposal, cycling should only be done on cycleways and in their absence on the sidewalk.

Interestingly, the proposed amendment was framed as enhancing the safety of cyclists. However, the cyclists viewed the proposal as an attempt to withdraw their right to cycle on the road and to clear the carriageways from cyclists in order to enhance car flow.

The project caused considerable discontent among cyclists and several mass cycle rides were organised to demonstrate against it in which the main cycling organisations participated jointly. On Friday the 15th April the first mass cycle ride ended in front of the offices of the television station Canal 13 in order to create publicity for the issue. On Monday the 18th April a second mass cycle ride ended in front of the UDI headquarters where a letter was presented to the party members (Udo, 2011). The following Monday, 25th April 2011, UDI received a group of representatives of cycling organisations in order to hear the objections to the proposed amendment. As a result, the party decided to withdraw the proposed amendment, which was effected in Congress on the 3rd May 2011.

5.2.8   Summary and discussion

The recent history of cycling in Santiago shows a movement from a stigmatised minority activity with a close-knit community of practice to a more widely spread, but contested practice with a fragmented community of practice. The last decade has seen a great influx of new cyclists, fuelled amongst other things by the activities of the cycling organisations, the bicycle promotion under the GEF project and the Providencia public bicycle scheme as well as the failure of the Transantiago Bus Rapid Transit system. While the community of practice has grown and cycling has become more normal in Santiago, the community of practice has become fragmented, which could be seen most clearly in the struggle over the Bicycle Promotion Law. I will return to the idea of a fragmented community of practice in the third part of the chapter.

Simultaneously, the last decade has seen efforts to reposition the bicycle and remove the stigma of cycling which originated in the car-oriented 1970s and 1980s. While the activities

of the cycling organisations, the bicycle promotion under the GEF project and the Providencia public bicycle scheme have worked towards establishing positive images of cycling, the city has also seen efforts to marginalise the practice, such as in the 'Anti-Cyclists Law' initiative.

Finally, the growth of cycling has led to severe conflicts with other mobility practices, mainly with driving, but also with walking. The stigmatisation of cycling was crucially produced by the normalisation of driving, rising car ownership and the interpretation of individual motorised mobility as progress. Today traffic congestion is severe and the two practices compete over carriers and public space, most clearly expressed in the 'Anti-Cyclists Law' initiative. The perceived risk of cycling in traffic has increased the manifestation of cycling on the sidewalk and has produced conflicts with pedestrians.

In conclusion, these selected events in the recent history of urban cycling in Santiago reflect multiple and intertwined conflicts: first disputes within the community of practice, second a struggle over the image of cycling, and third the competition over public space and carriers between motorised transport, cyclists and pedestrians. These are linked to disagreements about the potential role for cycling in the urban transport system, as well as wider issues about access and equality in the city which were discussed in part 1 of this chapter. These conflicts have become an inherent part of the practice and the identity of the community of practice.

5.3   Cycling as a practice

This part of the chapter will explore the practice of urban transport cycling in Santiago de Chile in 2011. Describing cycling in all its complexity of bodily and mental activities, materiality, linked knowledge and understanding, rules, the emotional experience and performance is difficult. I have decided to make a selection here, focusing on the conflicts inherent in the practice, because these will affect the way interventions can take effect. I will return to the conflicts and disputes presented here throughout the next two chapters.

5.3.1   General understandings

During the fieldwork, I was struck by how fervently cyclists distinguished transport cycling from leisure cycling. I learnt that cyclists constantly struggle with two linked general understandings in the population: first, that cycling is an appropriate mode of transport for

the young, but one should naturally progress to other modes of transport; second, that cycling is a sports or leisure activity, but cannot be taken seriously as mode of transport.

Many interviewees had learnt to ride a bicycle while they were children. At that age, cycling was a leisure activity that was done in the afternoons after school. At most, cycling was used to visit friends, but mainly the children from the same street would come together to ride their bicycles. Cycling was not normalised as mode of transport, but rather remained a leisure activity. Therefore the bicycle, as most toys, was abandoned for some other pastime as the children grew up and mobility needs during the teenage years were mostly covered by public transport.

University appeared to be a common moment to return to cycling. One student cyclist stated that "here at University the culture of riding a bike is celebrated" (Interview 29, 18/07/2011). However, several interviewees reported that their parents were very worried when they returned to cycling.

> The first time that I came here to the university by bike, my father was shocked. My mother knew, and my father saw me arriving in the afternoon on my bicycle, and then he shouted at me, he got angry and all that, because he was saying that I was taking a big risk. (Interview 29, 18/07/2011)

This quote from an experienced male cyclist shows the pressure cyclists are under from their families.

In adulthood the bicycle is commonly abandoned with the purchase of the first car. Many interviewees mentioned the end of University and the first job as moment for that purchase and of abandoning the bicycle (again). It appeared from the interviews that the move from the bicycle to the car was generally considered the normal development of life. A cycling activist recalls how he started to use the bicycle for his work commute, which made him realise how uncritical people were about the 'normal' course of life of buying a car and commuting long distances:

> You didn't question it, that is how it was, you abandoned the bicycle and then you bought a car, no one questioned that. (Interview 2, 30/03/2011)

Daley and Rissel observe the same phenomenon: 'While riding was seen as a legitimate form of transport for young people, it was assumed they would progress to driving as soon as they were old enough, socially reinforced as a rite of passage to adulthood' (2011: 214). Here, the reference to adulthood shows an additional pressure. While cycling is a minority practice and therefore potentially considered 'strange' (Horton, 2007), continuing to cycle

after leaving university then means rejecting adulthood and respective responsibilities, such as a car loan. In this sense, the image of the cyclist as irresponsible is therefore not only based on 'reckless' cycling in traffic, but also on the notion that the entry to adulthood is postponed. In this context, the repositioning of the bicycle as mode of transport for white-collar commuters is significant (see next section).

The second struggle is the dispute over the role of cycling in the system of mobility. A general opinion seems to be that cycling can only be taken seriously for very short trips and that it cannot compete against the car. Cycling activists continually stress that the bicycle is not (only) a toy or an instrument for sports and recreation, but that it is a serious mode of transport which can compete with motorised transport. For example, *Arriba 'e la Chancha* organises an annual comparison of travel times between different modes of transport on a given journey[8] in order to show that the bicycle is a competitive mode of transport (Olivares Medina, 2013). The competition between urban transport cycling and motorised transport will be further discussed in chapter 6.

5.3.2 Contested images

In section 5.2.1, I discussed the stigmatisation of cycling and the beginning shift towards new images. This section will focus on the diversity of images which co-exist in 2011. The shift from the stigmatisation of cycling as transport for the poor to more positive connotations was confirmed by several interviewees, such as two students from the Women's Cycling School who, prompted with the Perico advertisement (see above), expressed their contrasting image of cycling:

> But I see a lot of people now who, people, young girls, people who are 30, 30 and something years old, I have noticed, who ride bicycles, and you can see that they are on their way to the office because of the clothes they wear, with the handbag in the front basket and they use this mode [of transport], I have seen many, and men as well with their suits on bicycles. […] I think now it's the other way around [from the image that poor people cycle]. Now it's people who work, professional people who cycle; but young like 30 or 30 and something years old. (Interview 21, 07/07/2011)

> I remember what you say about the image of "Cómprate un auto, Perico!" and whatever, but I have a different connotation. For me the most typical image of cycling is the people who commute to work by bicycle. [...] That's the image that I think of, the opposite of negative, totally positive. Those are people who are

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[8] In the latest measurement, the bicycle was faster than the car and several modes of public transport and was only beaten by the motorcycle (Olivares Medina, 2013).

greener, more concerned about the environment … I like cyclists. (Interview 26, 14/07/2011)

Whereas the bicycle formerly stood for a lack of financial means to purchase a car, these quotes illustrate that today some people have formed an alternative understanding which links cycling to young professionals. When this image was described, formal clothing such as suits or high heels were often mentioned, which underlined the difference to the former rather shabby image. These associations contradict the image of the poor construction or factory worker on the bicycle and situates the bicycle in a wealthy and educated context where people in formal clothing commute to their office jobs. The second quote adds that the practice represents a progressive and altruistic attitude of the rider and a concern for the environment.

However, even if the negative view of the bicycle is not generally openly stated anymore, it still exists and can be detected in side remarks. When I asked an elderly man whether he used the bicycle as recreation or transport, he rejected the latter:

VW: And do you use the bicycle more for leisure purposes …
Respondent: Yes, yes.
VW: … or also for transport?
Respondent: No, no, no, at the moment I don't need to use the bicycle for transport, yet. (Interview 22, 10/07/2011)

For this man, cycling was a leisure activity. Using the bicycle as mode of transport could only be contemplated out of necessity. An additional dimension of the stigmatisation was brought up by a cycling activist who differentiated between different types of cyclists according to their place of residence and, linked to that, financial status:

No one wants to be poor, no one wants to be a cyclist from Pudahuel, but they do want to be a cyclist from Providencia. (Interview 15, 26/05/2011)

This quote suggests that while cycling in Providencia may have overcome the stigmatisation and prejudice and may even have attained some form of social status, cyclists from Pudahuel, a low-income municipality, actually still carry the stigma of poverty.

The persistence of the stigma is significant because it fuels the conflict between cycling and driving and because it exposes new carriers. First, the view of the bicycle as a transport option exclusively in times of financial hardship prolongs the association of economic growth and prosperity with rising car ownership. Positive, forward-looking urban planning would therefore be based on the assumption of an increasing number of cars and not with

the aim of redistributing space to non-motorised modes of transport. Additionally, even if silent, the stigmatisation still produces a dangerous inequality of different modes of transport on the road. The international campaign '*Somos tráfico*' (We are traffic) illustrates that cyclists still struggle to be recognised as legitimate and equal part of traffic. 'Somos tráfico' has become a slogan. Legally, this is not actually an issue. Chilean traffic is regulated by the Traffic Law which defines the bicycle as vehicle equal to cars. Cyclists, therefore, must abide by the same rules as drivers of motorised vehicles. However, in busy traffic cyclists are often perceived as an obstacle to the flow of the cars and buses and treated accordingly. Dangerous driving around cyclists and shouted insults are common, as I had to experience regularly while cycling in the city.

Second, the stigmatisation of the bicycle still leads to a reputational risk for new cyclists. The fear of ridicule for doing something different was expressly mentioned by a cycling activist as obstacle to take up cycling:

> … ridicule, because in Chile we have a group culture and a culture of being in a group and mocking another person. It's the fear of ridicule. So, it's super difficult that someone would do something different, except if it is shown on TV. If it is shown on TV […] how cool! But in a group to do something different, the others give you weird looks, they give you nasty looks, and 'that's the weird guy who does that thing', like, before we were the crazy bike people. Now it's a national topic and no one says anything anymore, but you are ridiculed in a different way. In Chile, the person who does something different is ridiculed. (Interview 2, 30/03/2011)

This quote suggests that it is problematic to be a 'pioneer' and, therefore, the expansion of new practices is slow and difficult until there is a critical mass, the practice is shown on television or made a political topic. It appears that the acknowledgement in the media or in politics contributes to the normalisation of the practice which in turn protects the members of its community of practice.

Finally, the competition between cycling and driving has produced the new image of cycling as dangerous practice. The danger of motor traffic was an issue in nearly every interview. There was an overwhelming agreement encompassing cyclists *and* non-cyclists that motor traffic was characterised by a general lack of respect for any participants in traffic, especially cyclists and pedestrians. As will be shown chapter 6, infrastructure planning is mainly based on this image of the cyclist as 'helpless victim of dangerous motor traffic' (Forester, 1993: 504), who needs to be protected. On the other hand, cyclists therefore were sometimes regarded as non-conformists, rebels and risk-takers, which are images

that are especially difficult to reconcile with the expectations associated with the traditional role as a woman.

While the stigmatisation of cycling as transport for the poor and inferior to the car is being slowly dismantled, new prejudices and stereotypes have developed. One very strong image is that cycling is for the young and fit. A cycling activist described the cycling career of his mother:

> At first the other women in the neighbourhood cried 'Look, that old woman riding the bicycle, she thinks she is young [...] she thinks she is better than us. They shouted all sorts at her. And now they approach her to ask her where they can get a bike and things like that, because she looks so young, she has lost weight, she looks good. (Interview 2, 30/03/2011)

Again, this quote shows a change in attitude of the general public, but it also illustrates that taking up cycling can include a very difficult phase for the individual at the beginning linked to the assumption that cycling becomes an inappropriate practice at a certain age. The requirement of fitness also seems to deter potential practitioners. As an experienced young male cyclist put it:

> But really it's a big obstacle for those people who would like to ride a bicycle if they think that they haven't done any exercise for a long time and then they think that now is not the moment to reconcile with the state of their physical fitness. (Interview 29, 18/07/2011)

The fear of being too unfit to cycle here deters people from cycling. The 'identity threat' of being unfit or out of shape as well as the way physical exercise in public may challenge understandings of age are discussed by Aldred (2013) who finds that there are negative associations with being a 'proper' cyclist with the respective gear (helmets, lycra and high visibility clothing). The high visibility clothing was an issue in Santiago for women as well as men who felt that it clashed with their personal sense of style. Horton adds the fear of 'using one's body, of sensing one's body, of getting sweaty' (2007: 135), which again was a concern for women as well as men in Santiago.

5.3.3 Fragmented community of practice

The community of practice of transport cycling in Santiago grew considerably and became more fragmented in the decade of the 2000s. During the military dictatorship only few people had continued to use the bicycle, generally out of necessity. Today, these practitioners are often referred to as 'traditional cyclists'. At that time, the bicycle

represented an integral part of everyday life and mobility. However, it does not seem to have generated a cyclist identity for this group of individuals. When the MFC emerged in the mid-1990s, the traditional cyclists were a dispersed group and not politically organised. The MFC was a close-knit group, although its members came from different ideological backgrounds, with a strong identity based in the bicycle. Although later *Arriba 'e la Chancha* made an effort to educate traditional cyclists about liability and insurance in accidents, the traditional cyclists and the two original cycling organisations never merged.

The decade of the 2000s brought several new cycling organisations. *Ciudad Viva* developed a focus on cycling among its urban themes; *Centro de Bicicultura*, *Macleta* and *Recicleta* were founded. Several university bicycle workshops and local cycling groups emerged. Cycling became more and more diverse. Some of these groups had distinct ideologies and underlined the socio-political nature of cycling. Cycling was promoted as a serious transport alternative, but was actually seen as much more than that. Cycling was connected to broader political ideas of environmentalism, taking back the city, democratising and liberating the city. The bicycle carried the hope and imagination of a better city and better quality of life for its people. A member of the new organisations described the period of the GEF project and a particular seminar with Henrique Peñalosa in 2003:

> The interesting point of all this is that this is the germ of the new vision of the bicycle as instrument of cultural change, as device for change of every human being, of every individual who proves to be autonomous and free through the bicycle. And it has a vision of urban transformation, democratising, inclusive in which the bicycle is part and symbol of human energy. (Interview 3, 06/04/2011)

The second half of that decade witnessed a wave of new cyclists. However, according to some cycling activists these new cyclists were not motivated by the grand ideas, but rather by individual benefits:

> Interviewee: The people who try out cycling, they get that it's healthy, that it's fast, that it's economical, that it's efficient, that it's cool, that it isn't ugly
> VW: So you are saying that now it's less ideological and more pragmatic?
> Interviewee: Yes, clearly, clearly. (Interview 15, 26/05/2011)

New cyclists, some of which started to cycle through the Providencia Bicycle Scheme or because of the failure of the Transantiago, were focused on their benefits. They often remained outside the cycling organisations which made it hard to establish common rules

and a joint enterprise within the community of practice, to which I will turn in the next section.

5.3.4 Contested performance

Cycling performances differed considerably in Santiago and seemed to be shaped significantly by the perceived risk of motor traffic. Cyclists seemed to actively find solution strategies to negotiate the risks of motor traffic in their performance. Some, mainly more inexperienced cyclists, selected their routes according to the availability of cycleways or wide sidewalks which allowed cycling. "As far away as possible from cars" (Interview 27, 15/07/2011) was a common strategy among less confident cyclists such as this interviewee. Experienced cyclists generally avoided sidewalks. Many even avoided using cycleways, preferring to ride on the carriageway, even though that frequently produced conflicts with car and bus drivers who expected them to ride on the specialised infrastructure. These cyclists took into account the quality of the cycleway and the speed difference between cycling on cycleways and on the carriageway. On the carriageway, some cyclists generally stayed on the right-hand side, while others preferred cycling on the left in order to avoid buses, and some filtered in and out of traffic, completely adapting to the rhythm of motor traffic.

In the literature one can find that these different styles of performance generate mutual criticism among cyclists (Skinner and Rosen, 2007; Aldred, 2013). Skinner and Rosen found that the identity of commuter cyclists often involves the distinction of one's own safe and responsible cycling from other cyclists' dangerous and irresponsible behaviours. In Santiago, the main criticism among cyclists was not against the 'reckless' type of cycling in traffic, although that did exist, but against cycling on the sidewalk, which is mainly a criticism of inexperienced cyclists.

There are several considerations which could lead to this criticism: an annoyance with new bicycle users who cycled without learning the rules of the practice; a general concern for the image of cycling if conflicts with pedestrians should escalate; a general belief that cycling should be performed on the carriageway and that all cyclists should defend their space on the carriageway; or a reference to the Traffic law, which will be considered next.

The Traffic Law was a common reference point for the discourse on cycling, but its actual power to structure the practice seemed limited. According to Schatzki, practices are organised by rules, which 'enjoin, direct, or remonstrate people to perform certain actions'

(2002: 79). People take account of these rules and adhere to them when they perform the practice (ibid.). Similarly, Wenger (1998) refers to the idea of accountability in the joint enterprise of a practice community which can be reified in rules. Novices learn these rules through the engagement in practice. However, Barnes limits this ideal description of rules and states: '[w]hatever is accounted agreement in the following of a rule is produced by the membership that follows it, not by [the rule itself]' (2001: 26). While the Traffic Law officially classifies the bicycle as vehicle and the use of the bicycle is, therefore, bound to the same rules as driving a car, I observed that certain groups of cyclists ignored certain obligations set out in the law. While some cyclists defended the law, there were many who did not know the law and certain traffic offences were acceptable among certain groups of cyclists.

One of the common traffic offenses by cyclists was cycling on one-way streets in the wrong direction. The evaluation report of the GEF project observes this infringement (Steer Davies Gleave, 2009: paragraph 7.27) which appears to be quite accepted. An experienced male cyclist clarified:

> Interviewee: The facility of the bicycle is that you can … even go against the sense of traffic.
> VW: You do that?
> Interviewee: If it's a local road, yes, but if it's a main road, no. Well, look, around here within [on the local roads between the main roads] I would do it, but not on Blanco Encalada [main traffic artery in the municipality]. That no. That is very dangerous. (Interview 29, 18/07/2011)

Rather than the rule set out in the Traffic Law, this cyclist used his own evaluation of the risk linked to riding against traffic as criterion for this action. Here, the Traffic Law did not organise the practice.

Another example was cycling on the sidewalk. Although the Traffic Law states that cycling should be practiced on the carriageway and although cycling on the sidewalk was heavily criticised by pedestrians *and* other groups of cyclists (see above), it seemed acceptable and normal to a particular group of cyclists to whom it was a solution strategy that just made sense. The evaluation report by Steer Davies Gleave states: 'The high percentage of cyclists that ride on the sidewalk where there are no cycleways, reveals the little security the cyclists feel when they cycle on the carriageway. It also proves that cyclists have not assumed their role as riders of a vehicle and behave rather like pedestrians' (2009: paragraph 7.28). According to the authors, a high percentage of cyclists perceived traffic as

dangerous and therefore cycled on the sidewalk, which was confirmed by several interviewees. Again, it was a risk evaluation which provided the criterion for this action. In this case, higher risk lead to a disregard of the Traffic Law.

As to enforcement of the law, the interview with a police officer clarified that cyclists were unlikely to be fined if they were caught cycling on the sidewalk or on the left-hand side of the carriageway in order to avoid bus transit on the right-hand side (Interview 18, 14/06/2011). Here, the performance of the practice and the understanding of the challenges of cycling in traffic with buses had shaped the legal reality, not yet in the form of a change in the law, but as a shared rule. However, this agreement was precarious and broke down as soon as there was an accident. In that case, any unwritten rule vanished and the Traffic Law was the sole basis for the verdict, which meant that cyclists who did not adhere to the Traffic Law were taking a great personal risk.

In conclusion, officially cycling was regulated by the Traffic Law. However, in many instances the Traffic Law did not organise the practice. While some performances followed the law, many performances did not either because cyclists did not know the law or because they decided to ignore it based on the interpretation of the perceived risk and other considerations. These new rules, although not written down, are not individual but social in that they are shared, discussed, contested and maybe agreed upon among certain groups of cyclists. However, the acceptability of rule-breaking actions, while adhered to by certain groups of cyclists and even the police in certain circumstances, still remained contested, as drivers, pedestrians, experienced cyclists and judges disagreed for different reasons.

The disagreements on the appropriate performance of cycling in the general population but also among cyclists have produced a variety of documents aimed at standardising cycling. A significant effort to set standards for the appropriate performance from within the community of practice was the translation of John Forester's seminal work *Effective Cycling*, which promotes vehicular cycling, with prefaces by Francisco Huneeus and Edmundo Rojas, two members of the original cycling movement after the return to democracy. However, the concept of vehicular cycling has not been able to homogenise the community of practice. Other attempts at determining rules and standards of cycling find their expression in promotional materials, such as cycling manuals, brochures and flyers. These materials attempt to fill certain gaps of the Traffic Law, which is centred on motorised vehicles, or show how the Traffic Law can safely be implemented in

performance. They also attempt to standardise cycling and make cycling more predictable, as predictability is considered to enhance safety.

5.3.5 Disputes over cycling infrastructure

Cycleways are the most contested issue in the promotion of cycling. Many people justify not cycling by the fact that there are no cycleways. Today, this argument has been repeated so often that for some people cycling without cycleways seems an absurd idea. Beginners and non-confident cyclists often demand cycleways. Among the experienced cyclists, some use selected cycleways, many avoid most cycleways because they are "made for recreation, it's like for an outing with the family, with children" (Interview 29, 18/07/2011, also Interview 30, 18/07/2011) and because "probably it's more risky and more uncomfortable than staying on the carriageway" (Interview 24, 13/07/2011). With increasing experience the meaning of the cycleway changes, as this member of a cycling organisation explained:

> The cycleway is a track where you can learn to ride again and there you let go and just ride wherever. That's what is good about it. And when you have learnt, it has the opposite effect. You ride on the cycleway and you say "Oh this rubbish cycleway with holes and things!" But that is later when you already have the experience. At the beginning, it serves its purpose. (Interview 2, 30/03/2011)

While the cycleways have a purpose for inexperienced cyclists who have to re-learn to ride a bicycle, they are seen as dysfunctional by experienced cyclists. This change coincides with Pinch's argument (2010) that technologies do not carry intrinsic meanings, but that the meanings are found in the social groups that interact with the technology.

Although cycleways are a common demand among potential cyclists, they have different and contested meanings among current cyclists. These different meanings are reflected in the discussion on promoting cycling. I will now turn to the different approaches and positions vis-à-vis cycleways from members of some cycling organisations. Some activists demand cycleways. Often this is justified by the aim to accommodate potential new cyclists. Other activists speak against cycleways mostly out of fear that with cycleways cycling will be banned from the carriageway.

The most extreme position, the opposition to any kind of specialised cycling infrastructure as a principle, is adopted by some early cycling organisations, the most important of which is the *Movimiento Furiosos Cyclistas* (MFC). This opposition is based on John Forester's (1993) concept of vehicular cycling, which defends the notion of the bicycle as vehicle

equal in rights and obligations to any other participant in traffic. Cycleways are perceived as threats to the right to cycle on the carriageway with the motorised vehicles. The provision of cycleways can be interpreted as a concealed strategy to remove cyclists from the carriageways where they appear as obstacles for cars.

However, one member of the early cycling organisations modified his position on infrastructure after realising that vehicular cycling was not appropriate in certain situations, such as cycling in a relaxed way with a friend. He stated:

> I think that, yes, it is important to provide infrastructure if its intention is that I can use the mode of transport of my choice in a convenient, safe and efficient way. […] I oppose infrastructure that is proposed from the point of view of security […]: 'Let's do cycleways because in reality cycling on the road is dangerous.' What does this declaration imply? That I am not going to touch motorised traffic as it is currently, that I am not going to make it safer, and that you [the cyclist] that I am going to take you off the road so that you won't be hit – between the lines: so that you won't be a nuisance for motorised transport. (Interview 9, 14/04/2011)

The interviewee added that current cycleways were constructed with this fear in mind and that the design results showed this. He opposed more of this kind of infrastructure as a waste of public financial resources. While this position does not fundamentally reject cycleways, it rejects the framing of cycleways as necessity for the safety of the cyclist, as that would establish the carriageways as unsafe for cyclists. Also, his position criticises the prioritisation of motorised transport.

Ciudad Viva, an organisation with extensive expertise with regard to the planning and design of cycleways, takes a differentiated approach to infrastructure requirements, depending on the road type and respective vehicle flow (volume of vehicles per hour) and speed limit. *Ciudad Viva* refers to research undertaken which shows that the probability of death in an accident involving a car and a pedestrian increases exponentially with higher vehicle impact speed (see U.S. Department of Transportation, 1999 for a review). Most studies show that the fatality rate is around 5 percent at 20mph, rises to 40-45 percent at 30mph, reaches 80-85 percent at 40mph and nearly 100 percent for speeds over 50mph (ibid.).

Therefore, according to *Ciudad Viva*, motorways, expressways and trunk roads are designed for high volumes of traffic at high speeds and therefore require completely segregated cycleways. Collector roads are designed for medium volumes at the general city speed limit of 60 km/h. By reducing the speed to 40 to 50 km/h, it would be possible to

integrate cycleways on the carriageway with clear separating elements. Finally service roads and local roads have a lower volume of vehicles. On these roads, speed should be further reduced to 30 km/h and cyclists should have the right of way. Under these circumstances it would be possible to integrate cycling into traffic without specialised infrastructure (for more details see GORE, 2012: 34; see also Schepel, Godefrooij and Braakman, 2009; Schepel and Braakman, 2009). This approach prioritises the bicycle over the car as it combines cycling infrastructure with traffic regulation in the form of speed limits.

Finally, an experienced cycling activist from another organisation added a different perspective on cycleways: whether of good or bad quality, cycleways had been fundamental in increasing urban cycling, especially for women. This was because apart from "supposedly" facilitating cycling – this was said with a doubtful laugh – cycleways also had a symbolic function:

> but it's impact is much stronger as a gesture, as a symbol, because it sends out a direct message in which the authorities and society allow you, equip you, encourage you to use the bicycle. And the people hear this message clearly. And the bigger the amount – and when the mayors announce that it cost I don't know how many millions to construct the cycleway – the more the people feel that there is an important investment in this issue and that, therefore, it's a national and societal aim that people should use the bicycle. And that in some way authorises you to make use of your natural ancestral right as a human being to move through your own energy in a world in which this has been evermore restricted to the point where if you did dare to exercise it you were frowned upon. (Interview 3, 06/04/2011)

However, the interviewee added that this did not mean that building cycleways was the only way to achieve this result and that other approaches, such as traffic regulation, speed limits, right of way for cyclists, a good coverage of parking facilities, and bonus schemes for cycling, could have been more efficient and effective (Interview 3, 06/04/2011).

Cycleways play an important role in the normalisation of the practice even when they are badly designed and/or badly maintained. However, bad design, insufficient maintenance and the lack of connectivity of the network shapes the performance in such a negative way that experienced cyclists often avoid cycleways and the incoherence of the cycleways throughout the city additionally hinders the emergence of a shared understanding of the practice.

These different approaches and positions with regard to cycleways show the struggle between several social groups to establish the meaning of cycleways. The different understandings of cycling among the groups of cyclists produce the 'contested meanings' (Pinch, 2010: 80) of cycleways. Additionally drivers of motorised vehicles as well as pedestrians generate meanings of cycleways. The proposed amendment to the Traffic Law (see section 5.2.7), which was to establish the obligation to use cycleways, again shows a different meaning that cycleways carry for drivers of motorised modes of transport.

Pinch (2010) further argues that people can repurpose technologies for new use. This idea can be observed in the skaters, joggers, wheelchair users and mothers with prams often use the cycleway for their mobility. More interestingly, the avoidance of cycleways by many experienced cyclists also shows a repurposing in terms of non-use. These cyclists ride on the carriageway because they believe that the bicycle is a vehicle which belongs on the carriageway while the sidewalk (including the part that was transformed into a cycleway) should be for the exclusive use of pedestrians.

5.4 Conclusion

In this chapter, I have argued that urban transport cycling in Santiago is a contested practice because it is characterised by several conflicts which have become an inherent part of the practice in its configuration in 2011. In the following paragraphs I will summarise and structure the many conflicts which I have presented in this chapter.

First, urban transport cycling competes with driving. Urban transport cycling is embedded in the urban transport system of Greater Santiago. Following Watson (2012), I understand the urban transport system as 'system of practice' which is reproduced through the performance of the practices of which it consists. Watson argues that practices are embedded in systemic relations with other practices as well as systemic elements, including infrastructure and norms amongst others (ibid.: 493). Through an analysis of the traffic regulation and the road infrastructure, I showed that cycling is competing with driving in the urban transport system. Despite the problems caused by increased car use, such as traffic congestion and air pollution, car flow is prioritised over transport cycling. I argued that the existing regulations and infrastructure prioritise motorised transport and marginalise the bicycle legally and spatially.

Second, in the general population in Santiago the image of urban transport cycling is contested and people associate different images with the practice. During the military dictatorship, transport cycling was marginalised through a rapid rise in car ownership and stigmatised as mode of transport for poor people who could not afford a car. This stigmatisation is now challenged. While necessity cycling in lower-income communities has still got a somewhat negative image, cycling in wealthier parts of the city has been repositioned as an environmentally friendly and healthy activity. Even transport cycling here is often associated with white collar commuting, far removed from the shabby image transport cycling had twenty years ago. However, a very powerful image associated with urban transport cycling is that of a dangerous and risky practice. The fear of traffic accidents as well as of assaults and harassment is common in Santiago. These images significantly contribute to shaping policy as we have seen in the 'Anti-Cyclists Law' initiative which was framed as a measure to protect cyclists. Similarly, these images shape the planning and design of cycling infrastructure as will be seen in chapter 6.

Third, within the community of practice, which is fragmented in itself, there are disputes over the appropriate performance of urban transport cycling, the rules of the practice and the position on cycling infrastructure. The community of practice consists of a dispersed group of traditional cyclists, a close-knit ideological movement that began in the late 1990s, several new and diverse cycling organisations and finally another dispersed group of new cyclists who are not integrated into the community. Conflicts between established and new groups have emerged which in 2011 still produce harsh exchanges between groups. Finally, the positions of cycling organisations and individual cyclists vary with regard to the appropriate location of cycling (on the carriageway, the cycleway or the sidewalk), to the negotiation of traffic risks and the traffic regulations, and to the need for specialised cycling infrastructure. These differences can be interpreted as the inability of the community of practice to integrate and instruct the mass of new practitioners and negotiate a joint enterprise. I will return to this issue in chapter 7.

In the following chapter, I will explore the provision of cycling infrastructure as approach to facilitating cycling. I will argue that the contestedness of urban transport cycling is reflected in the planning and design of cycleways.

Chapter 6: Building practice

While the previous chapter explored the practice of transport cycling in Santiago, this chapter will turn to the first approaches to facilitating urban transport cycling, which I have labelled building practice, and examine the provision of cycleways. The increase in the popularity of cycling during the 2000s and the acknowledgement of the social and individual benefits of cycling, especially in view of the air pollution and traffic congestion in the city, had established cycling on the political agenda. At the time of the fieldwork, the President of the Republic of Chile had committed to doubling the number of cyclists in Santiago during his time in office (Piñera, 2009), and the provision of cycleways was the most common policy approach to increasing cycling in Santiago. I will argue, however, that despite the budding political will, the planning and design of cycling infrastructure is significantly shaped by the prioritisation of motorised transport in urban transport planning, which marginalises urban transport cycling and produces suboptimal cycleway designs.

In order to organise the vast variety of cycleway designs in Santiago, the first part will present a typology of cycleways, consisting of three categorisations. First, cycleways are distinguished in Chilean law according to their level of segregation. Second, cyclists often categorise cycleways according to their location within the road profile and the functionality linked to that location. Finally, a focus on the intervention allows a categorisation by distinguishing which other mode of transport loses space through the integration of a cycleway into an existing road profile. These types will be a reference point throughout the chapter.

In the second part of this chapter, four cycleways will be presented as case studies. They will provide the data for the analysis of the planning and design of cycleways. Pocuro is among the oldest constructed cycleways and has become an emblematic example throughout the city. Despite its luxurious appearance, it has serious design deficiencies which obstruct speedy transport cycling. I selected this case study to explore the myths of cycling which shaped the design. Isabel la Católica is a cycleway in the wealthiest part of the city and was voted best cycleway by the organised cyclists. I selected this case study because, despite its success, the design of the Isabel la Católica cycle path has not been reproduced in subsequent cycleway projects. I selected the Las Perdices cycleway project because it spans four municipalities, but at the time of the fieldwork only one municipality

had implemented the project. I used this case to explore the issues of coordination between municipalities because the benefits of cycleways only fully develop when cycleways connect as network. Finally, the Clotario Blest cycle path project was a considerable intervention in the public space on one of the main traffic arteries across Pedro Aguirre Cerda, a low-income municipality in cycling distance to the city centre. While cycling is common and mostly a necessity in this municipality, such investment in cycling infrastructure was a novelty which deserved attention.

The third part of this chapter will examine infrastructure planning and cycleway design. In the first section, I will explore five myths about cycling and the cyclist and show how they shape specific cycleway designs. I will argue that these myths about cycling emerge from the urban transport system and are shaped by the dominance of individual motorised transport. I will then turn to the planning process and identify four main actors. I will examine their role, their specific problems and solution strategies with regard to the planning of cycleways. I will argue that the technical and economic evaluations are significant obstacles for the facilitation of urban transport cycling through the provision of infrastructure because they uphold a prioritisation of car flow over all other modes of transport. Finally, I will focus on two political negotiations with regard to the planning of cycleways and the design of cycleways, which can be interpreted as attempts to progress towards stabilisation of cycleway development in Santiago.

6.1   A typology of cycleways in Santiago

Santiago presents an enormous variety of cycleways. At first sight, each cycleway appears unique. In order to be able to explore the questions of how cycleways come into existence and how they shape the practice of cycling, I will establish categories of cycleways which will help to organise the problems cyclists associate with certain cycleways and particular design 'features'.

This part of the chapter will therefore present three different categorisations of cycleways. In the first section, I will turn to Chilean legislation which categorises cycleways according to the level of segregation. While this is an important issue in cycleway design, it is only one issue of many.

The second section will therefore categorise cycleways according to the typical issues of functionality associated with certain locations of cycleways in the road profile. This part is

based on my own experience of using cycleways in Santiago and interviews with cyclists. I will distinguish cycleways on the sidewalk, on the central median and on the carriageway.

During the interviews with local planning officials and architects, a third categorisation emerged. Integrating cycleways into existing road infrastructure requires the reduction of the space of another mode of transport. This third categorisation will distinguish cycleways by determining whether space was taken from the pedestrians (from the sidewalk or the central median) or motorised transport (from the carriageway or the parking lane).

Later in the chapter, I will return to these types of cycleways and argue that in limited space no solution exists which is optimal for all users of road infrastructure and that the choice of the cycleway type expresses the political prioritisation of certain modes of transport as well as certain groups of cyclists and particular understandings of the competing mobility practices.

6.1.1   Categorisation according to the level of segregation

The Chilean Design Manual 'Recommendations for the Design of Elements of Urban Road Infrastructure', hereinafter referred to as REDEVU, defines three terms for specialised cycling infrastructure: *ciclovías*, *ciclobandas* and *ciclopistas* (Ministerio de Vivienda y Urbanismo, 2009), which can be translated[9] as cycleways, cycle lanes and cycle paths, respectively. According to the REDEVU, cycleway is the generic term for a part of the road infrastructure which is exclusively for the use of bicycles. A cycle lane is a cycleway which is visually separated through traffic signs and/or road markings (see figure 6-1). A cycle path is a cycleway which is physically separated through a strip of grass or gravel, bushes, trees, a difference in level, or other physical separators such as cats eyes or concrete blocks (see figure 6-2).

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[9] For the translation, I followed the glossary of the edited volume *Cycling-Inclusive Policy Development: A Handbook* (Godefrooij, Pardo and Sagaris (eds.), 2009).

Figure 6-1: Cycle lane (only visually segregated) on the carriageway.
República, Santiago, 24/08/2011. IMG_2416.

Figure 6-2: Cycle path, physically segregated from pedestrian as well as motor traffic through strips of lawn.
Pocuro, Providencia, 27/03/2011. IMG_1953.

Segregation is often discussed with regard to separating cyclists from motorised transport. A common argument against cycle lanes on the carriageway is that cars would not respect the cyclists' space. In an interview, a police officer explained that especially at peak times, drivers carry out risky manoeuvres in order to escape from the traffic congestion and most accidents happen at this time of the day (Interview 18, 14/06/2011).

While segregation is mainly discussed with regard to motorised transport, the REDEVU design manual also mentions the separation of cyclists and pedestrians (Ministerio de Vivienda y Urbanismo, 2009: 196). While cycleways on sidewalks are segregated from motorised traffic through the curb, they often experience considerable spill overs from pedestrians (and their children and pets), which can be dangerous for all involved parties.

6.1.2 Categorisation according to the functionality of the location

While segregation is an important issue, the experience of the practice shows that there are many more issues in cycleway design. From my own observations as well as conversations and interviews with cyclists, a second categorisation emerged based on the location of the cycleway and the problems linked to the particular location. In this section, I will identify typical issues of cycleways according to their location on the sidewalk, on the central median, and on the carriageway.

6.1.2.1 Cycleways on sidewalks

Most cycleways in Santiago are located on the sidewalk. The segregation from the carriageway in the form of the curb increases the sense of safety of some cyclists as it is a physical barrier between them and the cars and buses. However, cycleways on the sidewalk often experience considerable spill-overs from pedestrians. This can be due to the fact that after the construction of the cycleway there is too little space left for a family to walk together. According to my observations, however, the main issue is that pedestrians often do not realise that there is a cycleway or that it is for the *exclusive* use of cyclists.

Several municipalities in Santiago had considered coloured pavement for particular cycleway projects to alert pedestrians to the cycleway. However, according to a local urban planner the significant difference in cost had so far prevented the implementation in their municipality (Interview 16, 30/05/2011). The issue of pedestrians also came up in an interview with a former member of the Metropolitan Regional Government (hereinafter referred to as GORE). When the new cycle path on Vicuña Mackenna was inaugurated in 2009, he organised a collective cycle ride on the cycle path. The police had offered to facilitate the cycle ride on the carriageway, but he had insisted on using the cycle path:

> … because the cycleway is on the sidewalk, pedestrians often occupy the cycleway. But if we do this mass intervention, that is making this space our own. (Interview 5, 08/04/2011)

This quote shows that constructing a cycleway was not sufficient to establish that this space was exclusively for cyclists. The collective cycle ride aimed to actually *claim* this space for the cyclists.

Furthermore, driveways are a serious problem for cycleways on sidewalks. Drivers do not expect fast vehicles on the sidewalk and frequently cross the sidewalk without paying much attention, which at best forces cyclists to slow down and in the worst case can produce a crash. Then, drivers often stop on the cycleway until they can proceed onto the carriageway or drivers use driveways to park their cars. This position of the car forces cyclists to 'spill over' onto the carriageway or the sidewalk (see figure 6-3).

Figure 6-3: Car parked on a driveway, blocking the cycleway. Cyclists are forced to leave the cycleway and invade the space of the pedestrians.
Dublé Almeyda, Ñuñoa, 06/04/2011. IMG_1996.

Traffic generally relies on predictability of the actions of all participants. The provision of segregated infrastructure creates the expectation that all participants will remain in their space. Cycleways on sidewalks are problematic because they are the site of frequent unexpected and temporary spill-overs.

Furthermore, the integration of cycleways into an existing sidewalk often produces problematic design results. As the supporting elements of road infrastructure (street lights, electricity, water, sanitation and communication infrastructure, urban furniture and landscaping) are situated on the sidewalk, the cycleway that is subsequently fitted into the space, is often narrow and forced to curve around those obstacles (see figures 6-4 and 6-5).

Figure 6-4: Cycleway curving around a manhole.
Club Hípico, 23/04/2011. IMG_2065.
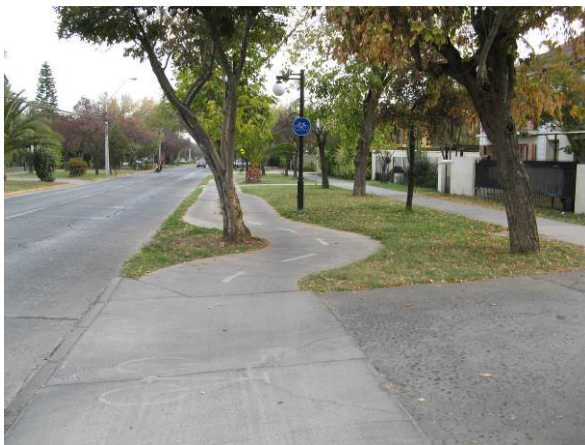
Figure 6-5: Although there is no lack of space, this cycleway presents a tight bend around a tree.
Juan Moya Morales, Ñuñoa, 06/04/2011. IMG_1999.

In an interview, a local urban planner admitted that adding a cycleway on a sidewalk was problematic:

> Additionally, as these things are always situated in the spaces that are left, the [cycleway] of [name of cycleway], that has some turns which indeed, let's say, as a cyclist, one is left hugging [smashed against] a tree. (Interview 16, 30/05/2011)

Obstacles are not only in the layout of the road, but also at higher levels. Bushes, low-hanging branches or low-hanging cables can be a distraction or danger for a cyclist,

especially when the cycleway is narrow (see figure 6-6). An experienced woman cyclist and cycling activist stated in an interview:

> ... it's ridiculous. Never mind that it's a slalom course and that the only time I ever felt I needed a helmet was on Simon Bolivar because of the low-hanging branches ... and, so I promptly got down on the road which of course creates conflicts with the drivers who expect you to ride on the infrastructure. (Interview 28, 18/07/2011)

This quote shows the annoyance which is caused by the curvy layout and the low-hanging branches of this particular cycleway. Additionally, this quote mentions conflicts with drivers. The provision of cycling infrastructure creates expectations in drivers that cyclists will only ride on the cycleway. The perception of the cyclist on the road as 'out of place' has been described by Horton (2007) and is one of the most important reasons for the opposition to cycleways by proponents of vehicular cycling (see Forester, 1993).

Figure 6-6: Bushes and low-hanging branches can be significant obstacles, especially when the cycleway is narrow.
Club Hípico, Santiago, 23/04/2011. IMG_2062.

Finally, the most critical part of cycleway design is the intersection. If the carriageway is not elevated for the cycleway crossing, curb cuts are required. As pedestrian crossings already have curb cuts for wheelchairs and prams, cycleways on sidewalks are often designed to merge with the pedestrian crossing. This design requires a significant reduction in cycling speed. First, merging pedestrian and cycle crossings generally requires a curve in the cycleway towards the pedestrian crossing which forces the cyclist to slow down. Second,

the speed difference between cyclists and pedestrians is similar to the speed difference between motorised transport and cyclists on urban roads (Daley and Rissel, 2011: 215) and needs to be reduced if pedestrians are to feel comfortable in the shared space. Third, the curb cuts for pedestrian crossings are generally too steep to maintain the cycling speed. Therefore, this design forces cyclists to slow down to the speed of pedestrians. Finally, as both pedestrians and cyclists are perceived to be vulnerable to fast-turning cars shared crossings are often situated at a distance from the intersection, forcing both cyclists and pedestrians into a considerable detour.

There are design features for cycleways on sidewalks that at least partly solve some of these problems, but they are only rarely employed in Santiago. A smaller radius of the curve at the intersection will slow turning cars down which could allow a closer crossing. Speed bumps will also achieve a reduction in speed of the cars and they can be constructed so that the cycleway crosses the intersection on top of the elevated structure, thereby avoiding the need for curb cuts. Pedestrian crossings can be maintained separate from the cycleway further away from the junction. Finally, separate green phases for cyclists can separate car and bicycle flows, and traffic rules can give cyclists and pedestrians right of way before turning cars.

6.1.2.2   Cycleways on the central reservation

In Santiago, some central reservations or median strips, i.e. the area which separates the two opposing carriageways of divided roads, have cycleways. These are similar to cycleways on the sidewalks in that they are segregated from motorised traffic, but often experience spill overs when a footpath is also included in the design of the central median.

In Santiago, cycleways on the central median are often surrounded by parks or some form of landscaping to make them attractive. With all cycleways through parks or landscaped areas where a footpath runs in parallel, the material of both paths is critical. If the cycleway is made of compressed sand, cycling produces significant amounts of dust throughout most of the year, which is not only unpleasant for the cyclist, but also detrimental to the bicycle. When it rains, the sand paths may transform into mud tracks, and puddles often transform into potholes with time (also a problem with the irrigation of the green areas). Finally, when the cycle path is paved, but the footpath is not, the probability of spill-over of pedestrians into the cycle path is increased.

The main problem with cycleways on central reservations is again at the intersections. As with sidewalks, the crossing is often shared with pedestrians which requires a considerable reduction in speed. More importantly, as the cars have the same green light phase as the cyclist and pedestrian crossing, turning cars can crash into pedestrians and cyclists. Also, as cars will then encounter a red light until they can continue their way, cars have to wait on the crossing of the pedestrians and cyclists which forces them to circle around the cars, thereby potentially having to move into the carriageway (see figures 6-7 and 6-8).
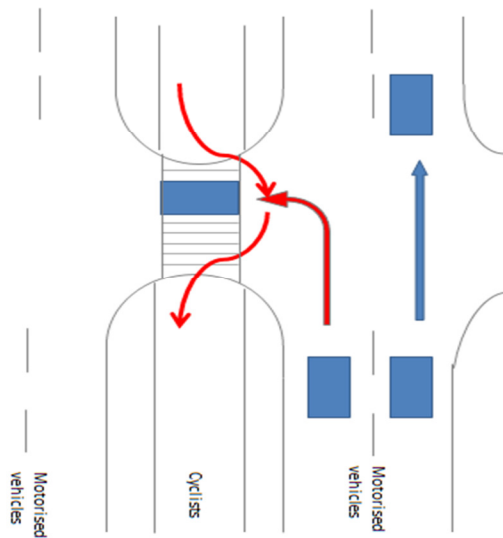
Figure 6-7: Schematic view of an intersection with a cycleway on the central median when cyclists and motorised vehicles have the same green phase.

Figure 6-8: The cyclist has to leave the marked cycle crossing in order to go around the car. Pocuro, Providencia, 27/03/2011. IMG_1958.

As can be seen in figures 6-7 and 6-8, the traffic light shows green for pedestrians (and cyclists) as well as for the motorised transport in the same direction. A left-turning car has

to wait for the other traffic lights and is blocking the pedestrian and cyclist crossing. Therefore, the cyclist has to cycle around the car in order to cross the intersection. He leaves the demarcated crossing and is vulnerable to car traffic on the carriageway. A local urban planner pointed out that this problem could be solved through providing an additional lane with a separate green phase for left-turning cars (Interview 16, 30/05/2011). Cars could then turn without stopping between the two carriageways on the crossing for pedestrians and cyclists.

6.1.2.3   Cycleways on the carriageway

Cycleways on the carriageway are comparatively rare in Santiago, but they were the most popular type among experienced cyclists because they follow a straight line without obstacles. Experienced cyclists often stated that the few cycleways on the carriageway were the only cycleways they actually used. Even less experienced cyclists often found cycleways on the carriageway acceptable as long as there was a good separation from motor traffic (Interview 22, 10/07/2011).

With this type of cycleway segregation is a significant issue as cars do not necessarily respect cycleways, especially when stuck in traffic congestion (see above). A member of a pro-cycling organisation reported once that he had found himself face to face with a car on the cycleway in Blanco Encalada, a supposedly physically segregated cycle path on the carriageway (see figure 6-9). The encounter gave him a fright and he was still rather flustered when he arrived at our meeting 20 minutes later.

Figure 6-9: Cycle path on the carriageway adjacent to the central median.
Blanco Encalada, Santiago, 24/08/2011. IMG_2419.

In the General By-Law of Urbanism and Constructions, five types of roads are defined in the order of decreasing design speeds and vehicle flows: expressways, trunk roads, collector roads, service roads and local roads. While no cycleways are contemplated for expressways, if cycleways are built on trunk roads they must be physically segregated. On collector roads and service roads cycle paths as well as cycle lanes are permitted, while on local roads no cycleways are contemplated. This differentiated approach coincides with recommendations in Schepel, Godefrooij and Braakman (2009).

Proponents of Vehicular Cycling fear that on-road cycle lanes will prevent the cyclist from moving into the car lane in order to avoid a 'right hook' situation at intersections (Furth, 2012). Cars overtaking cyclists and then cutting them off by turning in front of them was indeed a problem in Santiago which I encountered frequently. Bike boxes (also called advanced stop lines) are supposed to provide space for the cyclist at intersections and position them visibly in front of the cars so that they cannot be cut off. Dill, Monsere and McNeil (2012) find that bike boxes enhances the perceived safety of cyclists as well as drivers. However, at the time of the fieldwork I did not encounter any bike boxes in Santiago.

Another problem with cycle paths on the carriageway arises when the cyclist faces a left turn. In order to change lanes and arrive in the left lane in time, the cyclist must leave the cycleway. Physical segregation in the form of cats eyes or concrete blocks can be a hindrance. Cyclists in Santiago therefore often turned left by crossing twice on the right-hand side.

The cycleway on the carriageway is by far the cheapest type of cycleway. A cycling activist therefore argued in an interview that apart from the other advantages of this type of cycleway it is the only feasible solution for a city where resources are scarce (Interview 28, 18/07/2011).

6.1.3 Categorisation according to the intervention in the road profile

The last categorisation differentiates cycleways according to which other mode of transport loses space to the cycleway through the integration of the cycleway in the existing road profile. The integration of cycleways into existing road infrastructure requires a reduction in the space available to another mode of transport. Figure 6-10 is a schematic representation of road profiles in which I have illustrated where cycleways can be integrated and which other mode of transport loses space through the intervention.

The upper part of figure 6-10 shows the complete road without cycleways. From the outside towards the centre, there is a sidewalk with a paved part and a strip of vegetation followed by a lane of car parking on each side. The carriageways each have two lanes and are separated by a central median.

The second part of figure 6-10 shows the possibilities for the integration of cycleways (in orange) on the sidewalks and the central median. On the left, the width of the sidewalk has been halved and a narrow cycleway has been integrated between the sidewalk and the vegetation. Sometimes the location of cycleway and vegetation is inversed so that the cycleway is separated from the pavement by the vegetation. On the right, the sidewalk was slightly wider from the start so that the cycleway could be integrated without reducing the pavement. However, in order to preserve the trees, the cycleway has been designed as a curvy path around the trees. Finally, figure 6-10 also shows the possibility of integrating a two-way cycleway on the central median. These three options do not reduce the space of motorised transport.

A different strategy is to integrate cycleways in the space of the car. The bottom part of figure 6-10 presents two options for cycleway integration which reduce the space for driving and parking. On the right, space from the carriageway is transformed into a cycleway. A narrow cycle lane may still allow two car lanes. A wider, possibly physically segregated cycle path will require the elimination of a car lane.[10] On the left, a parking lane has been transformed into a cycleway. This has been done in Providencia in the context of the GEF project (see chapter 5) on Antonio Varas. The cycleway was elevated and made to look like a cycleway on the sidewalk and today exhibits the same problems at junctions as cycleways on the sidewalk. Between junctions, however, it is straight and has a width that was satisfactory at the time.

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[10] A further possibility not shown in the graph is the integration of the cycleway between the parking lane and the sidewalk, by eliminating a car lane and shifting the parking lane. This option has become quite common in some European countries but was negligible in Santiago in 2011.
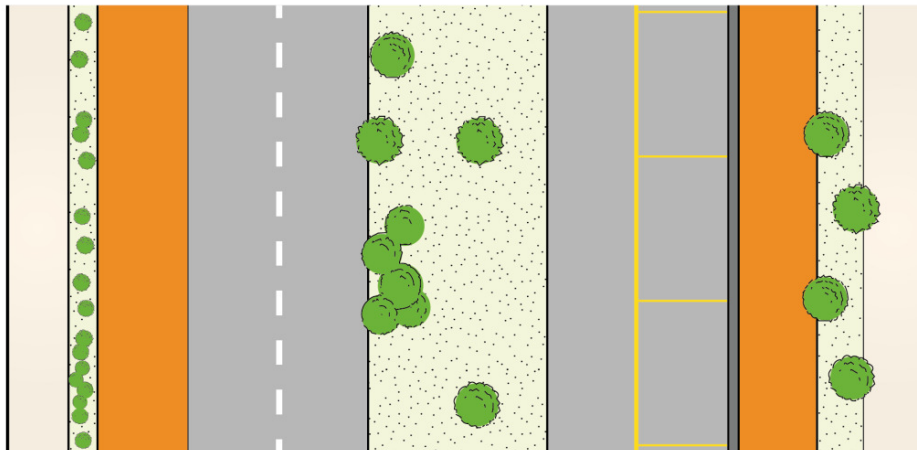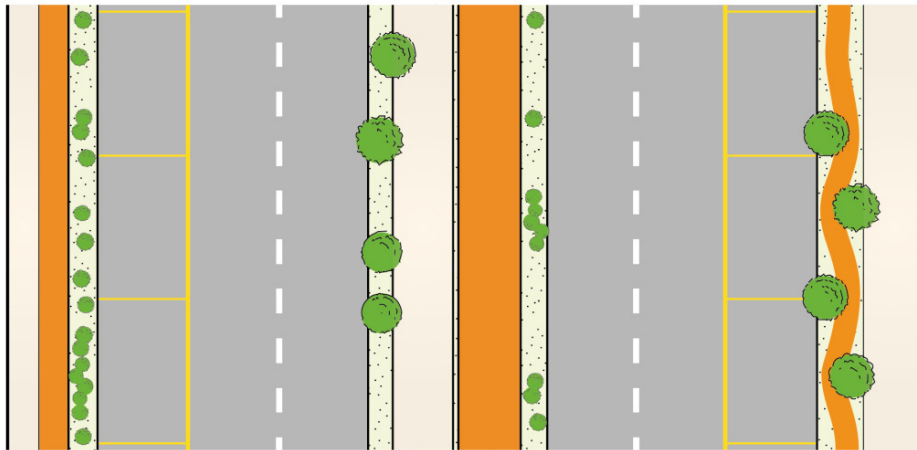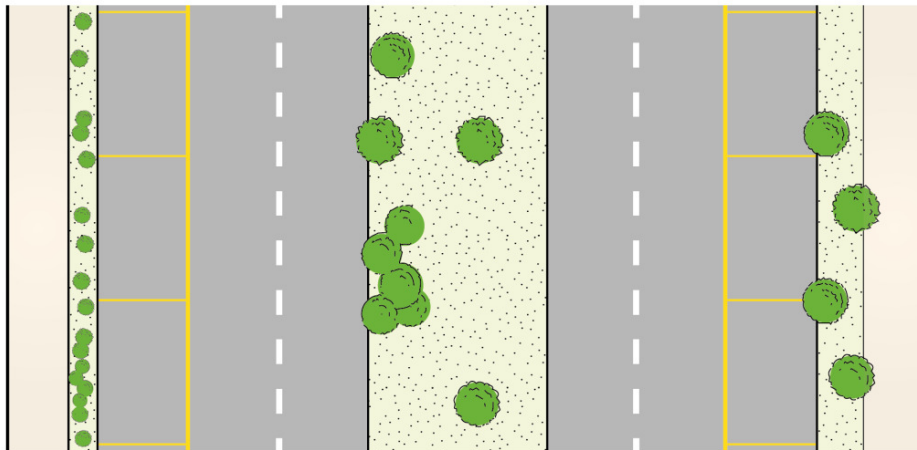
Figure 6-10: Schematic view of the integration of cycleways in existing road profiles.

It is noteworthy that in 2006 the General By-Law of Urbanism and Constructions was modified to include 'guidance' on where cycleways should preferably be located. Article 2.3.2 establishes profiles for each road type, including the appropriate cycleway type (visually or physically segregated). The modification adds the following sentence at the end of the article: 'Cycleways will be permitted in all existing roads, while they must preferably be located in the space of the sidewalks.'[11] The genesis of this modification would require more research, but it might be interpreted as an expression of concern about the wave of cycleway projects in that time which started with the international funding of the GEF project. These new cycleway projects experimented with designs and locations and for the first time infringed on the space of the car, for example in Antonio Varas where the parking lane was eliminated for the cycleway. The decision which mode of transport will lose space to the cycleway is relevant at the planning stage and is a question of political priorities, as we will see later in this chapter.

6.1.4 Summary

Cycleways can be categorised according to the degree of segregation (none, visual or physical) and their location (on the sidewalk, the carriageway or the central median) and according to which mode of transport loses space (space can be taken from the sidewalk, the carriageway, or the parking lane). Which type of intervention, location and segregation is the best is contested and a question of political priorities.

6.2 Introduction to the case studies

In the following sections I will present four (existing or planned) cycleways as case studies. The selection of the case studies followed a purposive sampling strategy (see chapter 4) and each case study allows an insight into different challenges of the planning and design process. While each cycleway has its individual history and was shaped by a unique constellation of circumstances, common themes emerged from the data, which will be analysed in the third part of this chapter.

6.2.1 Pocuro

The Pocuro cycle path is situated on the central median of Pocuro, one of the main east-west traffic arteries through the municipality of Providencia. The municipality is situated to

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[11] Modified by D.S. 284 – official publication on the 20th December 2006.

the east of Santiago Centre. According to the last census in 2002, it had around 121,000 inhabitants and with 198,000 people arriving at the municipality every day it is the second most important travel destination after Santiago Centre. Providencia is among the very wealthy municipalities in Greater Santiago; in fact, it has the second highest municipal income per inhabitant as well as the second highest municipal spending per inhabitant (GORE, 2006).

Figure 6-11: Pocuro, a cycle path on the central median.
Pocuro, Providencia, 27/03/2011. IMG_1954.

The Pocuro cycle path (see figure 6-11) is often referred to as one of the best cycleways in Santiago. The cycle path is straight between intersections, with its comparatively generous width it is relatively wide, and it is surrounded by a landscaped park with lawn and flower beds which make it appear pretty. However, the cycle path has sparked criticism from experienced as well as inexperienced cyclists for the design of the intersections. The cycleway shows the typical problems of cycleways on the central median, namely crossings shared with pedestrians and the obstacle of left-turning cars. However, the criticism mainly refers to low blocks of concrete which force the cyclist into two rapid 90 degrees turns on each side of every crossing (see figure 6-12).
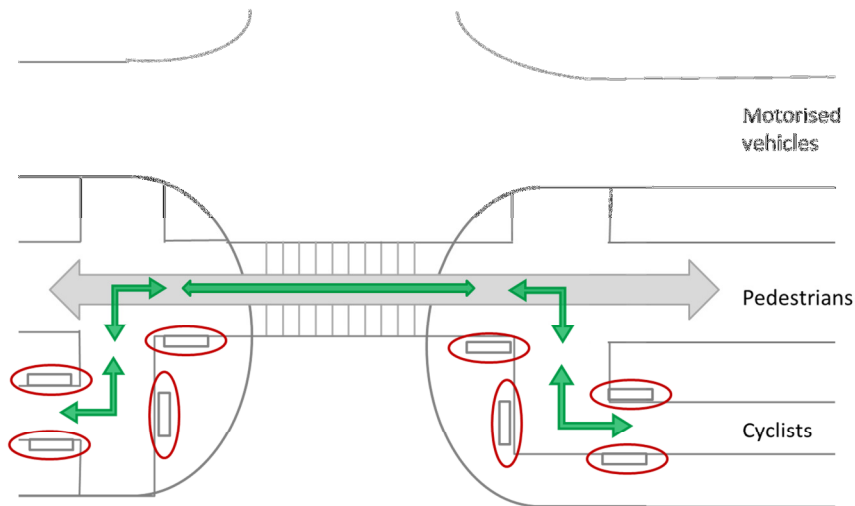
Figure 6-12: Schematic representation of the Pocuro intersections based on an original drawing from the municipality.

These sharp turns force the cyclist to slow down practically to the speed of a pedestrian. While the sharp turns at every crossing are inconvenient for the experienced cyclist, they present a serious difficulty for inexperienced cyclists. The cycle path crosses the municipality from the West to the East and therefore has the characteristic slope. Cyclists going downhill can achieve a considerable speed, while going uphill requires some physical fitness. A forced reduction in speed to almost zero is problematic in both situations. At best, the cyclist loses momentum and is required to start up again at every crossing which unnecessarily costs energy. In the worst case, the cyclist crashes into the low concrete blocks. Inexperienced cyclists can experience difficulties with the sharp turns and, according to a beginner cyclist from the Women's Cycling School, some therefore avoid the cycleway (Interview 26, 14/07/2011). Experienced cyclists could manage the sharp turns, but often divert to the parallel Francisco Bilbao, a five lane avenue with bus traffic and without cycleway, in order to travel at higher speed.

I selected this case study because the divided opinion was intriguing. As we will see below, the differences in opinion are a reflection of the divided understandings of urban (transport) cycling and associated distances and speed.

Figure 6-13: Map of Pocuro (green) in Providencia and Isabel la Católica (red) in Las Condes. Adapted from © OpenStreetMap contributors; data available under the Open Database License (http://www.openstreetmap.org/copyright).
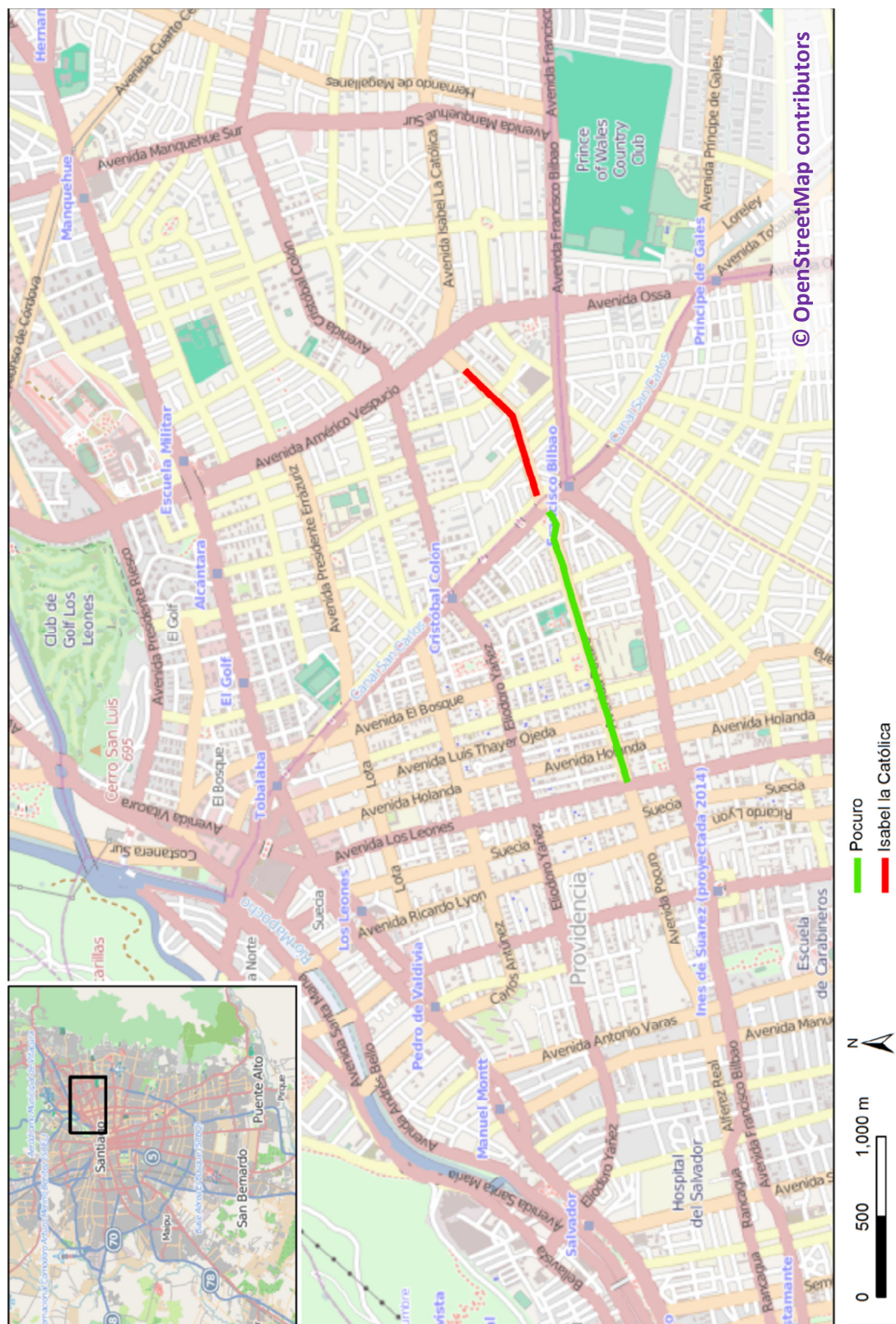
6.2.2 Isabel la Católica

Isabel la Católica is located in the municipality of Las Condes. The municipality is situated to the east of Providencia and stretches to the foothills of the Andes. According to the last census in 2002, it had around 250,000 inhabitants and was expected to grow to 300,000 in 2020. Las Condes is also an important destination with around 150,000 people arriving at the municipality every day. Las Condes is among the very wealthy municipalities in Greater Santiago. In absolute terms, it has the second highest municipal income as well as municipal spending, and the fourth highest municipal income as well as municipal spending per inhabitant (GORE, 2006).

Figure 6-14: Isabel la Católica, a cycle path on the carriageway.
Isabel la Católica, Las Condes, 27/03/2011. IMG_1950.

Isabel la Católica is also among the oldest cycleways in Santiago. It is a cycle path on the carriageway. While the motorised traffic is one-way, the cycle path allows cycling in both directions. The cycle path is wide compared to other cycle paths on the carriageway and physically segregated through delineators, which are set at an angle so that cars cannot cross them although they are relatively low.

Isabel la Católica was voted best cycleway in Santiago in 2007 by the organised cyclists (GORE, Ciudad Viva and I-CE, 2010). However, a local Government official in Las Condes stated that Isabel la Católica was merely "a first idea" (Interview 37, 16/08/2011) and that despite its success further cycleways would not reproduce the design. This decision deserved further research, and part 3 will show that it resulted from a combination of a

prioritisation of motorised transport, the aim to regenerate the public space of the sidewalks and a general belief in the requirement to protect cyclists from motorised traffic by locating cycleways on the sidewalk.

6.2.3   Las Perdices

The Las Perdices cycleway project spans four municipalities adjacent to the Andes from North to South: Las Condes, La Reina, Peñalolén and La Florida. The four municipal budgets differ considerably. The annual municipal income and spending per inhabitant of La Reina was roughly double and of Las Condes roughly 5.5 times as much as of Peñalolén and La Florida (GORE, 2006). These differences reflect the average income situation of the inhabitants of the respective municipalities.

The cycleway project is especially useful because it is the first continuous connection of the four municipalities in the East where the Andes start at an elevation of approximately 720 to 723m over sea level. It remains at the same elevation over the whole extension of 13 kilometres, which makes it extremely useful for transport cycling between the municipalities. The National Census data show that there is a considerable amount of people who live in La Florida (11,500) and Peñalolén (9,100) who commute to Las Condes on a daily basis (GORE, 2006: 55). Because at the time of the fieldwork there was no connection of the municipalities on the side of the Andes, commuters had to cycle downhill to the west, then across to Las Condes, and finally uphill again into the municipality. This takes considerable amount of time and requires high physical fitness. With the new cycleway adjacent to the Andes, the slope on the commute could be avoided and the route could be considerably shortened. Additionally, the cycleway would have a high recreational value, by providing a scenic cycle ride with impressive views over the city and by linking directly to trails into the Andes.

Figure 6-15: Las Perdices, a cycle path segregated from motor traffic by a park, but mostly open to spill-overs by pedestrians; at the far end the asphalt pavement turns into compacted sand.
Las Perdices, La Reina, 01/05/2011. IMG_2104.

The project was initiated by the foundation of an association which owns the rights to the water of the river Maipo (*Sociedad del Canal del Maipo*), which has jurisdiction over the strip of land over the subterranean canals. The foundation contracted the architectural firm Montealegre Beach Arquitectos to design the cycleway for all four municipalities. Until the time of the fieldwork, however, only the stretch in La Reina had been built. In Peñalolén, the design has been submitted for funding, and construction was expected to start soon. The delay had been due to the fact that part of the road Las Perdices had not been constructed and required several politically sensitive expropriations. Only with the road a cycleway could be added. In La Florida, the interest in this particular cycleway seemed low. Cycleways more to the centre of the municipality were of higher priority. Cycling was seen as mode of transport for small distances within the municipality; a commute exceeding 10 km to Las Condes was not seen as realistic option for a sufficient amount of people to justify a prioritisation. Finally, in Las Condes the Las Perdices project was seen as the responsibility of the GORE. As the cycleway would primarily benefit the commuters from other municipalities, the municipality could not justify the expense. With Las Condes being the main destination for work commutes, it was clear that the cycleway would only produce its full social benefits with the completion of the part in Las Condes. Therefore, Las Condes was strategically waiting for the GORE to provide the funding.

I selected this case study because network infrastructure such as a cycleway system only realises its full benefits through connectivity of the individual elements. The Las Perdices case gives insight into the challenges of coordination in view of different municipal realities and political agendas. This case points to the lack of a central body which coordinates the activities of the municipalities when it comes to networked infrastructures. This will be further discussed in part 3 of this chapter.
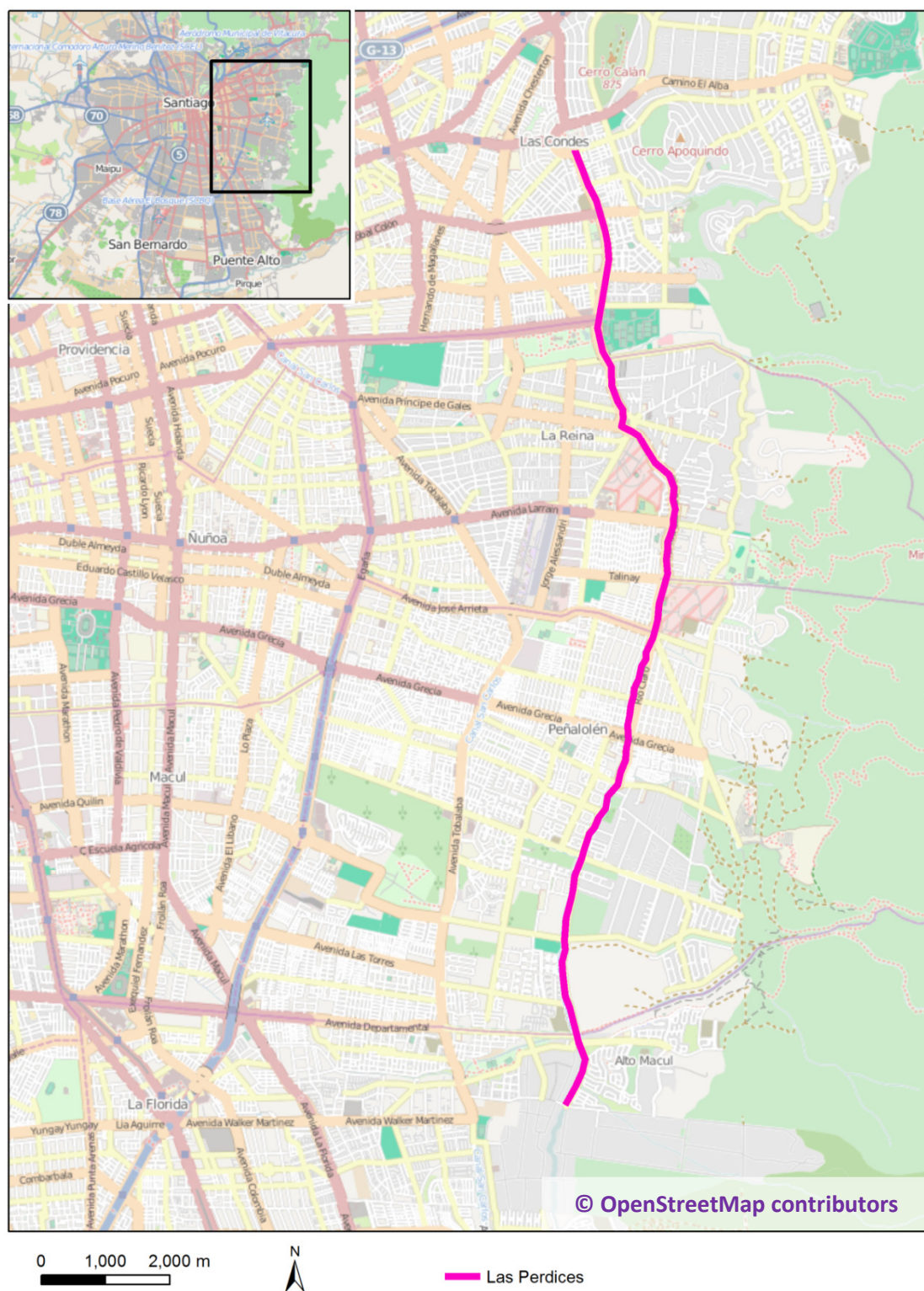
Figure 6-16: Map of Las Perdices, spanning Las Condes, La Reina, Peñalolén and La Florida.
Adapted from © OpenStreetMap contributors; data available under the Open Database License
(http://www.openstreetmap.org/copyright).

6.2.4 Clotario Blest

Clotario Blest is one of the main avenues in Pedro Aguirre Cerda, which is situated to the south-west of Santiago Centre. The municipality has 115,000 inhabitants. It does not receive a significant influx of commuters, but approximately 9,800 people commute daily to Santiago Centre (GORE, 2006). Pedro Aguirre Cerda is one of the poorest municipalities close to the city centre. It has approximately one seventh of the municipal income as well as municipal spending per inhabitant of Providencia (ibid.).

In this neighbourhood, cycling is a normal mode of transport for the commute to work or other utility trips. Clotario Blest is one of the main North-South traffic arteries through the municipality and also a bus route. However, the carriageway of Clotario Blest is relatively narrow with only one lane in each direction. Next to the carriageway, there is a broad strip of wasteland (see figure 6-17). Where there are residences, small squares have been converted into front gardens. Most of the space is empty, however, and is used for irregular parking in front of local businesses. As it is not paved, driving produces dust throughout most of the year and in winter rain converts this space into a muddy landscape. Finally, household waste materials accumulate in some areas, which attract stray dogs and possibly other pests.

Figure 6-17: Clotario Blest: wasteland which is mainly used for parking and misused for fly-tipping. The regeneration project includes a cycleway.
Clotario Blest, Pedro Aguirre Cerda, 19/08/2011. IMG_2325.

The Clotario Blest project is aimed at the regeneration and regularisation of this urban public space. It spans 3.4 km and is an investment of approximately £3.25 million. Providing adequate infrastructure for the mode of transport which is commonly used in this municipality is one of the goals of the mayor at the time of the fieldwork. Apart from a

cycleway it also includes, parking for bicycles and cars, landscaping, lighting, fitness equipment and space for other activities such as temporary local markets. I selected this cycleway because on the one hand cycling is normal in Pedro Aguirre Cerda, on the other hand this was an unusually costly and extensive project for a municipality with the resources of Pedro Aguirre Cerda.
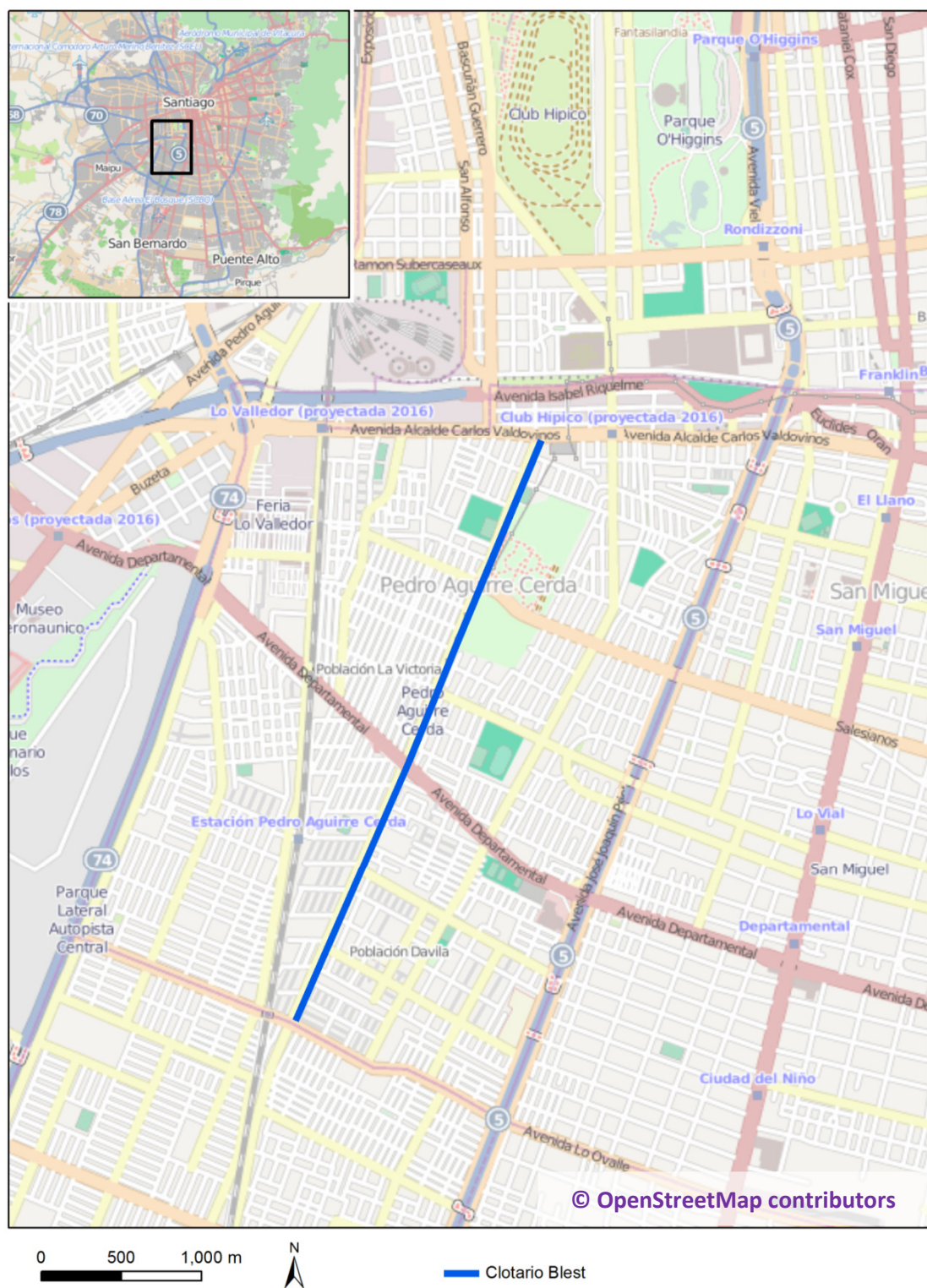
Figure 6-18: Map of Clotario Blest, Pedro Aguirre Cerda.
Adapted from © OpenStreetMap contributors; data available under the Open Database License
(http://www.openstreetmap.org/copyright).

6.3   The planning and design of cycleways

This part of the chapter will use the data from the case studies to analyse the planning and design of cycleways. I will argue that the planning and design of cycleways is an inherently political process which reflects the conflict between driving and cycling and the current prioritisation of private motorised transport in urban planning.

In the first section, I will present five myths about urban transport cycling and show how they shaped specific cycleway designs. Most cycleways in Santiago show design deficiencies which seriously obstruct the performance of transport cycling. I will argue that the design of cycleways is significantly shaped by the myths about cycling which reflect the dominance of driving in the urban transport system in Santiago.

In the second section, I will identify four relevant actors in the planning process, their respective problems as well as solution strategies with regard to the planning and design of cycleways. I will show that the responsibilities for the steps of the planning process are divided over several government bodies. This fragmented institutionality of cycleway planning allows key technical units within the Ministry of Housing and Urbanism and the Ministry of Planning to continue prioritising car flow over other modes of transport, which impacts on the entire planning and design process.

The third section will focus on two processes of negotiation: the 'civil society – government round table' and the revision of the design manual for road infrastructure. I will argue that these political negotiations can be interpreted as attempts to resolve conflicting approaches to infrastructure planning and to stabilise the practice of cycleway planning and design.

6.3.1   The myths which shape the design

During the fieldwork, I found good cycleway design which was not reproduced (Isabel la Católica) and dysfunctional cycleway design which had become the prototype of 'high standard' design (Pocuro). Often these deficiencies were explained by the lack of expertise within the planning authorities. In this part of the chapter, I will try to unpack this notion of 'lack of expertise'. I will argue that there are myths about cycling and cyclists which significantly contribute to producing suboptimal design results. Marvin and Guy (1997) introduce the notion of myth as a form of narrative which frames the way in which problems are viewed. The authors clarify: 'Critically, our use of the word 'myth' does not

suggest that the discourse is a form of fiction or untruth. Instead the concept of a myth is used to represent narratives that concretely frame the way in which environmental problems are conventionally viewed' (1997: 312). I will argue that the five myths, which I will present in the following sections, are constructed and reproduced by the urban transport system, centred on the practice of driving, and upheld by road infrastructure which prioritises car flow over all other modes of transport.

6.3.1.1 Cyclists need to be protected from motor traffic

Maybe the most fundamental belief which shaped cycleway designs in Santiago in 2011 was that cyclists needed to be protected from motor traffic. The general justification was that there was no 'culture of respect' between the participants in urban traffic. Dangerous driving was mostly viewed as a given. Consequently, strategies were employed to separate cyclists from this source of danger.

An example for the need to protect the cyclist is the general agreement that cycleways should be built on the sidewalk or the central median, well segregated from motor traffic. This is often based on a complex combination of political pressures, myths, and a lack of expertise. Two officials of a local planning secretariat justified the location of cycleways on the sidewalk:

> Interviewee 1: It's very risky for us to implement that system [of cycleways on the carriageway] as long as there is no culture that says: yes, here bicycles and vehicles will respect one another and cyclists will respect the hierarchy of the vehicle on this road or the hierarchy of the pedestrian on the sidewalk. The cultural aspect associated with the use of the bicycle is still problematic.

> Interviewee 2: As it happens, it is not being ruled out. As soon as there is a cycling culture and respect pedestrian-cyclist, motorist-cyclist, without doubt it will be implemented. But currently we will use the space on the sidewalks, not on the carriageways.

> Interviewee 1: Look, principally this comes from a study which is done by the Traffic Department with regard to the use of the carriageway to implement cycleways. When we consulted them, they disagreed, for the same reason: the accident rates which that [location] implies. (Interview 36, 08/08/2011)

In this quote, the interviewees first mention the political risk of implementing cycleways on the carriageway. The sidewalk is not selected because it is the better location, but because the location on the carriageway is too risky for the municipality. Then, the quote shows an understanding of hierarchies of road users. While on the carriageway the car is positioned

at the top of the hierarchy, on the sidewalk it is the pedestrian. Apart from a lack of knowledge of the Traffic Law, this quote shows an understanding of road infrastructure in which the bicycle has no natural place. The second part of the quote then summarises the first by referring to the lack of cycling culture. This was an omnipresent concept in interviews and a general justification for many design decisions. Interestingly, cycling culture is seen as a dichotomous variable: either it exists or it does not. There was very rarely a concept of *creating* cycling culture by facilitating cycling. The third part of the quote finally refers to a study. As was shown in section 2.1.4.1, scientific work and technical standards can contribute to the normalisation of a practice. Here a study is used as justification for cycleway location, disregarding that the Traffic Departments in most municipalities have their own political agenda, which is predominantly focused on facilitating motorised transport.

Another example is the strategy to slow cyclists down to pedestrian speed at crossings in order to protect cyclists from accidents with fast turning cars. This strategy was implemented on the Pocuro cycleway through sharp turns and low walls. With the hindsight of the ten years since construction of the Pocuro cycleway, an official of the local planning secretariat still evaluated this design as necessary and successful:

> When the cycleway reaches a crossing, it should never be straight. It should have a barrier here, a small wall [...] so that the bicycle would have to do this [*shows the movement through the sharp turns*] because cars go across here and cyclists and cars [...] it's very tempting to go straight over the crossing and here provoke an accident, in which it's always the cyclist who comes out severely harmed.
> (Interview 20, 17/06/2011)

According to this interviewee, the cycleway design, specifically the features to reduce speed, keeps cyclists from the temptation of crossing at high speed where cars might turn and thereby putting themselves in danger. The speed reduction is seen as a measure to protect cyclists and was implemented in further designs in Providencia and has been copied on cycleways throughout the city, amongst others in the new cycleway designs in Las Condes (Interview 37, 16/08/2011).

The fear of cycling based on the perception of traffic risks is widely discussed in the literature (see chapter 3). Forester claims that American bike-safety programmes have produced a general 'cyclist-inferiority superstition' in the population (1993: 510-513) and points to the media representations of cyclists as 'helpless victim[s] of dangerous motor traffic' (ibid.: 504). Forester's work is radical and his categorical opposition to cycleways has

been widely criticised (Furth, 2012). However, his interpretation that US cycleway planning in the 1970s was based on 'the idea that motorists were a superior class whose convenience justified endangering and delaying cyclists' (1993: 536) seems rather appropriate for Santiago in 2011. Similar to Forester's description of US cycleway planning in the 1970s, many planning professionals in Santiago justified dysfunctional cycleway designs with concerns for cyclists' safety. It is not surprising that Forester's (1993) *Effective Cycling* holds great importance within the more radical pro-cycling groups in Santiago.

6.3.1.2 Speed is secondary

The second myth about cycling was that cyclists were satisfied to travel at leisurely speed and that speed was secondary compared to safety and segregation from motor traffic and the attractiveness of the cycleway. The Pocuro cycleway was the first example I found of this myth, but it was confirmed by comments amongst others in La Reina and in the Metropolitan Housing and Urbanisation Service (hereinafter referred to as SERVIU) which carries out technical evaluations of all road infrastructure projects (see section 6.3.2.4).

The Pocuro cycleway is part of a park circuit, is landscaped and includes fitness equipment. Additionally, it slows cyclists down at every crossing (see above). It could appear like a purely recreational cycleway. Therefore, I asked an official at the local planning secretariat:

> VW: When you built this cycleway, what was your vision of cycling. Was it about going for a ride to relax?
> Interviewee: No, no, our intention was … well, going for a ride, yes, right away, but the idea was that hopefully … it would be a real mode of transport. (Interview 20, 17/06/2011)

The local official mentioned that already at that time Providencia was receiving a great amount of commuters and that they were aware that the traffic would get worse. The cycleway was therefore not only seen as a recreational feature, but as an element to promote cycling as a mode of transport in the municipality. This aim seemed to disagree with the inscribed speed reductions at crossings. However, in the course of the interview the local official revealed that he considered Providencia his city, not Santiago. His vision of the city was the provision of all services in all municipalities so that people would not need to spend so much time travelling. As a consequence, transport cycling was conceptualised as intracommunal over short distances and at low speed.

The lack of consideration of beginner cyclists who cannot control their bicycles well enough to make these two sharp turns was due to a lack of expertise. However, the general forced

reduction in speed was intentional because it was based on the two myths that cyclists need to be protected from motor traffic (see above) and that transport cycling includes only short distances which can be travelled at leisurely speed.

I observed that the lack of expertise within local planning authorities was a significant factor in the production of deficient designs. However, that was only one part of the explanation. I also found several times that local urban planners actually knew what cyclists needed and still this knowledge was not applied to new designs. For example, an official of a local planning secretariat had observed cyclists avoiding a cycleway because it had too many obstacles:

> I have stood here, I have seen people in [*name of a cycleway*] riding on the carriageway right next to the cycleway and I have asked them 'Why?' They tell me that the issue is that [the cycleway] has a lot of interference. [...] On the contrary, on the road they resemble the car, so the interference on the road is the traffic light, the same traffic light that the car has. (Interview 16, 30/05/2011)

On that specific cycleway on a main traffic artery through the municipality, some cyclists were choosing to cycle on the carriageway instead of the cycleway. The cycleway was failing in its function. The reasons for this were the many obstacles and curves of the cycleway and the design of the intersections. In this case, the planning professional knew the reasons for this failure, but more recent designs still located cycleways on the sidewalk or in parks where interference is typically higher than on the road.

Speed was also sacrificed in order to achieve desired visual characteristics. An official of a local planning secretariat here referred to a cycleway located in a park:

> There is no zone where you can't access here. So if you ride here, there is always the possibility that the dog may go crazy and bark at the bicycle. So, we always say to the people that although the cycleway in [*name of the cycleway*] allows you a higher speed, they always have to ride carefully and they have to ride with the helmet and they have to have all their stuff with them, that in any case they can come face to face with a child or a person who is jogging (Interview 16, 30/05/2011)

The local urban planner here was aware of the interference produced through the location in a park without segregation from the areas where children play, dogs run freely etc. Again, although speed was mentioned, it was not prioritised.

In conclusion, speed was often seen as secondary either because urban transport cycling was considered only for very short intracommunal distances and therefore high speed was

considered unnecessary or because the integration of cycleways in parks was considered more important.

6.3.1.3   Good cycleways are landscaped cycleways

The third myth I encountered was that good cycleways needed landscaping. An official from the GORE described that the planning of cycleways had been a learning curve and that they needed to change their understanding of cycling from the idea of a recreational activity to a mode of transport:

> For us this was quite a new issue. [...] So, we had to start looking which were the best cycleways, what it was that the cyclists wanted [...] because all we knew was to get on our bicycles on a Saturday or a Sunday and go for a ride with the children or do exercise in the parks. That was our concept of the bicycle. Not as mode of transport. What they made us see is that, no, that what they needed was to get out of the car and to arrive at work by bicycle. So, that was very different to [the concept] that the cycleway should pass through a park or that it should go through the side streets, or that the issue was like, no, let's go by bicycle, but we must have a pretty landscape to look at. No. They told us that, the cycleway, we need it to be straight, as simple as possible, we need to save time. And that has been for us learning a bit about what is really wanted with a cycleway, what is the adequate standard [...]. (Interview 34, 01/08/2011)

According to the interviewee, cycleway planning was a learning process and one of the lessons learnt was that landscaping was not a necessary element of the cycleway. However, later in the same interview when the official compared the standards of cycleways across municipalities, parks and landscaping appeared as criteria of high standard:

> … which makes them richer municipalities. So, the standard which they apply to make their cycleways obviously is high. It includes good width, good pavement, trees, landscaping. When you go to the Southern or Northern sector of the Capital it's not like that. That's a cycleway which is very careless in visual terms as well as standards. (Interview 34, 01/08/2011)

The criteria of 'high standard' are width, surface quality, and landscaping. The aspect of appearance is underlined by the contrast with the poorer Southern and Northern sectors of the city where cycleways were 'careless in visual terms'.

Although, as shown in the previous section, there is local knowledge about the needs of cyclists, in the same interview the official of the local planning secretariat still underlined the importance of parks:

> The sectorial specialist left us without the park for [*name of cycleway*], because he left us with only this and with [*a member of staff in SERVIU*] we will try to get the park and all the rest through a Transantiago project, because *she understands*. She made an important change to SERVIU, because she even included a landscaping specialist in the designs and all that, very important. (Interview 16, 30/05/2011)

The vision behind cycleway planning and design which is intricately linked to the idea of landscaping is criticised by cycling activists, here via the example of La Reina:

> The model of La Reina really is [...] even if they invest, they explicitly link it a lot to landscaping and additional [fitness] equipment. So, behind this there is a complete vision of the bicycle more as recreation, sports, having fun. For me, that is the perspective that is behind this. (Interview 24, 13/07/2011)

This criticism is common and not exclusively targeted at La Reina. The association of cycleways with parks and landscaping is a cross-cutting phenomenon through many municipalities as well as the GORE and SERVIU.

6.3.1.4 Drivers won't respect cyclists' space

Linked to the issue of 'culture' mentioned above, I found a general belief that drivers would not respect cyclists space unless it was physically segregated. In Pedro Aguirre Cerda a member of the local planning secretariat explained that a problem of the recommended width of cycleways was that cars could enter the cycleway:

> Today, what is the problem of a cycleway – well, that is the argument that SERVIU or others give us – of having a cycleway which is that wide? That in the end cars will invade and circulate there, that it basically becomes a road. So, that is one variable that today the respect for the space of the cyclist has not been internalised. (Interview 41, 18/08/2011)

As this quote shows, this is originally a concern of SERVIU. Because in the case of the Clotario Blest project SERVIU designed the cycleway, this myth was transferred from SERVIU into the municipality.

A car driving in a supposedly segregated cycle paths is not an everyday occurrence, but it happens and causes considerable fear in cyclists. During my fieldwork, I encountered two victims of such manoeuvres: an experienced young male cyclist who came face-to face with a car in Blanco Encalada (see above) and a retired lady and beginner cyclist who suddenly heard a car behind her on a cycle path on the central median of Presidente Errázuriz. The young man was still affected when I saw him 20 minutes later and the lady reported that it had given her an enormous fright and also made her nervous and insecure on her bicycle.

The strategy of La Reina is to put low bollards at the entrances and exits of cycle paths at every crossing (see figure 6-19). Although bollards are not as such bad and for example widely used in The Netherlands, the low and rather inconspicuous bollards used here can present a dangerous surprise and can additionally exclude tricycles and bicycles with trailers. This was confirmed by a cycling activist who called them "extremely dangerous" (Interview 24, 13/07/2011).

Figure 6-19: A bollard, a rather sharp curve and a steep curb cut require a considerable reduction in speed from the cyclist.
Las Perdices, La Reina, 01/05/2011. IMG 2112.

6.3.1.5 Pocuro as prototype of 'high standard' design

The last myth I will discuss here is the belief that Pocuro represents high standard design. The Pocuro cycleway is often used as example of high standard cycleway design local planning officials who justify their designs by referring to Pocuro.

Partly, this can be explained by the impact this cycleway had when it was built. As was shown in the previous chapter, the stigmatisation of cycling was significant. In order for cycling to be acceptable in a wealthy area, the poverty stigma had to be removed. This was achieved by a design which stood out at the time. Until today, Pocuro is often referred to as Santiago's first 'visible' cycleway. A member of the Planning Secretariat in Providencia states:

> It was visible because the standard was high. It wasn't some paint on the ground, it was high standard […] and that is what was intended, because note that this is a municipality of the higher middle class, especially these sectors here. So, the

bicycle was stigmatised by the people, the bicycle was for the waste paper pickers, for the people who don't have any money, and this started to change because the style of cycling, it's a more modern group of people who cycle, I don't know, the image of the cyclist changed, and that happened thanks to this cycleway on Pocuro, I believe, which led through an exclusive residential zone of the city. (Interview 12, 17/05/2011)

According to this quote, the Pocuro cycle path was constructed to 'high standards'. This was done intentionally because only a cycleway of high standards, i.e. not painted on the carriageway, but rather built segregated from the carriageway with a certain width and surrounded by landscaping, would be able to remove the stigma and make cycling acceptable in a wealthy area such as Providencia. In turn, the cycleway contributed significantly to an image change of cycling. Through the positioning of a cycle path in an exclusive residential area and the emergence of a new type of cyclist, the image of cycling changed. While the cycle path design was influenced by the disputed image of cycling as transport for the poor, the cycle path in turn shaped the image of cycling.

Because Pocuro had such a strong influence on the image of cycling throughout the city and because Providencia is a wealthy municipality which others often aspire to copy, the Pocuro design could be established as the benchmark for high standard. In this way, despite its glaring design deficiencies, most poignantly discussed as first article of the 'Absurd Cycleways' series (Alejo, 2010), the Pocuro design has become part of the frame of 'optimal cycleways' in other municipalities. This is harshly criticised by cycling activists:

I mean all those stupid curves and the walls and they haven't taken them out, and the treatments of the intersections are ridiculous, right? I mean this is not serious infrastructure. It helps a lot, makes a big difference, but these aren't goals that the city should aspire to, right? These are lessons that we should learn from and really get down to serious stuff. (Interview 28, 18/07/2011)

While this cycling activist recognises the difference the cycleway makes – after all, it is used extensively – the design deficiencies, the curves and walls at the intersections, are criticised. While the interviewee states that Pocuro should rather be a lesson to learn from, the quote confirms that Pocuro has become a reference point, something other municipalities might aspire to copy.

6.3.1.6   Summary

In this section, I have presented five myths about cycling and the cyclist, which appeared throughout the interviews with local planners and architects as well as with officials from

GORE and SERVIU. These myths shape the way urban transport cycling is viewed within the urban transport system and shape cycleway design decisions. Crucially, these myths all contribute to holding driving in place as main and most important transport practice and marginalise cycling to often dysfunctional spaces for cycling. The resulting designs are based on the belief that cycling in traffic is dangerous and unpleasant, that cyclists need to be protected from motorised transport through segregation and that cyclists prefer cycling in parks. Cycling is repositioned as recreational activity linked to parks and fitness equipment. The normality of driving further reduces the belief that cyclists are capable and desire to cycle long distances and at high speed on a direct route, which is crucial for transport cycling. On the other hand, several interviewees confirmed that restricting car traffic was not a politically feasible option. Finally, these myths shaped by the dominant practice of driving obstruct any belief in the potential development of a bicycle culture or the redistribution of space.

6.3.2 Relevant social groups in the planning of cycleways

In this section, I will use the Social Construction of Technology (SCOT) approach (Pinch and Bijker, 1984) to infrastructure development and present the main relevant social groups in the planning of cycleways. According to Pinch and Bijker, relevant social groups can be institutions, organisations, organised or unorganised groups of people. The crucial criterion is that 'all members of a certain social group share the same set of meanings, attached to a specific artefact' (ibid.: 414). I used a snow-balling strategy to identify the relevant institutions and the most appropriate representatives within the institutions, which I then interviewed.

Chile's road infrastructure is regulated by the Construction and Urbanism Law (Chile. *Ley General de Urbanismo y Construcciones D.F.L. N°458 de 1975*, 2013) and the respective By-law (*Ordenanza*). There are four institutions which principally negotiate the planning and implementation of cycleways:[12]

- the respective municipality;
- the Metropolitan Regional Government of Santiago (GORE);
- the Ministry of Planning (MidePlan); and

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[12] This section presents a simplified portrait of the planning process. The planning process is complicated and involves numerous actors. Reducing this analysis to these four main institutions is useful to show more clearly the differences in technological frames, the problems and solution strategies, and resulting conflicts and negotiations.

- the Metropolitan Housing and Urbanisation Service (SERVIU).

The following sections will present the role of each relevant social group in the planning process and their understanding of cycling and cycleways, their 'technological frame'. Following Pinch and Bijker's (1984) approach, I will then turn to the problems of each social group with regard to cycleways and their solution strategies. I will show that cycleway planning in Santiago is carried out by multiple actors with different technological frames, problems and solution strategies. This fragmented institutionality of cycleway planning holds in place the prioritisation of the car through the economic and technical evaluations of cycleway projects.

6.3.2.1 The municipalities

The construction of cycleways on urban roads is generally planned and designed at the local level. The creation of adequate conditions for cycling has been a demand from the population for years. It is also a priority of the GORE and a presidential commitment. However, the municipalities face considerable obstacles in the planning and design of cycleways.

First, most municipalities do not have sufficient financial resources for infrastructure interventions. Mostly, municipalities rely on the National Fund for Regional Development (hereinafter FNDR) for the funding of their projects. This can be a long and onerous process. Additionally, cycleways are in direct competition with other municipal projects because each municipality has a set amount of FNDR funding for all of its projects. The municipality has to set priorities, which, according to an official of the GORE, for example seldomly favour a cycleway over a first aid station (Interview 34, 01/08/2011). Finally, the distribution of FNDR funding follows its own logic, partly based on political priorities of the GORE which do not necessarily fit with the priorities of the municipalities.

Solution strategies are varied. Some municipalities find funding with international development organisations, for example Peñalolén. In another municipality, I was told that in the past a cycleway project had been submitted to the FNDR as a park project, which happened to include a cycleway, because green spaces were a regional priority. While this adaptation of the project to regional priorities secured the funding, it can cause suboptimal design results and/or waste resources.

Second, the Planning Secretariats are generally under pressure not to touch car traffic. In view of severe traffic congestion and also in view of the fact that cars generate income for

the municipalities (through registration and license fees etc.), it would be very difficult to incentivise cycling at the cost of the car. Furthermore, certain cycleway designs, specifically cycleways on the carriageway, are seen as too dangerous because of the proximity to motorised traffic. Cycleway projects of this type can be risky because accidents could be blamed on the municipality (see section 6.3.1.1). In Las Condes and La Florida for example the solution was a rather categorical rejection of cycleways on the carriageway.

Third, the administrative burden of the planning process is high. In order to be able to secure FNDR funding a cycleway project needs a technical approval by the SERVIU and an economic approval by the Planning Ministry, both of which require considerable amounts of preparation.

In general, municipalities follow the design recommendations for urban road infrastructure approved by the Ministry of Housing and Urbanism, the host institution of the SERVIU, so that their designs will receive approval. Some municipalities cooperate directly with SERVIU on the design, as in the case of Clotario Blest. Also, La Reina offers guidance to other municipalities on how to get cycleway projects through the administrative process. It is notable that the design of cycleways was mentioned only very few times in all the interviews with local Planning Secretariats which are responsible for the design. Although the design requires specific technical expertise which is often missing, especially in less wealthy municipalities with smaller urban planning teams, the interviewees were generally more concerned about the administrative process.

Fourth, cycleways are sometimes viewed as politically risky projects. Mayors are elected locally and are therefore sensitive to the pressure from residents. Although there is considerable demand for adequate conditions for cycling, which generally means cycling infrastructure, there is often considerable opposition from the residents. This was mentioned by the interviewees of the local planning secretariats in Providencia, Las Condes and Pedro Aguirre Cerda (Interviews 20, 17/06/2011, 37, 16/08/2011 and 41, 18/08/2011), municipalities of very different cycling situations. Often this opposition develops because residents lose the possibility to use their driveways for parking, for example in the case of Pocuro, or because they fear an impact on the access to local businesses, as in the case of Clotario Blest. Finally, as the provision of cycleways is even contested among cyclists, criticism can be expected by the intended beneficiaries.

Different municipalities take different approaches to reduce the risk associated with a cycleway project. In Las Condes a great effort was made to inform the residents of the project and convince them; in several municipalities cycling organisations were consulted during the design process, although the effect of the consultation in terms of cycleway design was limited.

Fifth, municipalities can only plan on their territories, but most are aware that their cyclists would benefit from connectivity in the network at the boundaries to other communities. As a solution, municipalities have formed collectives, such as 'Ciudad Sur' (Southern City), a collective of 10 municipalities in the South of the city.

6.3.2.2 GORE: Agenda 10 and the FNDR funding mechanism

Rather unusual for a city of this size, Greater Santiago has no city administration, nor a mayor. Because the Metropolitan Region is dominated by the city of Greater Santiago, the GORE is closest to a government for the city. The head of the GORE, the *Intendente*, is not locally elected, however, but appointed by the President of the Republic of Chile. Changes of the *Intendente* are frequent and follow political affiliations.

The vision of the GORE is expressed in the Agenda 10, which mentions air pollution/smog and traffic congestion as major problems of the city and the promotion of cycling has been a declared goal since 2007. In theory, the FNDR funding mechanism is how the GORE can set priorities and push forward on city-wide goals. However, there are several pitfalls in this funding mechanism.

First, the members of the Regional Council, who select the projects which will be supported, represent the political parties proportionally. Projects are therefore approved in a tit-for-tat style where every political party receives some projects which represent their priorities. According to the criticism from a member of civil society, technical quality and economic and social profitability are secondary in this decision-making process (Interview 28, 18/07/2011).

Second, because the municipalities submit the projects they have prioritised, the GORE can only select some of these small projects, not push forward city-wide initiatives, nor influence the design to establish coherence in the cycleway network, nor influence the choice of road for the cycleway in order to guarantee connectivity in the network.

A major step to solve these problems was the elaboration of the map of cycleways in the Cycle Route Master Plan (see section 5.2.5). Municipalities participated in the elaboration of the plan and could bring forward local priorities, which were then coordinated. New cycleway projects are supposed to follow the network set out in the Master Plan.

A second solution strategy is a change in legislation. At the time of the fieldwork, there was no possibility for several municipalities to apply jointly to the FNDR for example for an intercommunal cycleway such as Las Perdices. This was being addressed by the GORE with a change in legislation during the fieldwork.

6.3.2.3 Ministry of Planning: Economic evaluation of transport projects

Every road infrastructure intervention has to pass an economic evaluation by the Ministry of Planning (MidePlan). According to an official from MidePlan, MidePlan principally aims to secure the best use of public funding, by contributing a 'solid' socio-economic evaluation of benefits as basis for a political decision (Interview 40, 17/08/2011). In the interview, the economic evaluation was explicitly distinguished from 'subjective' political prioritisations (Interview 40, 17/08/2011). The evaluation was seen as a technical exercise, which should then be followed by a political selection of the best alternative. Therefore, MidePlan as such did not have a particular technological frame for cycleways nor a vision for the urban transport system, and the interviewee distanced their role from that of the architects who focused on the city, wanting "to make it pretty" but did not carry out evaluations (Interview 40, 17/08/2011).

For a long time, cycleways had been treated as additional costs to road infrastructure (Interview 40, 17/08/2011). At the time of the fieldwork, their benefits were taken into account in the evaluation. However, the evaluation was based entirely on the benefits of cycleways in reducing travel times for motorised transport through the elimination of 'friction' between bicycles and cars, which obstructs car flow (Interview 40, 17/08/2011). A new evaluation methodology was being discussed with the Ministry of Transport and Telecommunications.

An additional problem for MidePlan is that the benefits of cycling are distributed over multiple sectors, such as environment, public health, transport etc. Although an internal report on the evaluation of cycleways acknowledged these benefits, they were not taken into account in the socio-economic evaluation. According to the MidePlan official, a transport project needed to be profitable in terms of transport (Interview 40, 17/08/2011).

This general tendency in Chilean bureaucracy to sectoral thinking was criticised in several interviews with former government officials (Interviews 25, 13/07/2011 and 38, 16/08/2011).

6.3.2.4   SERVIU: Technical evaluation of transport projects

Every road infrastructure intervention has to pass a technical evaluation by SERVIU. The SERVIU is part of the Ministry of Housing and Urbanism (hereinafter referred to as MINVU).

In SERVIU the vision for transport cycling in the urban transport system was rather limited. When asked generally about the vision of SERVIU, the official first spoke at length about public transport and about integrating the new Transantiago corridors into the urban fabric so that they would not act as dividers. Non-motorised transport was only addressed when prompted. Interestingly, the purpose of transport seemed to be insufficient to justify a cycleway. According to the SERVIU interviewee, a cycleway should always also serve recreational purposes (Interview 42, 22/08/2011). Additionally, integrating cycleways into existing road profiles was seen as a problem due to the insufficient space (Interview 42, 22/08/2011). In general, the views presented in the interview reiterated several of the myths presented above, most importantly the need to protect cyclists as well as the great importance of landscaping.

SERVIU's strategy for the technical evaluation seemed to rely heavily on the REDEVU design manual. Although the manual only consists of design recommendations, it is very difficult to achieve approval for a project which does not follow the designs outlined in the REDEVU. However, in the version valid in 2011 cycleways are barely mentioned (Ministerio de Vivienda y Urbanismo, 2009) and the designs mainly aim at facilitating car flow and thereby reducing traffic congestion. A revision proposed by the Secretariat of Transport Planning (hereinafter referred to as SECTRA) included cycleway designs. However, the revision has not been approved by the MINVU (see section 6.3.3.2) and could therefore not officially be taken into account in the evaluation. In the interview, the SERVIU official stated that the designs of the revised REDEVU which appeared 'logical' or 'common sense' were to some extent taken into account, but that they had to wait for the official approval by MINVU.

SERVIU was consistently and severely criticised as inflexible, obstructive and incompetent by officials from municipalities, the regional level, and by cycling activists who worked on cycleway planning and design. Innovative cycleway designs, especially designs which

prioritised cycling over driving, were commonly rejected by SERVIU. In the next section, I will present a political struggle between MINVU as host institution of SERVIU on the one hand and SECTRA and the civil society organisation *Ciudad Viva* on the other hand to establish design standards in the REDEVU in order to resolve this obstacle in cycleway design.

6.3.2.5   Summary

In this section, I showed that the responsibility for the planning of cycleways is divided among four relevant social groups all of which face specific problems with regard to their role in the planning process and follow individual solution strategies. The main challenge of most municipalities is the need to apply for funding and the need to balance competing demands (from cyclists, local residents and businesses, from their financial administration which needs the income from the cars etc.). The GORE is the closest to a government for the city but is limited in its power to act as such because infrastructure is mainly planned and designed at the local level. MidePlan and SERVIU both carry out evaluations. MidePlan aims to distance the socio-economic evaluation from political decisions. However, work on the methodology is ongoing and requires political decisions such as which benefits should be taken into account. The reduction in travel time for motorised transport as sole criterion for the analysis of benefits of cycleways significantly underestimates the social benefits of cycling. Finally, SERVIU carries out a technical evaluation. The technological frame in SERVIU is significantly shaped by the myths that cyclists need to be protected and that cycleways require landscaping. The lack of expertise in cycleway design combined with the lack of guidance in the REDEVU, which is mainly focused on facilitating car flow, significantly limits the possibility of innovative design solutions, especially when they aim at reducing the speed of motorised transport. Cycleway planning is therefore faced with an onerous funding mechanism as well as two evaluation processes which underestimate the benefits of cycling and prioritise car flow and travel time of motorised transport.

6.3.3   Political negotiations of solution strategies

This section will focus on how the relevant social groups negotiate their solution strategies with one another. Pinch and Bijker argue that following solution strategies brings forward all kinds of conflicts: different social groups might establish conflicting technical requirements for the artefact in order to solve their respective problems; social groups might propose different solutions to a joint problem; or different understandings might

produce moral conflicts as to the use of a technology (1984: 415-416). The following sections will focus on two political negotiations centred on such conflicts between the relevant social groups.

The first section will focus on the struggle to standardise cycleway planning in the 'Civil Society – Government Round Table'. I will argue that this process was more than the elaboration of a map of cycleways, but rather an encounter of the involved institutions and the negotiation of the rules for cycleway planning. The second section will focus on the struggle of updating the REDEVU design manual. While the old REDEVU barely takes the bicycle into account and is targeted mainly at facilitating car flow, the proposed REDEVU update fundamentally changes the role of the bicycle. I will argue that this struggle is an expression of the attempt to standardise cycleway design and thereby to stabilise the role of cycling in the urban transport system.

6.3.3.1 The 'Civil Society – Government Round Table'

As described in chapter 5, between 2007 and 2010 the GORE collaborates with a Dutch consultancy I-CE and *Ciudad Viva*, a civil society organisation, to lead the elaboration of the Master Plan of Cycle Routes of the Bicentenary (*Plan Maestro de Ciclorutas del Bicentenario*) in a multi-stakeholder process (GORE, Ciudad Viva and I-CE, 2010).

An element of this work was the 'Civil Society - Government Round Table' (*Mesa Ciudadanía - Gobierno*) which was founded in 2008 and included key government bodies from the local, regional and national level involved in the planning of cycleways and numerous civil society organisations. This short section cannot do justice to the many activities carried out over three years by so many involved institutions. Amongst many others, this collaboration included capacity-building for cycleway design led by the Dutch consultancy aimed at establishing coherent design standards throughout the city; the elaboration of an actual map of a cycleway network for the entire city in which local priorities were coordinated with city-wide planning objectives and the needs of cyclists; the elaboration of an urban design manual which later fed into the revision of the design manual for urban road infrastructure (see next section); and a work group on legislation and public policy.

In view of the different technological frames, problems and solution strategies of the individual relevant social groups discussed in the previous section, this collaborative process can be interpreted as negotiation between the relevant social groups and as

'closure mechanisms' in order to reach a 'stabilisation' of cycleway design across relevant social groups (Pinch and Bijker, 1984: 424-425). According to a former member of the GORE, who was central in the organisation of the collaboration, the arrival of the international experts had two principal effects: it gave the events a certain status which contributed to securing participation of all the involved institutions, and the international experts had a certain authority to present design standards (Interview 5, 08/04/2011). The capacity-building by the Dutch consultancy as well as the elaboration of a design manual were attempts at 'closure' of cycleway design negotiations through the creation of *shared* standards of cycleway design across relevant social groups.

In terms of the broad participation, this effort can be interpreted as 'configuring connections' in the sense of Shove, Pantzar and Watson's (2012) fourth policy approach. Shove, Pantzar and Watson argue that 'policy makers have an obvious role in bringing existing actors together […] as part of a deliberate strategy to reconfigure the character and the distribution of the elements of which more sustainable practices could be made' (2012: 161). Apart from producing tangible outputs, such as the map or the design manual draft, the success of the collaboration was seen by the former official of the GORE in the face-to-face encounter of the participants at the events and the exchange between the involved institutions (Interview 5, 08/04/2011). For example, at the events local planners met officials from the Planning Ministry who carried out the economic evaluations of their projects. Problems of the planning process could be discussed and this resulted in an improved mutual understanding of problems and solution strategies. According to the former official of the GORE, the event thereby became a 'catalyst' (Interview 5, 08/04/2011) for further cooperation between different government institutions as well as between government and civil society.

6.3.3.2   The REDEVU revision

A fundamental element in the technical approval is the REDEVU design manual, which lays out best design recommendations for constructions in the public space. Although not binding, the REDEVU is used by the municipalities as reference point and basis for designs and by SERVIU as basis for approval and, therefore, has great weight. The REDEVU is developed by the MINVU. The first version of the REDEVU dates from 1984 and includes barely any guidance on cycleway design apart from the differentiation of cycleways according to the level of segregation and standards as to the required width of a

cycleway.[13] In 1992, the Secretariat of Transport Planning (hereinafter referred to as
SECTRA) of the Planning Ministry[14] proposed an update, but this was not approved by
MINVU. In 2009, MINVU updated the first version (Ministerio de Vivienda y Urbanismo,
2009). However, the update consisted mainly of a digitalisation of the original document
and did not generate major changes. Therefore, at the time of the fieldwork, infrastructure
interventions in Santiago were still based on knowledge from the 1980s.

In the second half of the 2000s, both SECTRA and *Ciudad Viva*, invested much effort to
create new standards for cycleway design. *Ciudad Viva* carried out international research
on design standards and collaborated with the Dutch consultancy I-CE (which had
accompanied the process of the Cycle Route Master Plan between 2007 and 2010). Based
on the Dutch design manual, *Ciudad Viva* elaborated a translated and adapted version for
Chile.

SECTRA elaborated a substantial revision of the REDEVU in parallel to the MINVU update.
Interviews diverged on the question whether this was agreed between the two
government bodies, but according to a former SECTRA official involved in the process,
SECTRA carried out extensive research and numerous consultations, including other regions
of the country and multiple civil society organisations (Interview 25, 13/07/2011). With
regard to cycleway design, SECTRA received and included the complete work by *Ciudad
Viva*. In 2010, SECTRA proposed a completely revised version of the REDEVU (SECTRA,
2010). According to the former SECTRA official, this revised document did not only present
new and revised design standards, but also included a new integrated approach to the
distribution of public space between modes of transport (Interview 25, 13/07/2011).
However, at the time of the fieldwork in 2011, MINVU had still not approved the proposed
revised REDEVU and a former member of the respective unit in the MINVU argued that the
level of detail in the proposed revision was inappropriate and that it was not for SECTRA to
present a new version (Interview 38, 16/08/2011).

Although the REDEVU appears rather inconspicuous and the design standards are not
legally binding, it is a central element of design practice in Santiago and the conflict over
the revision of the REDEVU design manual is significant. It does not only illustrate an

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[13] The requirements for cycleway width were mostly circumvented by calling cycleways 'recreational
paths' (pistas recreativas) which were not defined in the REDEVU design manual and therefore did
not require a certain width.
[14] For the period of time described here SECTRA was part of the Planning Ministry. In 2011, SECTRA
became part of the Ministry of Transport and Telecommunications, but it was not clear at the time
of the fieldwork if and how this change would affect this conflict.

ongoing power struggle between MINVU and SECTRA, but also between their two understandings of design practice and of the infrastructure needs of urban transport cycling. In Wenger's language, the REDEVU is a reification of design practice (1998: 57-62). By reification, Wenger means a process of congealing experience of a practice into a material object (ibid.: 58). The manual emerges from design practice and sets standards which in turn are taken into account in the design practice. Wenger argues that reifications are evocative shortcuts and as such can be very powerful (ibid.: 61). As basis for the technical evaluation of SERVIU, the REDEVU plays a role in every construction in public space and is therefore extremely influential. Wenger also warns that '[t]he power of reification – its succinctness, its portability, its potential physical persistence, its focusing effect – is also its danger' (ibid.) because the process of reification creates a concreteness which can hide conflicts (ibid.). The REDEVU sets standards where there is no consensus. The authors of the REDEVU are powerful because they can systematically impose their vision and design standards on all public construction. In the process described here several institutions competed over the authority of setting these standards.

6.4   Conclusion

In this chapter I have traced the politics of the planning and design of cycleways. I first presented a typology of cycleways in order to show the political character of this infrastructure. While cycleways are often seen as an inconspicuous element of road infrastructure, I argued that the provision of cycleways is an inherently political issue. Limited urban space is divided between modes of transport and the retrospective integration of a cycleway removes space from other modes of transport. Where and how cycleways are provided is an expression of political priorities.

Based on the data from four case study cycleways and six respective municipalities, I then focused on the planning and design of cycleways. I argued that the provision of cycleways reflects the competition between urban transport cycling and driving. I first argued that the planning and design of cycleways reveals competing discourses of transport. I explored five myths about cycling and cyclists and showed how they contributed to shaping design approaches. I then turned to four relevant social groups involved in the cycleway planning process. I explored their roles, problems and solution strategies and showed that the four institutions had different technological frames with regard to cycleway infrastructure, shaped in part by their specific role in the planning process and underpinned by the myths I

previously explored. I argued that SERVIU and MidePlan both prioritise car flow due to evaluation methodologies and criteria as well as technical guidelines which form the basis of the evaluations. In the final section I focused on two processes in which cycleway planning and design were explicitly negotiated between institutions. I have interpreted these efforts as an attempt to move towards stabilisation of cycleway development and thereby also as an attempt at stabilising the role of cycling in the urban transport system.

In conclusion, I argued that the competition between the practices of urban transport cycling and driving were expressed in the entire planning and design process: in the myths about cycling, in the technological frames of the relevant social groups in the planning system, in the struggles for standardisation and stabilisation of the planning and design process, in the individual design decisions, and finally in the resulting individual situated experience of cycling (as was shown in chapter 5), which may in turn contribute to shaping the myths. Therefore, providing cycling infrastructure in order to facilitate urban transport cycling may not be the straightforward 'techno-rational' process as which it is often portrayed by transport engineers. In the context of a transport system in which motorised transport is still widely prioritised, the provision of cycling infrastructure may be shaped by and reflect the competitive relationship between urban transport cycling and driving.

Chapter 7: Growing practice

While chapter 6 explored the facilitation of urban transport cycling through the provision of material infrastructure, this chapter will focus on an approach to facilitating cycling, which I will label 'growing practice'. This approach consists of providing targeted support for individual cyclists. I will argue that this small-scale support, which acknowledges the differences between cyclists as well as the different types of performances and resulting needs of cyclists, contributes in a significant way not only to recruiting and maintaining individuals as carriers of the practice, but also to creating a community of practice, which is crucial in the face of the competition through driving.

The first part of the chapter will focus on the practice as performance. It will identify common 'points of failure', i.e. circumstances which inhibit the recruitment of a carrier or which lead to abandonment of the practice. I will focus on four points of failure and will use interviews with cyclists from different backgrounds to show what is perceived as problematic and how the cyclists deal with the adversities. In each section, I will then focus on activities and services by cycling organisations which are targeted at providing support for these problems. I argue that the targeted support for new or inexperienced carriers is able to address issues concerning individual elements of the practice more effectively than catch-all policy measures.

In the second part of the chapter, I will argue that these targeted support activities contribute to creating a community of practice. Based on Wenger's (1998) concept of community of practice, I will argue that the cycling organisations create spaces for mutual engagement, in which they provide emotional support in the face of the risks associated with cycling. Furthermore, the cycling organisations negotiate a joint enterprise and contribute to generating a shared repertoire through educational activities and mobilisations for a common cause. Finally, they reach out beyond the community of practice not only to recruit, but also to shape the image of cycling and contribute to alleviating the conflicts between cycling and driving.

7.1 The cycling organisations

During the fieldwork, I followed the work of eleven cycling organisations, groups or movements.[15] I interviewed members of nine of these cycling organisations, which had been particularly politically active, had had a significant role in the recent history of cycling and/or represented a particular view of cycling. Three cycling organisations allowed me to participate or observe their activities more regularly, which gave me valuable insight beyond the interviews. I will here present the three organisations which I visited most and which thereby became important sources for this chapter, although the interviews with the other organisations were also taken into account and completed the insight.

7.1.1 Recicleta

Recicleta is a group of friends who receive donations of bicycles in disuse and pass them on to people who will use them again, preferably to people who need them for transport and who cannot afford a new bicycle. The Recicleta website states that they aim to stimulate the use of the bicycle as a mode of transport in Santiago because they 'believe that a city with more bicycles is a city with less pollution, less noise and more pleasant for its inhabitants. In summary, a more humane and sustainable city' (Recicleta, n.d.).

The idea for Recicleta originated in a newspaper article which stated that 75 percent of Chilean homes had at least one bicycle. However, many of them are unused, old and/or broken. In some apartment buildings there are piles of abandoned bicycles in the basement. These represent an effectively infinite supply for the group. Several members in the group are excellent bicycle mechanics, and the bicycles are generally repaired so that they can be used immediately by the new owners.

At the time of the fieldwork, Recicleta was not legally registered. All members were volunteers. The materials for the bicycle repairs had so far been funded by the very occasional sale of a donated bicycle which would have been too valuable to give away and of donated spare parts that could not be used in the bicycle repairs.

During the six months of fieldwork, I attended the weekly meetings as well as separate events, for example weekend repair days, roughly once or twice a month. Throughout this

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[15] For the sake of readability, I will hereinafter refer to all organisations, groups and movements of civil society as 'cycling organisations', although not all of them were legally registered at the time of the fieldwork.

time, I had countless in-depth conversations with the members of the group, two of which I additionally interviewed.

7.1.2 Macleta and the Women's Cycling School

Macleta which stands for *Mujeres Arriba de la Cleta* (Women on Bicycles) is an organisation of women who aim to increase the number of women cycling in Santiago. They see the bicycle as a tool to improve the conditions of the city and the quality of life of its inhabitants. Most importantly, they believe in the bicycle as instrument for the emancipation of women by making women visible in Chilean society and thereby challenging traditional gender roles which locate the man in the public sphere and the woman in the privacy of the home. They argue that through providing mobility and independence the bicycle has the potential to contribute to the empowerment of women. Also, they argue that women on bicycles are important for demonstrating to other people that it is safe to cycle in the city and thereby motivate others to do the same, and also for passing this practice on to their children.

Amongst many other activities, Macleta organises the quarterly Women's Cycling School which provides training at two levels: complete beginners can learn to ride a bicycle and women who are able to ride a bicycle can learn how to cycle on the carriageway in a safe and confident way. The course takes place on Sunday mornings over eight weeks and costs CLP 30,000 (approximately £38.00), although there are mechanisms available if someone cannot afford the total amount. Apart from the practical training, the course includes a theoretical session per week, including topics such as the parts and functioning of the bicycle, basic bicycle repairs, health and physical fitness, and traffic rules as well as how to manage typical problematic situations in traffic. Macleta also provides their students with a cycling manual.

At the time of the fieldwork, Macleta consisted of eleven women. All members were volunteers, apart from a small allowance for the instructors of the Women's Cycling School.

I attended a complete course of the Women's Cycling School over eight weeks in March – May 2011 and the first part of the course in July – September 2011. On these occasions, I had the opportunity to speak to the experienced cycling instructors, one of whom I interviewed, as well as the students, three of whom I interviewed.

7.1.3 Pedalea!Beauchef

Pedalea!Beauchef is an organisation of student cyclists at the Faculty of Physical Sciences and Mathematics at the University of Chile who aim to promote the bicycle as mode of transport in their community. They promote cycling as healthy way to relax from the high pressure of the study courses and to counter the sedentary lifestyle produced by the long study hours. Also, they promote the bicycle as an efficient mode of transport in terms of time and money, and as a realistic alternative to other modes of transport.

Pedalea!Beauchef organises various activities and services to promote the bicycle. The main pillar of their work is a student-led bicycle workshop which is their meeting point and hub of activities. Students can use the tools and receive knowledgeable support from volunteers when they need to carry out maintenance or repairs on their bicycles or when they wish to assemble a new bicycle from scratch.

Pedalea!Beauchef also supports student cyclists via an online forum. They aim to disseminate the best cycle routes to the campus via an online map as well as a huge paper map on the wall of the workshop with the routes. They support students who would like to start cycling. Additionally, Pedalea!Beauchef organises collective cycle rides within the city and longer tours outside the city. They lobby for decent bicycle parking facilities at the university, and they were actively involved in the mobilisation of cyclists for the protest rides in April 2011.

At the time of the fieldwork, all members of Pedalea!Beauchef were volunteers and the workshop was open to all students. The organisation had received funding from the university to build up the workshop, but a *semi-annual* membership fee of £0.60 to £2.00 was being discussed to make the organisation financially sustainable.

Throughout the six months, I visited the workshop several times and repaired a bicycle which Pedalea!Beauchef donated to Recicleta. During these sessions, I had various conversations with the workshop volunteers as well as students who arrived at the workshop for support. I interviewed three members of Pedalea!Beauchef.

7.2 Targeted support

The performance of urban transport cycling is not limited to the action of riding a bicycle. While riding the bicycle is the most evident action, urban transport cycling also includes

storing the bicycle at home, finding an adequate route, transporting things, wearing certain clothes, and parking the bicycle amongst others. Furthermore, there are linked practices, such as acquiring the bicycle as well as cycling accessories and doing bicycle maintenance and repairs.

Through my experience of cycling in Santiago and the conversations and interviews with cyclists and non-cyclists, I identified several moments when the practice fails to recruit or maintain carriers. These are acquiring a bicycle, doing maintenance and repairs, learning to ride a bicycle, cycling in urban traffic, and to some extent storing and parking the bicycle. In this part of the chapter, I will focus on the first four of these points of failure (or 'systemic sticking points' as they have recently been termed by Watson (2013)) because these have been addressed by the activities of the cycling organisations. I will first explore where carriers and potential carriers perceive obstacles and then describe the activities and services of the cycling organisations which individually target these obstacles. I will argue that the small-scale personal support is effective because it is targeted at a particular problem of one individual.

7.2.1 Acquiring a bicycle

The first step to practicing urban transport cycling is acquiring a bicycle. There are several ways of acquiring a bicycle. During the fieldwork, I interviewed several students of the Women's Cycling School who described their experience of buying a bicycle, a factory worker who described his experience of borrowing a bicycle from a neighbour and then being given a bicycle by *Recicleta*, and finally two students who assembled their bicycles at *Pedalea!Beauchef*. Additionally, numerous conversations with other cyclists added to this section.

A member of *Recicleta* explains that not only financial reasons keep people from buying a bicycle, but also a variety of uncertainties:

> If you want to buy a bicycle, where do you go? To the supermarket? Bad quality. To a bicycle shop? They will charge you three times as much. You see? Because there is little culture of bike mechanics, because you don't know whom to ask, because you don't understand, because the person who sells you the bicycle will sell you a bicycle that is inadequate for your needs or bad quality ... (Interview 2, 30/03/2011)

This quote points to three issues which can make people feel uncertain about the purchase of a bicycle. First, there is uncertainty as to the best place to buy a bicycle. Bicycles are sold

in the bigger supermarkets, department stores, specialised bicycle shops; used bicycles are sold on local markets and via the internet. Shops are unevenly distributed across the city, with a concentration of bicycle shops on the avenue *San Diego* through Santiago Municipality. *San Diego* is generally known in the population as bicycle avenue and people often go there because they can be sure to find what they need and the competition keeps prices comparatively low. However, according to my observation, the quality of the advice one receives in the shops varies considerably. Furthermore, interviewees mentioned short opening times at the weekends as well as transport of the new bicycle from *San Diego* to the home as problems, especially for people who do not know how to ride a bicycle yet. Slowly, new bicycle workshops are appearing in the other parts of the city so that help is moving closer to the potential cyclists.

Second, there is uncertainty about the personal needs. Different opinions on the adequate height of the bicycle or the necessity of gears for cycling in different parts of the city were examples mentioned in the interviews. Especially beginner cyclists feel safer on small bicycles, but with growing confidence more height is desired in order to be able to pedal efficiently. Purchasing a bicycle requires some technical knowledge and cycling experience either from the person purchasing the bicycle or the sales assistant, but neither is necessarily the case and suboptimal purchases are made.

Third, there is uncertainty with regard to the quality of the bicycle and the individual parts, which results from a lack of knowledge about bicycles and bicycle mechanics. As people have little knowledge themselves, this should be compensated by advice from the sales people, but they are not necessarily qualified either. I encountered very varied experiences in the accounts of beginner cyclists who bought a bicycle. A student from the Women's Cycling School bought her bicycle at a reputable bicycle shop and chose a good bicycle brand. However, after a few sessions at the Cycling School she noticed that braking according to the instructions felt awkward and found out that on her bicycle the sides of the front and the back brake levers had been switched. Finally, months later she learnt that her gear cable was loose. She had noticed that changing gears did not seem to have any effect, but as she did not know how it should feel, she had never asked. Similarly, bicycles are often sold with too little air in the tyres so that cycling requires much more effort. Due to this negligence, beginner cyclists often feel that they are just not fit enough to cycle.

I bought my bicycle in one of the many smaller workshops on *San Diego*. I negotiated some changes with the mechanic, but he seemed barely qualified to do them. On my first longer

trip, I noticed that the back brake rubbed on the mudguard which inhibited the arms from springing back into position after braking. I was extremely concerned about the money I had spent on a bicycle which suddenly seemed dysfunctional. A few days later, I took the bicycle to a *Recicleta* meeting. The group gathered around and a closer look at my bicycle produced general laughter: the bicycle needed some reassembling of parts on the back wheel, a bit of brute force on the mudguards, adjustments of saddle height and brake lever positions, and some more air in the tyres. Then, the bicycle was finally usable. It was my first impression of how dependent a cycling novice could feel in Santiago.

While buying a bicycle can be problematic, there are also people who cannot afford the initial investment to purchase a bicycle. Borrowing a bicycle can be a solution to bridge the gap until purchase. However, borrowing over a longer period of time can cause a feeling of dependence and worries about imposing on other people. A factory worker from Pedro Aguirre Cerda described his time without his own bicycle:

> [It was] quite tragic because I went to him 'Can I borrow your bike?' 'Please, lend me your bike.' It was awful always having to ask for a bike. Then, one day he [a member of Recicleta] came and gave it to me. And here we are. But it's awful always having to ask for things, depending on him, when it's things that … when really you don't have enough [money] to buy one. It's vexing. (Interview 31, 20/07/2011)

In this quote, the interviewee described the period of time when he had to borrow a bicycle because he could not afford to buy his own. The quote clearly shows how difficult it was for this man to continually ask for the favour. His situation changed when he received a bicycle through *Recicleta*, which he used for all utility trips, including his long work commute, and occasional leisure cycling.

Recicleta makes an effort to select recipients who will use the donated bicycles. Anecdotal evidence shows that a cyclist who belongs to a community where cycling is normal or who has cycled before and maybe lost a previous bicycle through theft is more likely to use the bicycle long-term than a person who wants to try out cycling but then after receiving the bicycle realised other hurdles like cycling in urban traffic. Therefore, not all recipients could use the bicycles to the same extent as the interviewee above. For some recipients, their work commute proved too challenging. In this case, old routines for work commutes were continued, while the bicycles were used for more local utility trips.

Pedalea!Beauchef has identified the financial constraint issue. They provide help to students who wish to buy the individual bicycle parts and assemble the bicycle themselves.

That way a considerable part of the cost of a bicycle can be saved. I interviewed two students who had assembled their bicycles at the workshop. Both had made the decision for financial reasons. One of them recalled that he had started with very basic parts and then continued to upgrade as more money came in until now he was gradually stopping because the investments had reached considerable levels (Interview 30, 18/07/2011). However, both interviewees underlined that they felt good about knowing every single part of their bicycles and being able to repair any damage. It seemed that improving the bicycles had become more than a practicality, but rather a hobby which they enjoyed doing and the result of which they enjoyed when cycling fast in urban traffic. In this community, acquiring a bicycle was therefore a long process of changes and improvements rather than a one-off event.

In conclusion, far from a homogeneous practice, acquiring a bicycle requires the negotiation of varying criteria: financial resources, functionality, aesthetics and brand reputation amongst others. The outcome spans a variety of solutions from borrowing a bicycle, buying parts and assembling the bicycle, buying a whole bicycle, used or new, mass-produced or custom-built, in specialised bicycle workshops, supermarkets, department stores or at the local market. While the variety of solutions appears to cater to different people with different tastes and needs, I have found that acquiring a bicycle still goes with significant uncertainties and anxieties. These are produced through a) the variety of places where a bicycle can be purchased under different conditions and the general mistrust in mechanics; b) the lack of knowledge with regard to the criteria for the adequate bicycle; and c) the lack of knowledge of bicycle mechanics and, therefore, the inability to assess the quality of the bicycle. Furthermore, this considerable investment is required at the precise moment when the cycling experience is still low or non-existent. Support in acquiring a bicycle, which takes into account the individual criteria of each person, is a significant contribution to facilitating cycling.

7.2.2 Adjustments, maintenance and repairs

Before the first ride, a bicycle needs to be adjusted to the rider. When it is used, it benefits from regular maintenance. Finally, repairs might become necessary in the case of a puncture or other damage. While anyone can learn to do the adjustments and maintenance tasks, repairs can be more complicated. In general, bicycle mechanics require specialised knowledge and skills, specialised tools, possibly spare parts, expendable materials, and ultimately a disposition to work with tools and deal with dirt and grease.

While many of the activists I met prided themselves on knowing their bicycles in detail (see above), many people, especially women, actually did not know much about bicycle mechanics and needed support. However, according to my observations, going to a bicycle workshop was not the natural response to bicycle failure. A cycling activist explained to me that there is a general mistrust in car mechanics and that this mistrust is projected on to bicycle mechanics:

> You go with your car because there is a noise, and they fix the noise, but they leave another so that you come back later. So, people mistrust mechanics. "I will bring him the bike, I will spend 20 thousand pesos, and afterwards it will be as bad as before." That is what you feel, that is what many people feel. So when you have a bike that needs repair you won't get it fixed because they will mess it up, because you don't have the money, because you mistrust the mechanic. (Interview 2, 30/03/2011)

According to this interviewee, people are not sure that their bicycle will actually be fixed when they go to a bicycle workshop. Spending money and then not being certain that it solved the problem keeps people from going to bicycle workshops.

Instead, my observation was that people had alternative personal support networks. I found a variety of responses to the question of bicycle mechanics. Support was found in family members, friends, neighbours, and often in the concierge of the apartment building. In general, women were not expected to handle tools, so that bicycle maintenance and repairs was the responsibility of husbands, fathers, sons etc. However, not all men knew bicycle mechanics and therefore had to look for support themselves. A concierge in Las Condes told me that he had just repaired the bicycle of a little boy in his building because the father could not do it (Interview 27, 15/07/2011). Similarly, this student supported his uncle:

> My Uncle bought his bicycle here, through the forum, and slowly I helped him fix it up. I supervise him. And he knows that I know about bicycles, so he says: 'Come on, lad, let's meet up in San Diego and go shopping and you tell me [what to get].' […] And we go from shop to shop, shop to shop. [...] And he knows and says to me: 'Yes, ok, ok, you get this, you know this stuff.' And afterwards, I have to go to his house and install it all. And slowly I teach him so that later he won't need me so much and will be able to fix his bicycle. [...] because it would indeed be super complicated if I had to go every day to fix his bike for him. (Interview 30, 18/07/2011)

Although this anecdote was told in a humorous and good-hearted way and there was no complaint, it shows the time demands that people encounter when they know bicycle mechanics.

Students were a special group in this respect. Cycling groups had formed at various universities and students had organised to establish bicycle workshops on several campuses. *Pedalea!Beauchef*, the first workshop at the University of Chile, had supported two workshops in other faculties as well as a new group at the Catholic University which was founded at the time of the fieldwork. Generally, these workshops aimed to provide knowledge and tools so that students would learn to do the repairs themselves.

Additionally, *Recicleta* organised repair days around the city. People could come and get their bicycles repaired for free. The interest was overwhelming, which shows that not everyone manages to build this kind of personal support network described above. Anecdotal evidence from these events shows that a simple puncture can stop people from cycling. It also shows that people manage great distances on barely functional bicycles because they do not know that some simple maintenance could make it easier or because they do not have the skills to carry out the maintenance work.

A general lack of knowledge of bicycle mechanics combined with a general mistrust towards professional bicycle workshops, resulting from insufficiently qualified bicycle mechanics in the workshops and the cost of repairs, had led to a situation where people needed to find alternative support in order to maintain their participation in the practice. The cycling organisations here provided this alternative support in bicycle mechanics so that the material element of the practice could be maintained or repaired and the performance could be continued.

7.2.3   Learning to ride a bicycle

Learning to ride a bicycle as an adult contradicts two strong popular beliefs in Santiago: first, that every child learns to ride a bicycle and second that you never forget how to ride a bicycle. Both are untrue. During my fieldwork, I met some people who had never learnt to ride a bicycle, and many people who had abandoned the practice at some point in their lives (see chapter 5) and then lost the skill through lack of practice.

Because it is assumed that every adult knows how to ride a bicycle, people who don't know may feel embarrassed to admit this. A student at the Women's Cycling School explained the reluctance to admit she could not ride a bicycle:

> There are people whom you tell that you don't know how to ride a bike and it's like 'But how don't you know how to ride a bike?' You are practically a loser. Like 'Where was your childhood?' you know? (Interview 26, 14/07/2011)

Although cycling is not a widely established practice, not knowing how to ride a bicycle appears to be unimaginable to some people who have cycled all their lives, as if a crucial element of childhood had been missed. This general attitude can present an obstacle for those people who might think about learning to ride a bicycle at an adult age.

Also, there are practically no options to learn the skill as an adult other than asking a family member or friend for help. This does not always end well as the personal story of a student at the Women's Cycling School shows:

> I asked my partner who knows how to ride a bicycle that he should teach me. So we went two or three times to the public square [...] and his strategy (and I had looked on google) was to use the slope, places with a slope, so that in that way I would manage to find my balance. Well, in the end everything resulted in a fight, I felt super frustrated because he expected me to start riding promptly, and he felt frustrated, too, because he didn't know how to teach me. For him, it was something so obvious, he had learnt it at such an early age. So finally we ended up in a fight and all, I don't know, and I abandoned the bicycle. (Interview 26, 14/07/2011)

In this case, both the woman as well as her partner ended up frustrated. Teaching an adult is different from teaching a child. While the technique of using a slope is often used for children, adults usually have built up more fears of falling, and a much slower and more patient approach is required. Relying on family members or friends for learning how to ride a bicycle can be problematic, because they do not necessarily have the experience and the skill to teach and because it requires time and patience. The adults who already feel embarrassed about not being able to ride a bicycle may not feel comfortable to ask a family member for this time commitment. Both of these observations were confirmed by another woman at the Cycling School. This woman had bought her bicycle when she retired four years prior to attending the Cycling School:

> My bicycle was hanging there and I didn't dare and when suddenly I see the advertisement [of the Women's Cycling School]: 'Ah, this is for me! That's it!' And my son asked me: 'Mummy, why did you pay to do that of all things?' But I told him: 'No, you need didactics.' You need someone to teach you. Because, well, he

has patience, but one cannot take advantage of the patience of others. And it was very good, very good, the Cycling School. (Interview 22, 10/07/2011)

The Women's Cycling School provides an opportunity for adult women to learn to ride a bicycle with a special approach which is sensitive to the fears that adults have built up and accommodates the different speeds at which the individual participants progress. As the instructors are not family members or friends, but professionals with experience, there seems to be less embarrassment and less pressure to progress, and by the end of the course which I observed all women but one achieved a sufficient level of competence to be able to practice further on their own. Some continued to meet at the Sunday street closures to practice together and one woman continued with the next level at the next course. Others did not manage to integrate regular practice in their weekly routines. It remained open how many of the students of the beginner level would achieve the level of competence required for everyday urban transport cycling.

7.2.4   Cycling in urban traffic

The fear of traffic accidents is the reason which is most often cited for not cycling. While transport is often conceptualised in terms of the most efficient way from a point of origin to the point of destination, urban transport cycling can only be understood by acknowledging the experience between these points (see Spinney, 2007). The experience of an accident as well as the mere perception of risk can stop people from participating in the practice.

Cycling in urban traffic combines two tasks: selecting a route and negotiating traffic. Selecting a route is mainly a question of experience. There are websites which are supposed to help find a route, but most of them are rather limited in criteria for selection, which can vary considerably. The criteria most frequently mentioned in interviews were the directness of the route, cycleways or wide sidewalks for cyclists who wanted to avoid cycling in traffic, and secure neighbourhoods out of fear of assaults and bicycle theft. For those cyclists who cycled on the carriageway, knowledge of the direction of the roads was required as Santiago has mostly one-way streets and a few streets change direction according to the time of day.

Negotiating traffic is the greatest barrier to cyclists in Santiago. Among the experienced cyclists, some combined good cycleways with cycling on the carriageway and avoid badly designed or maintained cycleways. Some avoided cycleways altogether and cycled

exclusively in traffic, and the most extreme cyclists enjoyed filtering in and out of car lanes, overtaking cars and buses at peak times and demonstrating that cycling is faster. However, one of those experienced cyclists who cycled exclusively on the road acknowledged:

> And there is also the factor that really the conditions aren't appropriate to cycle on the road. You are at your own risk and your own ... it's like the confidence you have in yourself, nothing more, in order to cycle. (Interview 29, 18/07/2011)

According to this cyclist, cycling in urban traffic mainly needs confidence. On the road, you are unsupported and cycle at your own risk and that takes confidence. This is daunting to inexperienced cyclists, some of whom do not cycle to places if there are no cycleways and some of whom combine cycleways, local roads with few cars, and parts on the sidewalks of bigger avenues. As the increasing amount of cyclists on the sidewalk has caused conflicts (see chapter 5) and due to the safety in numbers phenomenon, most cycling organisations promote cycling on the carriageway.

The Women's Cycling School has a second level at which women can learn to cycle on the carriageway in a safe and confident manner. The course starts with various exercises to improve the control over the bicycle: cycling with one hand, crouching down, braking abruptly, doing sharp turns etc. Then the students are taken to the road and cycle in caravans. An instructor at the back always takes a bit more of the lane so that cars cannot come too close to the students. Nevertheless they experience the feeling of being on the carriageway albeit in a supportive environment.

Similarly, other cycling organisations reported that they had accompanied new cyclists. *Pedalea!Beauchef* collected good routes to the campus on an online map and a paper map on the wall of the workshop and had a scheme called *Padrinos Mágicos* (Magic Godfathers) offering students who wanted to start cycling to university to accompany them on the journey for a few days until they knew the route and felt safe enough to cycle on their own.

7.2.5   Summary

As was shown in this part, the activities of cycling organisations effectively solve particular problems of individual (potential) cyclists. The three organisations helped with acquiring a bicycle, bicycle repairs, learning to ride and cycling in urban traffic. However, this part also shows that while the cycling organisations effectively solved one problem, people did not necessarily become full-fledged transport cyclists, but sometimes encountered other (maybe previously unforeseen) obstacles which kept them from cycling. In general,

however, people who had been helped by cycling organisations had found the help a useful step towards cycling.

7.3 Creating a community of practice

Most of the existing research as well as policy efforts have focused on eliminating barriers to cycling, which is similar to the approach taken in part 2 of this chapter. However, through observations and informal conversations, I realised that the civil society activities had an effect beyond the targeted support aimed at eliminating a specific barrier for an individual: additionally, encouragement was given, fears were dispelled, information was exchanged, friendships were formed etc. In this part of the chapter, I will argue that the civil society activities are not only targeted support for individual cyclists, but significantly contribute to creating a community of practice.

I will use Wenger's (1998) concept of community of practice characterised by mutual engagement, joint enterprise and shared repertoire to analyse the civil society activities for a second time. I will argue that the networks created by the organisations and the mobilisation provide space for mutual engagement (section 7.3.1). In these spaces emotional support is provided by forming a collective response to the risks associated with cycling as well as improving the self-confidence of the members of the community (section 7.3.2). Furthermore, the educational activities can be interpreted as negotiation of the joint enterprise of the community and the construction of a shared repertoire among urban transport cyclists (section 7.3.3). Finally, cycling organisations also reach out beyond the community of practice to recruit new members (section 7.3.4) which strengthens the practice vis-à-vis driving.

7.3.1 Spaces for mutual engagement

Wenger (1998) argues that a community of practice is characterised by mutual engagement. Wenger states that '[p]ractice does not exist in the abstract. It exists because people are engaged in actions whose meanings they negotiate with one another' (ibid.: 73). A community of practice does, therefore, not merely consist of people in the same organisation or the same place, although 'geographical proximity can help' (ibid.: 74), but is defined by the mutual engagement in the practice.

For transport cycling, this is a slightly problematic requirement as the doing of cycling does not necessarily involve any other cyclists and is primarily an engagement with motorised transport, i.e. non-members of the community of transport cycling. Mutual engagement and the negotiation of the meaning of the practice with other cyclists, therefore, mostly take place between performances.

The activities of the civil society groups create spaces where cyclists can have conversations about recent experiences, problems, worries, news etc. The following quote by a member of a public bicycle workshop initiative shows that this project aims to create a space for these conversations:

> And irrespective of whether they learn or not how to fix a bicycle, I really like it when people start to let go and to think about things … there is an interesting social factor there that comes up when I start sharing my fears, sharing my anger, and sharing my joys as well. Clearly, it's a slow process, it's not massive, but I feel that in this contact from one person to another person the message is much more incisive than if I do it with a speech or via mass media. It's slower, yes. But the people leave with a good mood, in good spirits, and that alone is enough.
> (Interview 9, 14/04/2011)

This quote shows that this civil society initiative is not only aimed at providing support in the form of bicycle repair, but essentially aims at creating spaces where people can share experiences, fears, anger and joys, and it underlines the importance of personal contact. According to the interviewee, even if in that way fewer people can be reached than with mass communication, a personal conversation is more effective in getting the message across and also has emotional benefits in that these spaces for conversation leave people 'in good spirits'. I will return to this idea in section 7.3.2.

Apart from the one-on-one contact, which various groups stressed as important, I could observe the popularity of events which provided the space to cycle collectively, such as the *CicloRecreoVía* street closures for cycling on Sundays as well as the regular mass cycle ride every first Tuesday of the month organised by the MFC. I first interpreted the mass cycle rides as confrontational political act, as cyclists taking the roads, in line with the critical mass movements in other countries. While this is how the Tuesday rides started, the rides in 2011 had a different character. They were officially registered and accompanied by the police on motorcycles, and rather than being a demonstration *by* the cyclists, each ride felt like a demonstration *to* the cyclists of what it could feel like to have the space to cycle freely on the carriageway protected by a mass of other cyclists. Two members of the MFC confirmed that it was not about protesting in front of the presidential palace, but rather

about "validating a form of transport in the city" (Interview 15, 26/05/2011) and "demonstrating how to cycle in traffic", including for example not using the sidewalks (Interview 4, 07/04/2011). Rather than attributing the popularity of these events to the thrill of a confrontational demonstration, the popularity of these relatively unobtrusive events might rather express the demand for opportunities to do urban cycling collectively. The street closures as well as the Tuesday mass cycle rides may, therefore, be interpreted as a space for mutual engagement.

Finally, most cycling groups had an online presence. Most had established extensive networks, mainly via Facebook and Twitter, but also through email distribution lists. A member of the MFC stated that they had a core network of about "300 to 400 bicycle users that are well coordinated amongst one another" (Interview 4, 07/04/2011). Additionally, some organisations had weblogs with a comment section, and *Pedalea!Beauchef* had an online forum for its members. These virtual spaces are additional opportunities to engage with other cyclists, share experiences and debate opinions and were fervently used.

7.3.2   Emotional support through the community

Within the spaces created by the cycling organisations for mutual engagement, emotional support seemed a significant component. Horton (2007) details the different kinds of socially constructed fears: the fear of accidents and physical harm, the fear of assaults and crime, the fear of judgement from others, and the fear of sensing one's own body. All of these fears existed in Santiago and even experienced cyclists who did not feel these fears themselves were confronted with them through worried family members.

Beginner cyclists felt a certain stigma. As much as it had been stigmatised to need the bicycle as mode of transport because of the lack of a car, several women in the Cycling School also felt the stigma of not being able to cycle. Entering this community was an emotional process which started with the realisation that there were others in the same situation, as expressed here by one of the students of the Women's Cycling School:

> First, it was a change to see that there were other older people who were going through the same. So, there I am not the only one! There are others that have this problem. (Interview 22, 10/07/2011)

Note in this quote, not being able to cycle is viewed as a 'problem' and the dealing with this problem means 'going through something'. Having other people in the same situation

seemed to make it better. There also seemed to be an appeal in doing cycling together, as expressed in the following quote by a student of the Women's Cycling School:

> ... and on my own, maybe there was a time when I could have gone on my own, but it's like I need the support at my side, I mean, I would like to go when they go as a group on Sundays, that I'd like. Or, obviously, with my daughters. It's about feeling the support of being with another person at one's side. (Interview 21, 07/07/2011)

The physical presence of other people seems to provide significant emotional support and motivation.

Many students of the Women's Cycling School mentioned that it had helped that there had been such a good atmosphere and to feel understood. For example, one student stated:

> And when I see a group that is so nice, so full, they arrived and the welcome, and all, and they understood that you had a trauma. Because really it is a personal trauma not to be able to ride a bicycle. It's psychological, barriers that one puts up. And they on their own eliminate those barriers, they take them down, and it starts slowly. I remember that they started first with sitting on the bicycle, one foot, then the other foot, ahh, I can do it, I can pass the cone, I can get to the corner, and they take away the fears like some layers that one has. And those layers when they go, slowly, slowly it sets you free. And then you let go and then there is no one who can hold you back. (Interview 22, 10/07/2011)

An additional dimension was that these people were volunteers and spent their time for the person. The altruism was particularly powerful in creating bonds, as expressed in the following quote by another student of the Women's Cycling School:

> That is why I asked you about the Recicleta guys the other day, whether they had any profit, because what they do is for the love of what they do, it's purely for the love of it[16], and it's incredible that there still are, … one always complains about people, but there still are people out there who do good. (Interview 23, 11/07/2011)

Finally, the achievement of learning how to ride a bicycle gives confidence for other life challenges as these two very honest quotes by two students of the Women's Cycling School show:

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[16] The interviewee uses the Spanish expression 'por amor al arte' which can be translated as 'for free' or 'without payment', but my impression in the interview and during the eight weeks of the cycling classes, in which I was able to observe the interaction between the students and the Recicleta mechanics, was that here the expression is meant in a more emotional and literal way actually as love for the work and the cause.

You know, after I learnt to ride I think I can do everything in life. It gave me self-confidence. [...] It gave me great happiness and satisfaction, and as I told you, the confidence to do many things in life and to keep fighting. (Interview 21, 07/07/2011)

I think that it's one of the greatest triumphs that I have had in my life, like graduating from uni, doing a master's degree, [...] riding a bicycle is like: I am brilliant, you know? I swear to you, I think like this thing has really positively affected my self-esteem, a lot. So, if someone tells me that I can't do a certain thing, it's like 'I can do anything because I learnt to ride a bicycle at the age of 30. So I feel great. (Interview 26, 14/07/2011)

Both of these quotes express the power of the achievement for developing confidence and self-esteem.

It is not only inexperienced cyclists, however, who benefit from the emotional support of the community. Experienced cyclists used the time with cycling organisations to share experiences, news and also emotions. Although they generally experienced less fear and worries in the everyday of cycling, in the event of accidents, I observed several times that the meetings of cycling organisations provided the space to tell the stories and to process what had happened. Some admitted that it had shaken them up, others minimised the incident, but accidents were definitely something to discuss.

Finally, I could observe that the personal relationships between the members of the cycling organisations and the joint work for the cause were mutually reinforcing. In all the cycling organisations with which I spent time, I could observe that the engagement with one another during meetings and events brought people closer together. Wenger describes that the mutual engagement creates deep relationships and thereby the community of practice 'can become a very tight node of interpersonal relationships' (1998: 76). Most of the cycling activists whom I met had formed friendships with other members of their organisations. Participating in the work of the organisation was as much about spending time with friends as it was about providing support to (potential) cyclists. These bonds of friendship thereby strengthened the community of practice.

7.3.3   Joint enterprise and shared repertoire through education

The second dimension of a community of practice is the joint enterprise (Wenger, 1998: 77-82). Joint enterprise is a collective negotiated response to the conditions in which the practice is performed and it creates relations of mutual accountability among the members of the community. The idea of joint enterprise does not mean simple agreement. On the

contrary, disagreement can become a productive part of the enterprise: the enterprise is joint 'in that it is communally negotiated' (ibid.: 78).

As discussed in chapter 5, the community of urban transport cycling in Santiago is fragmented, and mutual engagement and the negotiation of a joint enterprise occur principally in separate groups within the community of practice. However, the education initiatives and the mobilisation of the community for certain joint goals can be seen as processes of negotiating a joint enterprise.

The first educational activities for cyclists were carried out by *Arriba 'e la Chancha* at the beginning of the 2000s. According to a member of the organisation, the activities were targeted at the traditional cyclists, those that had not stopped cycling during the rise of the car, and covered cyclists' rights in the case of an accident, foremost including how to collect the payment of the insurance. The great majority of these cyclists were from lower income backgrounds and vulnerable to be deprived of fair compensation (Interview 9, 14/04/2011). These efforts can also be interpreted as an attempt to reach out to the traditional cyclists and integrate them in the community of practice by negotiating this joint enterprise with one another. This negotiation is ongoing; at the time of the fieldwork the focus had changed from the traditional cyclists to new cyclists. A cycling activist pointed to the need for new cyclists to be instructed:

> … but that they don't find themselves tomorrow in conflict when they experience a collision and for lack of knowledge of the laws that regulate the traffic they don't know how to act in the face of an accident, which is what is happening today [...] they are cheated out of their rights by motorists who say 'Don't worry. I will pay for the bicycle.' And the people opt immediately 'Sure, fix my bicycle.' 'You don't have any physical problem?' 'No, no, no.' and they come to an oral agreement and they forget that apart from the insurance that is then covered, there is also a civil claim for cyclists that can also be pursued. (Interview 4, 07/04/2011)

At first sight, this quote shows an ongoing concern for cyclists' rights in the case of an accident. However, it also shows that the negotiation about the appropriate response to an accident has not ended. The interviewee assumes that people lack knowledge and/or that they forget that they can pursue a civil claim, which here is viewed as appropriate response. While lack of knowledge is common among cyclists, I could also observe that experienced cyclists had no interest in going to court. One student cyclist at *Pedalea!Beauchef* once mentioned after a crash that he also drives and that he knew that the motorist had not seen him. For him, it was more important to show good-will.

In the practical sessions of the Women's Cycling School certain cycling skills were developed. This creates a shared repertoire of responses in traffic. In the theoretical sessions this was additionally strengthened by explanations of traffic situations and appropriate responses. However, the cycling school was not only about shared repertoire. In the theoretical sessions a certain philosophy of cycling as benign mode of transport was always the basis. The sessions were about positive aspects of cycling safely and confidently in the city. It is notable that civil claims against motorists were not mentioned here.

Furthermore, I could observe that there was a variety of cycling manuals and also flyers with advice on cycling. Flyers might have shown the top ten tips for cycling or similar summaries. The manuals were more detailed, describing the parts and functioning of a bicycle, basic maintenance and repairs, but most importantly showing schematic representations of traffic situations. For me, these appeared like an effort to standardise and thereby stabilise the practice in these rules reified in a manual. The presence of multiple manuals however shows that the negotiation of the joint enterprise is ongoing.

Finally, the network created through social media also provides information. For example, a member of *Arriba 'e la Chancha* has developed a blog on urban cycling which gives support and tips for cyclists on buying cycling accessories, planning routes, cycling safely and repairing and maintaining a bicycle. These online spaces thereby play a significant role in the negotiation of joint enterprise and the creation of a shared repertoire. The success of the educational efforts is expressed in the extremely quick mobilisation. For example, when the cycling organisations found out about the proposed amendment to the Traffic Law (see chapter 5) they were able to inform and mobilise cyclists for the first mass cycle ride by the next day.

7.3.4 Growing the community

Apart from supporting existing members of the community of urban transport cyclists, inspiring more people to cycle was an explicit aim of most organisations. As has been shown above, *Macleta* reached out beyond the community of practice by teaching women how to ride a bicycle, *Recicleta* provided bicycles, *Pedalea!Beauchef* gave support for students who wanted to assemble a bicycle or start cycling to university.

Although these activities were generally seen as positive, they were sometimes discounted as too small-scale and therefore insignificant. This critique was expressed by members of the organisations themselves as well as other people in the field. Proponents of the small-

scale approach acknowledged the trade-off between intensity of a contact and the number of people who could be reached. In the following quote, a member of Recicleta refers to the bicycle mechanics lessons which Recicleta holds at the Women's Cycling School:

> It needs cultural changes here. And I think that a cultural change needs to start with education, it has to start in the schools, it has to start with the provision of information and teaching. And in some way, that is what we do jointly with Macleta in the Women's Cycling School. Maybe they are very few, but you start small and build up. If today there are five, with a multiplier effect of 2 to 1, tomorrow there will be 10, and that is how you can project infinitely. (Interview 7, 13/04/2011)

According to the interviewee, cultural change is achieved through the provision of information and education. For the interviewee, it was satisfactory to teach a small group because he trusted that the information would be further disseminated. The idea of the multiplier effect (albeit in a less mathematical form) was confirmed in several conversations and interviews with people who had in some form benefited from the activities of the cycling organisations and wanted to pass on their newly gained skills and knowledge, like this student of the Women's Cycling School:

> And you know what, since I learnt to ride a bike, I would love it if my sister could learn it as well. I would love that. […] I think that one develops the wish to be able to teach [this] to the people whom you love, or to any other person as well, so that they learn, because it makes many things easier for you. (Interview 23, 11/07/2011)

Indeed, several of the students at the *Pedalea!Beauchef* workshop told me that they had started to volunteer as mechanics at the workshop after they had received help with assembling their own bicycles.

> Yes, in fact, that's where my vocation started to be a mechanic in the [Pedalea!Beauchef] workshop: from assembling mine, and then seeing that, ohh, it turned out great and all, and then seeing other people who came to the workshop and didn't know, and I said 'but I know how to do this and I will help, too'. So, it's nice. (Interview 30, 18/07/2011)

This interviewee decided to stay on as a volunteer after he had gained knowledge and developed skills through assembling his own bicycle.

There are also efforts of cycling organisations aimed at a broader audience. The weblogs associated with *Arriba 'e la Chancha* (its own blog as well as *Ciclismo Urbano* and previously *Bicivilízate*) provide general information for cyclists and those who would like to start cycling. Bicivilízate was especially aimed at the discussion of bicycle fashion and gadgets in

order to appeal to the consumer and 'sell' cycling as fun. The *Bicicultura* Festival, in the organisation of which participates a variety of civil society groups, institutions, companies, and the media, coordinated by the *Centro de Bicicultura* is a celebration of the bicycle around the World Carfree Day, which includes various activities, including a bicycle art exhibition, seminars on cycling, a star-shaped cycle ride, cycling fairs, etc. These events attract media and politicians and contribute to shaping a positive image of the practice in the general population. Ultimately, the aim here is to grow the community, but also to reduce conflicts with competing practices, especially driving, by creating more general understanding of the practice.

Every cyclist is a potential 'multiplier' of the practice. According to my observations, cyclists who knew bicycle mechanics often helped other cyclists (see section 7.2.2). Furthermore, in the quotes above we can see that the motivation to help others was created by receiving support. Finally, the weblogs and the organisation of mass events built links to potential new members for the community of practice. Through the engagement of members of the community with new people growing urban transport cycling can gain momentum.

7.4 Conclusion

This chapter has shown that the growing practice approach, which consists of targeted support for individual (potential) cyclists, can be a significant contribution to facilitating urban transport cycling. In the first part of this chapter, I analysed support provided by cycling organisations to individual (potential) cyclists. I identified four moments when the practice fails to recruit or loses carriers: acquiring a bicycle, doing bicycle maintenance and repairs, learning to ride a bicycle and cycling in urban traffic. Carriers are not necessarily affected by any of them and they differ in the way they approach and potentially overcome them. Nevertheless, these points are the most common moments when the practice is abandoned.

For each of these points of failure, I analysed support activities or services. I have argued that these activities are mostly effective in solving a particular problem for an individual cyclist. As the activities are developed within the community of practice, they are based on an in-depth and contextually specific understanding of the practice and the difficulties urban transport cyclists may encounter. The support can therefore be tailored specifically to the problem of a particular cyclist. However, because cycling consists of various tasks, providing targeted support for one obstacle does not guarantee participation in the

practice. Providing a bicycle or teaching how to ride it does not automatically generate a new carrier. A more multi-faceted approach could be found in *Pedalea!Beauchef* where support was provided for the acquisition of a bicycle, maintenance and repairs as well as route selection and cycling to the campus. This strategy coincides with the general agreement in the cycling literature that the aim to increase urban transport cycling calls for a multi-faceted policy approach which combines several measures (Pucher and Buehler, 2008; Bauman et al., 2008; Jones, 2012).

In the second part of the chapter, I focused on the 'side-effect' of the civil society activities: the contribution to the creation of a community of practice. I used Wenger's (1998) concept of the community of practice, which is characterised by mutual engagement, a joint enterprise and a shared repertoire. I have argued that while providing targeted support, the cycling organisations also provide spaces for mutual engagement in which members receive emotional support. Through educational activities, they negotiate the joint enterprise of the community and aim to create a shared repertoire. Finally, they also reach out beyond the community of practice not only to recruit new members, but also to develop a positive image and general understanding of the practice in the urban population and contribute to stabilising the practice as part of the urban transport system.

It is notable that the internet and social media proved to be a significant tool for communication, education, mobilisation and for shaping the image of cycling. Information could be provided fast, advice was constantly available through weblog posts on all sorts of bicycle topics, and the stigmatisation of the bicycle, which had been significantly reproduced through traditional media, could be confronted with positive messages about cycling. Therefore, in Wenger's terms, the mutual engagement and the negotiation of a joint enterprise as well as the urban cyclists' identity had at least partly been relocated to the virtual world.

Finally, this chapter suggests that small-scale support activities might be more significant than is often assumed. Although the effectiveness of the activities of the cycling organisations mentioned above was generally acknowledged, they were seldomly viewed as *significant* contribution to increasing urban transport cycling. The main reason for this lack of credit was the issue of scale. With the exception of mass cycle rides, civil society activities are generally small-scale and therefore seen as 'drop in the ocean'. However, this chapter suggests that the small scale of the activities has significant advantages vis-à-vis catch-all policy measures, such as the building practice approach. The nuanced

understanding within the cycling organisations of the practice as well as its potential points of failure and the small scale of the activities allowed the cycling organisations to address the difficulties of individual carriers in a personalised way, which proved effective. Furthermore, several interviews with the beneficiaries of these activities suggested that the enthusiasm within the cycling organisations and the emotional support which the interviewees had received had been important aspects of their experience with the community of practice, which again points to the significance of personal support and therefore small-scale activities. Furthermore, in contrast to the building practice approach, the personal nature of the support made it possible to avoid to some extent the contestedness and the conflicts that characterised infrastructure interventions. Finally, some interviews pointed to the possibility of a diffusion of the practice through a multiplier effect. Several beneficiaries of the support activities mentioned the desire to recruit more carriers, which would further contribute to growing the practice and its community, possibly long after the support from the cycling organisations had ended. In view of the size of the city and the challenge of systemic change, small-scale activities may seem insignificant, but this chapter suggests that the small-scale personalised nature of these activities can be effective in growing the practice in a decentralised organic way.

Chapter 8: Discussion

This chapter will discuss the results of the empirical analysis in the context of current debates in the field of practice theory. I will argue that practice theory could benefit from a shift in focus from particular elements of practice to specific relationships. I will suggest five relational dimensions of practice which deserve particular attention: first, the relationship between the practice and the individual situated experience of its performance; second, the relationship between the practice and the socio-technical system in which the practice is embedded; third, the relationship between the practice and co-existing practices; fourth, the relationship between the practice and its material arrangement; and, finally, the relationship between the practice and its community of practice.

In the first part of this chapter, I will return to the practice literature presented in chapter 2 and discuss how the practice of urban transport cycling in Santiago differs from the ideal type conceptualisations of practice, communities of practice and the process of recruitment in practice theories. Based on the empirical analysis of urban transport cycling in Santiago, I will then propose a more relational perspective for the analysis of practices and their trajectories, which emphasises the relationships of the practice to the individual situated experience of the performance for the negotiation of the meaning of the practice; the socio-technical system in which the practice is embedded; and the relations between co-existing, especially competing, practices, which brings to the forefront the political and contested nature of practices. I will argue that a relational perspective which connects these three dimensions of practices may contribute to a better understanding of practices, their trajectories and also interventions in the trajectories of practices, to which I will then turn.

In the second part of the chapter, I will focus on approaches to facilitating practice. I will review the two approaches to facilitating urban transport cycling in Santiago, which I identified in the field, 'building practice' and 'growing practice', and explore what the analysis of these approaches can contribute to current debates in practice research.

I will argue that the building practice approach shows how the notion of contested practice and selected concepts from Science and Technology Studies can complement practice research in the analysis of the genesis and the effect of infrastructure interventions and the relationship between the practice and its material arrangement. Based on my analysis of the planning and design of cycleways in chapter 6, I will argue that providing specialised

cycling infrastructure in Santiago was a particularly political and contested process, because it occurred within and was shaped by an urban transport system which predominantly prioritised motorised transport and thereby marginalised urban transport cycling. I will argue that selected concepts of Science and Technology Studies, namely scripts, programmes and anti-programmes, the Social Construction of Technology approach and the concept of socio-technical systems, can contribute to conceptualising the relationship between the practice and material infrastructure interventions in the context of the socio-technical system of practice.

The second section will focus on the 'growing practice' approach and the relationship between the practice and its community of practitioners. Growing practice includes providing targeted support for individual (potential) cyclists and thereby creating, consolidating and growing the community of practice. Practice theory has so far been sceptical as to the cultivation of a community of practice. I will argue that it would be useful to combine the focus on top-down policy approaches with a focus on bottom-up approaches from within the community. Instead of asking how governments may cultivate a community of practice, one could ask how governments may contribute to creating the conditions for communities of practice to grow from within and thereby facilitate the practice.

8.1 Conceptualising practice

In this part of the chapter, I will first examine several concepts put forward within the practice literature, namely the idea of shared understanding, the concept of organising structures, the definition of community of practice and the concept of the process of recruitment, and summarise how the case study differs from these concepts. While it has been argued that ideal type conceptualisations have merit, even though empirical case studies may differ, through providing guidance for empirical research, I will argue that this guidance may conceal the value of focusing on certain relationships as opposed to particular elements of practice concepts.

In the second section, I will focus on three relationships which I argue are particularly productive for the analysis of practices as well as interventions in the trajectory of a practice: the relationship between the practice and the individual situated experience, the relationship between the practice and the socio-technical system in which it is embedded,

and the relationship between the practice and its competing practices which constitutes the contestedness of practices.

8.1.1 Urban transport cycling as a practice?

In this research, I have treated urban transport cycling as a practice because it is a recognisable entity within the city. In Santiago, I could observe individuals who collectively identified as urban transport cyclists and others who distanced themselves from that community of practice. However, the case study of urban transport cycling in Santiago diverges from several conceptualisations in practice theories, namely the notion of a shared understanding, which is an essential part of most practice concepts (Schatzki, 2001), the idea of rules as organising structures (Schatzki, 2002), Wenger's (1998) concept of community of practice and Barnes's (2001) description of the process of recruitment of carriers, all of which have been presented in detail in the literature review in chapter 2.

Most definitions of social practices include a notion of shared or general understanding (Schatzki, 2001; Reckwitz, 2002b). Schatzki's (2002) general understanding consists in a view of the practice and its community. Reckwitz specifies that a practice 'is not only understandable to the agent or the agents who carry it out, it is likewise understandable to potential observers (at least within the same culture)' (2002b: 250). Bourdieu, however, challenges this view of shared understanding and argues that 'it would be naive to suppose that all practitioners of the same sport (or any other practice) confer the same meaning on their practice or even, strictly speaking, that they are practising the same practice' (1984: 209-211). As we have seen in chapter 5, transport cycling in Santiago did not coincide entirely with the notion of shared understanding. In the general population, cycling was associated with various images. The stigmatisation of transport cycling had been challenged by more positive images, which portrayed cycling as an environmentally friendly mode of transport used mainly by young professionals commuting to the office. However, the increase in cycling had also exacerbated the conflicts over space, and cyclists were increasingly being portrayed as dangers for pedestrians on the sidewalk or as reckless risk-takers on the carriageway. Therefore, a general shared understanding of urban transport cycling in Santiago could not be observed.

Additionally, according to Schatzki (2002), practices are organised by rules and teleoaffective structures. Rules are 'explicit formulations, principles, precepts, and instructions that enjoin, direct, or remonstrate people to perform specific actions' (ibid.:

79) and which people take account of and adhere to when they perform the practice. Teleoaffective structures represent a normative organisation of the practice, consisting of ends, which the participant in the practice should or may pursue as well as projects and tasks which the participant should or may carry out and perform to its particular end (ibid.: 80).

As was shown in chapter 5, practitioners in Santiago did not all adhere to the same rules. On the contrary, there were harsh conflicts within the community of practice, for example with regard to the issue of cycling on the sidewalk. Rather than the existence of general rules, I could observe that cyclists justified particular performances according to individual evaluations of risks and other criteria. While I could observe rules and normative structures, they were contested, sometimes ignored and sometimes negotiated.

Furthermore, the community of urban transport cycling – if the cyclists in Santiago can be called a community – significantly differs from Wenger's (1998) concept of communities of practice which are defined by mutual engagement, which creates shared meaning, joint enterprise, which establishes accountability between cyclists, and a shared repertoire.

As was shown in chapter 5, the community of urban transport cycling in Santiago was fragmented with a dispersed set of traditional cyclists, several groups of organised cyclists and another dispersed set of new and inexperienced cyclists, which limited the potential for mutual engagement and the negotiation of a joint enterprise. Cycling as mobility practice is naturally carried out at different places and times, integrated into complicated schedules of day-to-day lives. Therefore, mutual engagement is limited. Reckwitz challenges the idea that a practice requires mutual engagement: 'A practice is social, as it is a 'type' of behaving and understanding that appears at different locales and at different points of time and is carried out by different body/minds. Yet, this does not necessarily presuppose 'interactions'.' (2002b: 250) In the case of urban transport cycling in Santiago, mutual engagement was mostly limited to groups of cyclists within the community in which cycling was discussed and meanings negotiated before and after the actual performance. Similarly, while I could observe efforts to negotiate a joint enterprise, these were limited to some of the groups of organised cyclists, and did not include the entire community of practice in Santiago.

Finally, the case of urban transport cycling in Santiago also differs from Barnes's (2001) description of how a person becomes a member of a community of practice. Barnes states

that a practice is performed by a carrier who 'has to be sensitive to what other practitioners are doing.' (2001: 26) This means the practitioner must be 'both cognizant and disposed to move in the direction of the practice in order to be a practitioner herself' (ibid.). Reckwitz agrees with this description and states that '[i]f somebody 'carries' (and 'carries out') a practice, he or she must take over both the bodily and the mental patterns that constitute the practice' (2002b: 252). Barnes concludes: 'It is only through the interaction of a membership characterized by mutual intelligibility and mutual susceptibility that something identifiable as shared practice can be sustained, and its correct enactment distinguished from what is defective or incompetent' (2001: 26).

In the case study, it could be observed how new members joined the community of practice without sensitivity or disposition to adapt their performance to the established community of cyclists. Many new cyclists did not know the rules of traffic, cycled on the sidewalk, and did not connect to the established community of cyclists. Whereas according to Barnes (2001) an individual can only become a member if taught by experienced practitioners, the case study of urban transport cycling in Santiago showed that the sheer number of new cyclists allowed them to constitute a parallel dispersed group of cyclists, which was not integrated into the community of practice and did not share the same understanding of the practice nor adhere to the same rules. Still, 'something identifiable as shared practice' could be sustained, which challenges Barnes's (2001) conceptualisation.

I would argue that, similar to Reckwitz's (2002b) outline of 'an ideal type of practice theory', the concepts discussed above represent ideal types of practices, communities of practice and the process of recruitment. These ideal type conceptualisations are useful in order to distance practice theories from other social and cultural theories (Reckwitz, 2002b) and as reference points for empirical research (Schatzki, 2011). However, the case study of urban transport cycling in Santiago has shown that these concepts cannot be understood as list of criteria which must be met for a 'doing' to qualify as a practice. Schatzki confirms this and argues that ideal types are valuable for guiding investigations:

> ideal types are best viewed as possible ingredients of social phenomena: abstractions of factors, scenarios, processes, and the like that might or might not be present in particular cases. The value of a typology of ideal types lies in suggesting to an investigator what to look for in particular cases. It is not so much contrast and comparison between ideal types and real processes that tell an investigator pursuing explanation what she seeks to know, namely, why things happened as they did. Rather, a typology informs her that such and such factors,

processes, or sequences might be present, and this knowledge can inform her investigations. (2011: 24)

According to Schatzki, not all elements of ideal type conceptualisations need to be present in individual cases. Rather, ideal types can inform practice research by guiding the researcher's view to particular elements of practice which might (or might not) be present. Schatzki further argues that explanations can only be attained through the study of the empirical detail and thick description (ibid.).

However, being guided by certain ideal type concepts produces the risk of missing something else. I argue here that concepts of practice do not only guide the investigator as to what to look out for, but also as to *how* to look. The concepts of practice reviewed in chapter 2 guide the focus to elements of practice (Shove, Pantzar and Watson, 2012; Reckwitz, 2002b); organising structures (Schatzki, 2002), practitioner careers (Shove, Pantzar and Watson, 2012; Barnes, 2001) normativity and accountability in practices through teleoaffective structures (Schatzki, 2002) or the negotiation of a joint enterprise amongst the members of a community of practice (Wenger, 1998). The case study of transport cycling in Santiago shows that practices can differ considerably from these conceptualisations. However, more importantly, the case study suggests that a more relational perspective in practice research may be productive, to which I will turn now.

8.1.2 A relational perspective for practice research

The analysis of interventions in the trajectory of urban transport cycling in Santiago has brought to the forefront the significance of the individual experience of the performance for the meaning of the practice as well as of the socio-technical system in which the practice is embedded.

Practice theories distance themselves from the focus on individual behaviour and choice, which is common in behavioural economics and psychology. While the practice approach has contributed significantly to the understanding of what people do, the strong need to distance practice theories from a dominant behavioural paradigm (Shove, 2010) may have led practice theories to neglect individual situated experience.

While cycling is a practice and, therefore, a social phenomenon (see section 2.1.2), every performance of cycling is also a significant individual experience. The empirical accounts of individual cycling careers and particular cycling experiences in Santiago were infused with emotions and sensory experiences. This coincides with Spinney's (2007) work in which the

sensory experience of cycling is described in a vivid way. Schatzki refers to individual affectivity as an element which shapes practical intelligibility (2002: 75). Therefore, the cycling experience and the linked emotions shape whether it makes sense for a person to continue cycling or to abandon the practice. Furthermore, the individual experiences and histories are often shared with other cyclists, and because experiences are similar they become part of a collective memory, a joint resource which can be drawn upon in conversations and imaginations. Individual situated experiences thereby become part of the practice.

The acknowledgement of the individual situated experience does not contradict the fundamental rejection of the individualist perspective of behavioural models. Behavioural models based on individual choice, external drivers and causal relationships cannot be merged with practice theories and their emphasis on endogenous and emergent dynamics (Shove, 2010). However, the need to distance practice theories from the micro-approach in behavioural models may have led the advocates of practice theories to neglect the role of carriers in producing innovation and change. Taking into account the individual situated experiences and affectivities and the relation between the individual performance and the practice can complement the contextual 'meso-level' approach of practice theories.

On the other hand, practice theories are criticised for neglecting the macro context in which they are embedded. Geels criticises practice theories for its meso-level focus on local practices which makes the methods of practice-based research unsuitable for the analysis of systemic transitions (2010: 502-503). Additionally, Sayer criticises that practices neglect wider political economic matters and argues that '[u]nless a practice approach can be combined with political economic analysis, it is likely to be seen as safely depoliticizing' (Sayer, 2013: 176). These two critiques thereby question the usefulness of practice theories in view of the required systemic transitions at which interventions today are targeted as well as the ethical quality of theories which neglect the political nature of practices.

While practice research mainly focuses on the meso-level, practices have been conceptualised as embedded. Shove and Southerton (2000) show that the practice of freezing food was embedded in a complex arrangement of linked practices and technologies. Schatzki's (2011) material arrangements include institutions and organisms and can, therefore, indeed be used to analyse macro contexts. Additionally, recent publications have explicitly explored the relation between a systems perspective and the practice approach (McMeekin and Southerton, 2012; Watson, 2012). Watson (2012)

suggests recasting the socio-technical system as system of practice which consists of and is reproduced through practices.

This research used this conceptual platform to analyse the practice of urban transport cycling as part of and in relation to the urban transport system. I argued that the existing material infrastructure of the urban transport system, the traffic regulations and the fragmented institutionality of infrastructure planning in Santiago prioritised motorised transport, and thereby marginalised urban transport cycling. The meso-level focus of the practice approach and the systems perspective constituted a productive combination through which to identify the framing effects of the legal, institutional and material contexts.

The distinction between the micro-level of the individual situated experience, the meso-level of the practice and the macro-level of legal, institutional and material contexts seems to diverge from Latour's (2005) and Schatzki's (2011) notions of flat ontology. However, this is not an argument for reintroducing an explanatory 'social context'. The term macro context is used here as 'convenient shorthand' (Latour, 2005: 11-12), but the analysis of chapter 6 shows that this macro context can be broken down into specific associations of people, institutions, norms, and other practices, which all contribute significantly to shaping the practice of urban transport cycling. In this sense, the macro context can be taken into account in the analysis of a practice without diverging from the notion of flat ontology.

A relational perspective in practice research does not only refer to the individual situated experience and the macro context in relation to practices, but also to the relations among practices. Watson (2012) suggests that socio-technical systems should be understood as systems of practice which 'persist through the routinised actions of actors throughout the system, as they perform the practices which reproduce the institutions and relations comprising the system' (2012: 493). Above, I argued that urban transport cycling in Santiago can be better understood as part of and in relation to the urban transport system. Following Watson (2012), the urban transport system is a system of practice which consists of multiple mobility practices, such as walking, cycling, driving, but also countless other practices of infrastructure provision, land-use planning, manufacturing, advertising and many more (see Sheller and Urry, 2000). In this thesis, I have argued that the relations between urban transport cycling and driving significantly shaped the nature and trajectory of cycling in Santiago. The case study of urban transport cycling in Santiago has brought to

the forefront a political and contested dimension within practices which lies in the competition with other practices, here most significantly with driving. The relationship between cycling and driving is, therefore, very relevant for the understanding of the practice.

In chapter 5, I introduced cycling as a contested practice. 'Contested practice' is not supposed to be a separate type or category of practice, such as Warde's (2013) *compound practice*, but rather underline a characteristic of practices in general, which is particularly visible in transport cycling in Santiago at the time of the fieldwork. Most practices compete to some extent with other practices over carriers' time (see Shove, Pantzar and Watson, 2012), potentially over financial or space resources or social status, and therefore most practices include the potential for conflict and are to some extent contested practices. Furthermore, I understand contestedness as a fluid state of a practice. Contested practices can develop, conflicts can be settled and other conflicts might emerge. Currently urban transport cycling in Santiago is a particularly contested practice. However, experiences from other cities, especially in northern Europe, show that urban transport cycling is not necessarily as contested as in Santiago and that cycling in Santiago may become less contested with time.

In the case of urban transport cycling in Santiago, conflicts were particularly visible because cycling competed with driving, which is embedded in a system of automobility (Urry, 2004) and is thereby one of the most normalised and stable practices today. Furthermore, after its rapid success, driving is now critically challenged by climate change, urban traffic congestion and public health issues and cycling has been positioned as alternative (UN-Habitat, 2013). The case of urban transport cycling in Santiago therefore brings to the forefront the political and contested nature of practices, which practice research may so far have underemphasised through a general tendency to produce historical accounts of single practices and focus on mundane everyday practices in which the potential contestedness may not be as obvious as in the case study of this research.

The concept of contested practice has proven especially useful for the analysis of interventions in the trajectory of a practice. As was shown in chapter 6, facilitating a contested practice requires particular sensitivity for its inherent conflicts. A relational perspective which acknowledges the competition with driving will create awareness for the challenge of producing cycling infrastructure within an urban transport system which prioritises the car. For the researcher, analysing a particularly contested practice such as

urban transport cycling produces the challenge not to be drawn into the conflicts, remaining non-judgemental and acknowledging that there are various truths about the conflicts (see section 4.3.5 on the limits of triangulation). In conclusion, a relational perspective which includes the individual situated experience, the socio-technical system in which the practice is embedded and competing practices within that system and thereby a sensitivity to the contestedness in practices seems a fruitful basis for the analysis of interventions in the trajectory of practices, to which I will turn now.

8.2   Facilitating practice

As discussed in detail in chapter 2, practice research has generally been reluctant to suggest policy measures. Nevertheless, in response to the pressure of global challenges such as climate change, practice research has recently shifted its focus from historical accounts of the trajectory of individual practices to questions regarding interventions in the trajectories of practices and systemic transitions (Evans, McMeekin and Southerton, 2012; Shove, Pantzar and Watson, 2012; Watson, 2012; Spurling et al., 2013). This part of the chapter aims to contribute to these debates by reviewing the empirical work on the two approaches to facilitating urban transport cycling in Santiago: building practice and growing practice.

In the first section, I will discuss the approach to facilitating practice which I have termed 'building practice'. I will argue that the notion of contested practice can contribute to explaining design results in urban infrastructure. However, while the notion of contested practice and the inherent competition between cycling and driving brings to the forefront the contested nature of cycling, practice theories fall short when it comes to tracing this conflict through the process of infrastructure provision. I argue that the analytical tools from Science and Technology Studies, especially the Social Construction of Technology approach (Pinch and Bijker, 1984), can complement practice theory by providing a basis to trace the politics of technological development.

In the second section, I will discuss the approach to facilitating practice which I have termed 'growing practice'. Growing practice is a bottom-up approach in which new or inexperienced carriers are provided with targeted support for the everyday performance of the practice and which simultaneously contributes to creating a community of practice. I will argue that it would be useful to rethink the scepticism which practice research has so far shown vis-à-vis the idea of cultivating a community of practice. I will argue that it may

be useful to rethink the idea of growing a community of practice by taking seriously the potential of growth from within the community and by asking what kind of conditions this growth would require.

8.2.1 Building practice

The 'Building Practice' chapter showed the value of analysing infrastructure interventions through the lens of contested practice and in combination with concepts from Science and Technology Studies.

Building practice is an intervention in the trajectory of a practice characterised by the top-down provision of a particular element of the practice. In this research, building practice consisted of the provision of material infrastructure for urban transport cycling. This can be counted under Shove, Pantzar and Watson's (2012) first approach to policy interventions 'configuring elements' because it changes the material element of the practice. As discussed in chapter 2, practice theories assign a special role to the material as opposed to other social and cultural theories (Reckwitz, 2002b). Material infrastructure has been defined as part of the practice (Reckwitz, 2002b; Hand, Shove and Southerton, 2005; Shove and Pantzar, 2005; Shove, Pantzar and Watson, 2012 etc.) or as material arrangement linked to the practice (Schatzki, 2011). In both cases, practice theories acknowledge that material infrastructure can shape, facilitate or obstruct the performance of a practice.

Practice research has often drawn on the concept of script (Akrich, 1992) to describe the way in which material shapes the performance of a practice (Shove and Southerton, 2000; Shove, 2003; Shove, Pantzar and Watson, 2012; Spurling et al., 2013). In this research, the concept of script was a useful complement to the practice approach in order to conceptualise the way in which the new material infrastructure shaped the practice of urban transport cycling, the most obvious example being the way in which cycleway design scripted a reduction in cycling speed before crossings. However, some cyclists circumvented the cycleway scripts by cycling on the carriageway. Latour's (1991) concepts of programme of action and anti-programme were useful complements in the analysis, not only because they provided a label for the refusal to obey, but also because they bring to the forefront the potential contestedness of scripts and of the appropriate performance of the practice.

In the public discourse, cycleway projects were generally presented as interventions aimed at facilitating cycling. However, in this thesis I showed that cycleways were criticised

strongly by many cyclists because, according to them, cycleways did not facilitate cycling, but rather facilitated the flow of cars while marginalising the bicycle to a dysfunctional space. The cycleways also created expectations in drivers that cyclists would remain in that space. The cyclists who then circumvented the prescription of the cycleways by cycling on the carriageway, breached those expectations of drivers, which caused more conflicts. The notion of contested practice combined with the concepts of scripts, programmes and anti-programmes from actor-network-theory have provided a productive perspective for the analysis of the effect of urban infrastructure on the practice.

While practice research has recently started focusing on policy approaches and interventions (Shove, Pantzar and Watson, 2012), this effort has so far mostly been limited to the question of how interventions could potentially take effect. The question of how interventions are developed, planned and designed remains somewhat underexplored in practice research.

In chapter 6, I utilised a social-constructivist perspective and used the Social Construction of Technology approach from Science and Technology Studies (Pinch and Bijker, 1984) in order to analyse the development of cycleways. This approach acknowledges the political nature of infrastructure development and provision and especially focuses on the struggles between relevant social groups and their respective technological frames and thereby allowed me to trace the inherent conflicts of the practice in the development of interventions. As we have seen, the planning process, especially the criteria for the technical and the economic evaluation, resulted in infrastructure which prioritised facilitating car flow over increasing cycling rates. The infrastructure designs were shaped by myths about cycling and cyclists, which had been constructed by the collective experience of urban transport, which was dominated by the practice of driving. As a result, cycleways were an expression of the conflict between cycling and driving and the disagreement over the role of cycling in the urban transport system.

Finally, I used the concept of socio-technical systems (Geels, 2004), specifically Urry's (2004) concept of the 'system of automobility' to integrate the legal and institutional context in the analysis. The systems perspective elucidates why normalising and stabilising urban transport cycling is so difficult as it shows the many ways in which driving is anchored in the current mobility system and hinders the renaissance of cycling from its marginalised situation.

The notion of contested practice allows to trace conflicts through the genesis of the infrastructure and in the design of cycleways. This is significant because driving and cycling are in direct competition over public space as well as carriers. Facilitating car flow cannot be seen independently from cycling because it encroaches on the space of the practice. Equally, facilitating cycling can only be successful if driving can be restricted in terms of the use of public space as well as in political prioritisations which still persist in niches such as the evaluation methodology or the technical design guidelines. Taking into account the interplay of competing practices is, therefore, crucial for the development of interventions in the trajectories of practices.

8.2.2   Growing practice

This research suggests that it would be productive to rethink the general scepticism with regard to the creation of a community of practice. While a top-down approach to creating a community of practice might indeed be unrealistic, it would be useful to think about providing resources for organisations at the core of the community of practice to develop activities to create, consolidate and grow the community of practice in a bottom-up approach.

Practice theories conceptualise practices as inherently social phenomena (see chapter 2). Practices exist because they are performed by multiple carriers who share an understanding of what they are doing and saying. A community of practice then is the group of individuals who engage in the same practice. The significance of practice communities has been underlined with regard to innovations in practice, because they constrain or facilitate the diffusion of innovations (see Shove, Pantzar and Watson, 2012: 66).

Nevertheless, there is a general scepticism with regard to the policy strategy of growing a community of practice. Shove, Pantzar and Watson argue that '[t]he prospect of constructing and cultivating communities of practice [...] is alluring but it seems that the capacity to bring such networks into being, and to do so with any degree of success, is typically limited' (2012: 67). The authors here justify their scepticism with the observation that communities of practice do not necessarily mirror organisational structures. A community of practice can cut across organisations which makes it difficult for one organisation to create the conditions for the community of practice to prosper.

Wenger (1998) adds that communities of practice emerge from the mutual engagement in the practice. Practice and community constitute one another. Wenger argues that 'since the life of a community of practice as it unfolds is, in essence, produced by its members through their mutual engagement, it evolves in organic ways that tend to escape formal descriptions and control' (1998: 118). Wenger, therefore, agrees that a community of practice cannot be created by a top-down process because the organic ways in which the community develops through the mutual engagement of its members cannot be controlled.

Rather than focusing on top-down initiatives, this research focused on the activities of some organisations at the core of the community of practice itself. Growing practice therefore became the label for providing targeted support for individual carriers, based on a nuanced and contextually specific understanding of the practice and the potential difficulties of practicing urban transport cycling, as well as creating a community through generating spaces for mutual engagement and emotional support, negotiating a joint enterprise, establishing a shared repertoire, and reaching out beyond the community of practice to grow the community and to create positive images of the practice in the general population of the city. These activities appeared to be significant in the accounts of inexperienced as well as experienced urban transport cyclists.

Therefore, I argue that practice research might benefit from rethinking the general scepticism of an active cultivation of a community of practice. As was shown in chapter 7, the activities which I have labelled 'growing practice' sustain and further the organic growth of the community of practice. While expecting to be able to construct a community in a top-down approach might be problematic, growing practice through the bottom-up small-scale activities by the community itself, as I observed in Santiago, seems an effective approach to consolidate and grow this community of practice.

Also, this approach appears to be able to manage more successfully the inherent conflicts of the practice. The small scale of the activities involves small groups of actors who work closely together and develop a shared understanding of the practice and the intervention. Also, because these activities emerge from within the community and are mainly targeted at members of the community, they do not challenge driving as directly as the provision of infrastructure. Therefore, the development of the activities as well as the way in which they take effect may be more successful in managing the inherent conflicts of the practice.

It remains to be clarified what role public policy can play in growing practice. In Santiago, these activities were generally carried out by cycling organisations. To a certain extent some government-led initiatives could also be interpreted as growing practice, such as the Providencia public bicycle scheme, which provides bicycles as well as advice on cycling to its clients, as well as some collective cycle rides, which were organised by municipalities or the National Institute of Sports.

Nevertheless, in general civil society organisations were perceived to be better prepared to provide the targeted personal everyday support to individual cyclists. Firstly, the targeted support is too small-scale for a government body to cope. It is the personal scale which makes the activities effective and creates bonds between the carriers and thereby a community of practice. Secondly, the State might not be the adequate actor because of the hierarchical relationship to the people. The horizontal relationship between volunteers at cycling organisations and (potential) cyclists was generally seen to be more conducive to the full range of growing practice activities. Finally, the creation of community appears to be something that comes from within the group of carriers of the practice because that is where the shared knowledge and know-how exists. Therefore, these activities mainly emerged from civil society in a bottom-up approach.

A policy approach aimed at growing practice could focus on providing the conditions for civil society to create a community of practice in a bottom-up approach. This could be especially effective in the case of contested practices where common top-down government provision is contested.

8.3 Conclusion

This chapter aimed to discuss the empirical work with regard to its relevance for the body of practice theory. I have first shown that urban transport cycling in Santiago was a productive case study because it revealed the situatedness and contestedness of the practice in contrast to the ideal type conceptualisations of practices, communities of practice and the process of recruitment of carriers. Rather than arguing in favour of a change in those concepts and definitions, I argue that my research on urban transport cycling in Santiago suggests that practice research would benefit from a more relational perspective, which should take into account the relationships of the practice with the individual situated experience of its performance, the socio-technical system within which it is embedded and its competing practices. The analysis of interventions further added the

relationship of the practice with its material arrangement as well as the relationship between the practice and its community. These relationships are significant for the analysis of practices and interventions in the trajectory of a practice.

A relational perspective could safely take into account the individual experience as well as a systems perspective without losing its principal meso-level focus. Chapter 7 showed that the individual experience was significant because it was shared and the sharing of individual emotions, joys and fears, became a collective resource of the community of practice. The individual experience also helps to conceptualise innovation in performance as well as the negotiations of meanings within the community of practice. The systems perspective helps to understand the resilience of driving, even in times when the practice is seriously challenged by climate change, traffic congestion, air pollution and public health issues.

Following Watson's (2012) concept of systems of practice, the systems perspective also contributes to conceptualising relations between practices within the system. In the case of urban transport cycling in Santiago, I argued that the practice cannot be understood without taking into account the competitive relationship with driving and the urban transport system in which both practices are embedded.

The case study of urban transport cycling therefore has brought to the forefront the political and contested nature of practices which may so far have been underemphasised in the practice literature. However, I argue that a focus on interventions in the trajectories of practices requires an awareness of the inherent conflicts of a practice.

In the discussion of the building practice approach in the second part of this chapter, I argued that drawing on selected concepts of Science and Technology Studies in order to analyse the effect and the genesis of material interventions was a productive strategy. The concept of scripts (Akrich, 1992), programmes and anti-programmes (Latour, 1991) have been useful tools in order to understand the way architects scripted certain practice performances and the way some cyclists circumvented the prescriptions. Practice research and the Social Construction of Technology approach (Pinch and Bijker, 1984) constituted a productive combination in order to analyse the genesis of infrastructure interventions. Finally, the concept of socio-technical systems, produced and reproduced through practice, provided a useful perspective on the embeddedness of cycling and driving in the urban transport system.

Finally, the discussion of growing practice showed that the scepticism of the practice approach with regard to the growing of a community of practice may need rethinking. Instead of a top-down approach to cultivating a community of practice, this research has focused on activities which emerged from within the community of practice and which appeared to be effective in creating, consolidating as well as growing the community of practice. As these activities emerge from within the community of practice, policy approaches could aim to generate the conditions for these activities to take place.

Chapter 9: Conclusion

The aim of this research was to achieve a better understanding of interventions in the trajectories of practices and to contribute to practice theory and current debates on interventions in the trajectories of practices. On this basis, this research aimed to answer four research questions which focused on the nature of transport cycling in Santiago, the genesis of interventions, the effect of interventions, and the insights from the case study for theories of practice.

In the first part of this chapter, I will reply to each of the research questions on the basis of the empirical research and the theoretical discussion presented in the previous chapters. I will first argue that urban transport cycling in Santiago is a particularly contested practice. Disputes over the image of cycling and its role in the urban transport system, the competition with driving over carriers, public space and social status, and the disagreements among cyclists with regard to the rules for the performance have become an inherent part of the practice.

I will then turn to the two approaches to facilitating cycling which were identified in the empirical data. I will argue that building practice interventions are generated within the dominant system of automobility and produce infrastructure which reflects the competition with driving. Growing practice includes a variety of activities which provide targeted support for the everyday engagement in the practice. These activities emerge from within the core of the community of practice and contribute to its growth and consolidation.

Finally, I will argue that the case study of transport cycling in Santiago can make a contribution to practice theories bringing to the forefront a political and contentious nature of practices which has so far been underemphasised in the literature. Also, the research has shown the importance of the individual experience as well as the systems perspective in practice based empirical research. Furthermore, the research has introduced two types of interventions, building and growing practice. I will argue that the focus on the genesis of the interventions can contribute to the debate on how to intervene in practice trajectories and that the three selected concepts from Science and Technology Studies – scripts from actor-network-theory, the Social Construction of Technology approach, and the concept of socio-technical systems – can complement the practice approach in a productive way.

In the second part of this chapter, I will reflect on two limits of this research and propose two areas for further research. Apart from the limits of the research approach and methodology which I discussed in chapter 4, I will here reflect on the challenges of adapting research questions and methods in the course of the research and of interpreting the empirical data, both of which lie in nature of exploratory qualitative research. As to further research, I suggest a focus on the 'traditional cyclists', a group of cyclists who out of necessity always continued to cycle, even during the rapid expansion of driving in Santiago. This focus seems particularly useful to gain an understanding of the persistence of a practice under adverse conditions. It also seems particularly relevant from a social equality perspective to understand better the realities and needs of these cyclists, who are generally non-organised and therefore underrepresented in consultations on interventions. Secondly, I suggest a focus on women cyclists. In Santiago, there are far less women on bicycles than men. Apart from being an issue of social equality, this situation also impedes the normalisation of cycling. While research has been done on the barriers that keep women from cycling, the question has rarely been researched with a practice lens. Understanding the everyday realities of women, the practice bundles in which women are involved, their understanding of mobility and transport options, and the necessary reconciliation between the identities of being a woman and being a cyclist, might help to improve conditions for women cyclists, achieve a gender balance in cycling, and thereby normalise the practice throughout society. I will conclude this chapter with a remark on policy recommendations for facilitating a contested practice.

9.1 Research results

This part of the chapter will return to the four research questions and summarise the results of the empirical work in the chapters 5 to 7 and the theoretical discussion in chapter 8. The first section will focus on the first research question on the nature of transport cycling in Santiago. The second section will jointly address the second and the third research questions on the genesis and the effect of interventions in the trajectory of transport cycling in Santiago, first for the top-down interventions in the material arrangement labelled 'building practice' and then for the bottom-up interventions in the everyday practice of cycling labelled 'growing practice'. The third section will focus on the last research question concerning the contribution of the research to the body of practice theories.

9.1.1   Urban transport cycling as contested practice

The first research question was: What is transport cycling in Santiago? In chapter 5, I explored the practice of transport cycling in Santiago, the city within which the practice is embedded, its recent history, and the diversity and lived experience of its performance. I have argued that transport cycling in Santiago is a particularly *contested practice*.

The notion of contested practice emerged from the observation that transport cycling in Santiago is characterised by several inherent conflicts. First, in the general population of the city, the image of cycling is disputed. With the rise of car ownership during the military dictatorship, the car achieved a high social status, while the bicycle was marginalised as mode of transport exclusively for the poorest inhabitants of the city. At the time of the fieldwork, the image of cycling as mode of transport for the poorest had declined, albeit not disappeared, and several new images of the practice had emerged and are competing with one another. Cycling is newly perceived as a popular leisure activity in the wealthy areas of the city, as an environmentally-friendly and healthy mode of transport, as transport for young office professionals, but also as a risky and reckless practice, and even a practice that puts other people in danger through the disruption of traffic. Similarly, the role of cycling in the urban transport system is disputed. While for some cycling is only to be considered for small distances at low speed, others promote cycling as serious alternative to motorised transport.

Second, cycling competes with driving not only over carriers (see Watson, 2013), but also and significantly over public space. With the rapid rise of car ownership and the normalisation of driving during and after the military dictatorship, cycling has been marginalised in numbers of trips as well as public space. The spatial marginalisation takes effect through the layout of the city as well as the profiles of roads. Through the concentration of services in only a few municipalities in the centre of the city, and the growth of the city into the adjacent provinces, longer distances have to be travelled. The public space is primarily utilised to cope with ever greater numbers of cars, while bicycles are mostly squeezed against the curb or banned to narrow cycleways on the sidewalks or central reservations. In consequence, cycling is not only marginalised socially, but also spatially. This competition with driving produces harsh open conflicts.

Third, there is disagreement among cyclists as to the appropriate performance of urban transport cycling. The interviewees' accounts of cycling differed in the details of how they performed cycling and in the skills and tricks they used to negotiate traffic, what

understanding they had of their performance and the rules and norms the performance ought to follow. The most significant conflict among cyclists concerned the (lack of) space for cycling. Some cyclists were sufficiently confident and felt comfortable cycling in traffic while others preferred cycleways or the sidewalk. Therefore, there were conflicting views about the need for specialised cycling infrastructure as well as the question about whether cyclists should follow the Traffic Law, especially with regard to cycling on the sidewalk.

The notion of contested practice brings to the forefront the contentious and competitive nature of practices which has so far been underemphasised in the practice literature. Practices do not exist in isolation; they are embedded in arrangements of co-existing practices and technologies, and they compete with other practices over carriers, resources (for example space) and social status. The contested nature of practices is particularly visible in urban transport cycling in Santiago in 2011.

9.1.2   Building practice and growing practice

The next two research questions concerned interventions in the trajectory of the practice:

> 2. What kind of interventions in the trajectory of transport cycling can be observed in Santiago and how do these interventions take effect?
>
> 3. How are interventions developed, planned and designed?

These two questions present two sides of an intervention, the genesis and the effect (see figure 9-1). The research identified two approaches to facilitating urban transport cycling in Santiago. These have been termed building practice and growing practice. The research questions will be answered jointly first for the interventions categorised as building practice, the government-led provision of material infrastructure for cycling, and then for the activities grouped under the label growing practice, mainly civil society-led targeted support for individuals.
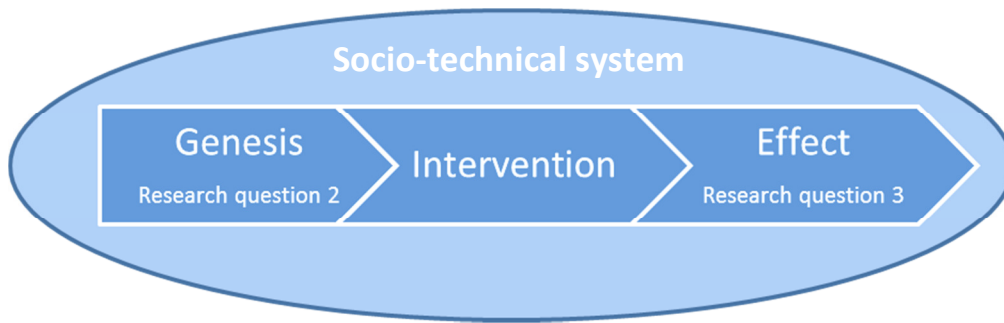
Figure 9-1: Genesis and effect as two sides of an intervention embedded in the socio-technical system.

9.1.2.1 Building practice

The building practice approach to facilitating cycling consisted in the provision of specialised cycling infrastructure in the form of cycleways. Cycleways provide a space for cycling. The empirical data showed that there was a broad demand for adequate conditions for cycling among cyclists and for many, especially less experienced or less confident urban cyclists, this meant segregated cycleways. Furthermore, it could be observed that cycleways were used, even when they were barely functional for the performance of transport cycling. Because the fear of motorised traffic is significant, less confident cyclists often trade comfort and speed for their own space. This fear is not an individual emotion, however, but a socially constructed phenomenon and (at least currently) part of the urban transport cycling practice. Therefore, cycleways serve the purpose of countering that collective fear. One might not be able to say that cycleways *facilitated* transport cycling, but they did indeed increase the participation in the practice.

The design of the cycleway scripts the performance of cycling, most importantly the location of the performance and cycling speed, both of which are contentious issues. Cycleways provide cyclists with 'safe' space for cycling, but at the same time make cyclists on the carriageway appear out of place. Since many experienced cyclists in Santiago preferred the carriageway to the cycleways for speedy transport cycling, cycleways actually weakened their position vis-à-vis motorised traffic. Furthermore, cycleway designs often neglected the need for speedy transport, especially the danger of spill-overs from pedestrians on to cycleways in parks or on the sidewalk, and cycleways were specifically designed to slow cyclists down at crossings. In this way, cycleways took effect in that they facilitated the flow of motorised traffic rather than the performance of cycling.

Finally, cycleways were effective in that they communicated to the wider population a political prioritisation through the investment and a certain image of the practice. Shove,

Pantzar and Watson state that 'governments have a hand in reproducing versions of normal and acceptable ways of life' (2012: 157). The provision of cycling infrastructure was often seen as sign of the political prioritisation of cycling which in some way legitimised and normalised the practice. Also, cycleways communicate an image of the practice. As we have seen, the Pocuro cycleway contributed to repositioning cycling in a wealthy context. In a similar way, the combination of parks, fitness equipment and cycleways often portrays cycling as recreational activity as opposed to transport. In this view, cycleways may have facilitated cycling in general, but also produced a new struggle for transport cyclists to distance themselves from leisure and sports cycling and an image of cycling linked to exercise and fitness which might put people off (see Aldred, 2013).

The analysis of the genesis of cycleways has shown that the dominance of driving shapes the planning and design of specialised cycling infrastructure, directly through regulations and standards and more subtly through general understandings and myths which shape the vision of particular plans and designs. The system of automobility was mirrored in the planning regulations and design guidelines. The prioritisation of driving is reflected in the economic evaluation of cycleway projects which uses travel time of car journeys as exclusive criterion, so that taking space away from the car resulted unprofitable. Furthermore the REDEVU design recommendations are mainly focused on facilitating the flow of cars.
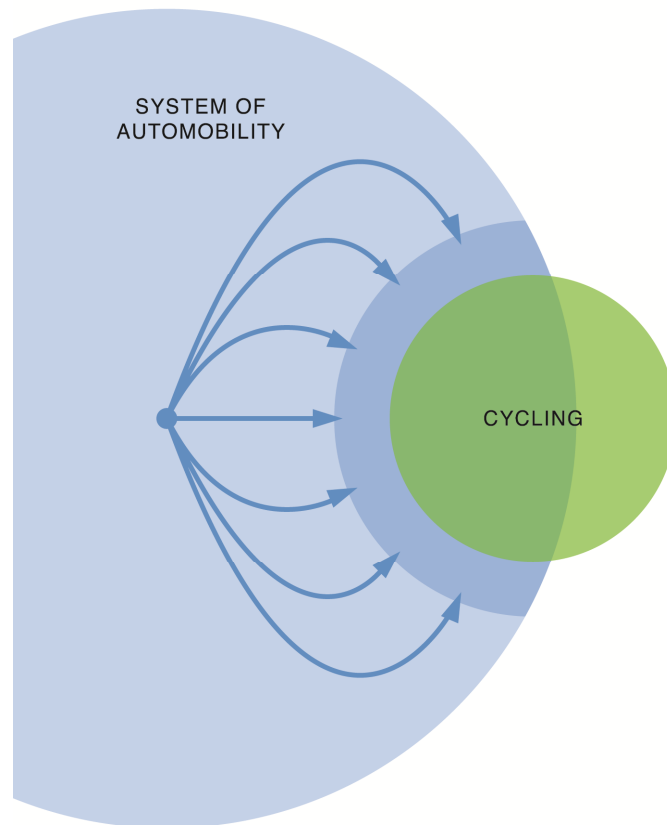
Figure 9-2: Building practice interventions emerge from the system of automobility.

Figure 9-2 summarises the genesis of building practice interventions. Through planning regulations and design guidelines the interventions emerge from the core of the system of automobility. They provide a space into which cycling can expand. However, the blue colour of the provided space symbolises that this space is still shaped by the dominant practice of driving.

The building practice approach is not a purely technical intervention, but rather a set of political negotiations in which practices compete with one another through regulations, guidelines, general understandings and constructed myths.

9.1.2.2   Growing practice

The growing practice approach consists of a variety of small-scale interventions in the everyday participation in the practice. The activities are mainly organised by civil society and provide targeted support to individual (potential) cyclists in order to overcome specific obstacles to cycling. I identified four principal areas in which cycling organisations provided support: acquiring a bicycle, bicycle maintenance and repairs, learning to ride a bicycle and cycling in urban traffic. In each of these areas the provided support was effective in that

the obstacle could mostly be overcome. However, anecdotal evidence showed that not all beneficiaries of these support activities became carriers of urban transport cycling.

The activities of cycling organisations additionally contributed to creating a community of practice. According to Wenger (1998) a community of practice is characterised by mutual engagement in the practice, the negotiation of a joint enterprise and a shared repertoire. Based on this concept of community of practice, I have argued that the activities of the cycling organisations created spaces for mutual engagement, in which they provided emotional support in the face of the risks associated with cycling. Furthermore, the educational activities and the mobilisations for a common cause can be interpreted as the negotiation of a joint enterprise and a contribution to generating a shared repertoire. Finally, the cycling organisations reached out beyond the community of practice not only to recruit, but also to shape the image of cycling.

Civil society activities were often dismissed as being small-scale and therefore insignificant in view of the need for systemic transition. The demand on the time of the experienced cyclists appears to limit the scope of this approach. However, systems theory as well as practice theories argue that change can happen in a non-linear way. Shove, Pantzar and Watson (2012) refer to positive feedback loops, while Urry (2004) describes tipping points which involve that dramatic changes can occur as response to small changes. Similarly, Schatzki argues that important changes are generated through multiple smaller changes and that 'the difference that any change makes to the world is open until the world responds' (2011: 25). While these theoretical approaches underline that the effect of policy interventions is unpredictable, they also give small-scale interventions a new importance.

As was shown in chapter 7, the effectiveness of the activities in providing targeted support for new cyclists as well as creating a community of practice was essentially based on the small-scale, personalised nature of the activities, which had been developed from an in-depth understanding of the practice and its potential points of failure. Additionally, beneficiaries could become multipliers of the practice and thereby further contribute to the growth of the community of practice. Growing practice interventions can therefore potentially contribute to a transition of the system of practices. However, it remains unpredictable if and when the system might reach a tipping point when 'velomobility' could displace automobility as dominant urban mobility system (see Watson, 2013).
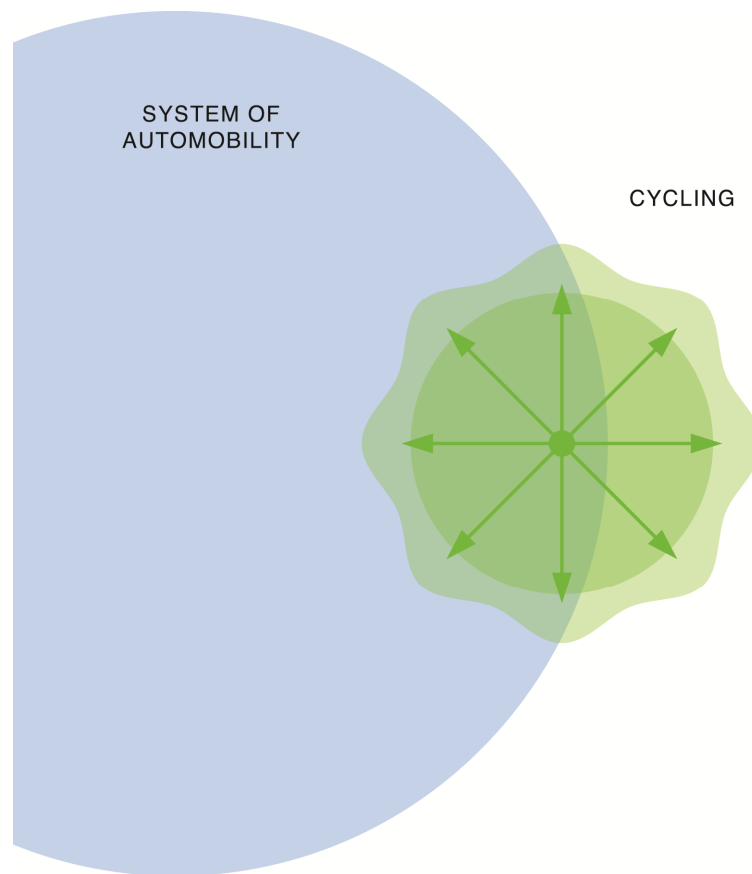
Figure 9-3: Growing practice activities emerge from the core of the community of cycling and expands the practice in all directions.

In terms of the genesis of the interventions in the trajectory of urban transport cycling, growing practice differs from building practice in that the interventions do not emerge from the system of automobility, but are produced by the community of practice itself. Figure 9-3 summarises the genesis of the growing practice approach. The interventions emerge from the core of the community and expand the practice. Contrary to figure 9-2 on the building practice approach, here the area of expansion is represented in green because the activities directly target the participation in the practice and are inherently linked to growing and consolidating the community of practice.

9.1.3   Contribution to practice theory

The fourth research question referred to a contribution to practice theory: What can the case of transport cycling in Santiago contribute to the conceptualisation of practices and current debates on interventions in the trajectory of a practice? In chapter 8, I discussed the implications of the empirical analysis for practice theory in detail. Therefore, I will only briefly reiterate the idea of a relational perspective for practice research and then address

the usefulness of the combination of practice theories and concepts from Science and Technology Studies.

In this thesis, I have argued that the case study of urban transport cycling in Santiago has shown the productivity of a relational perspective in practice research. First, in chapter 5, I introduced urban transport cycling as contested practice because the marginalisation of the practice through the emergence of driving had created conflicts between practices and within the community of practice. A focus on the relationship between urban transport cycling and driving therefore brought to the forefront the political and contested nature of practices which may so far have remained underexplored in practice research.

Second, I have argued that a relational perspective can contribute to connecting the individual situated experience, the meso-level practice approach and a systems perspective in a productive way. As was shown in chapter 7, individual situated experiences of the performance were significant for the negotiation of the meaning of the practice. They were shared among the community and could become a collective resource and thereby part of the shared repertoire of the community of practice. Furthermore, a relational perspective emphasises the embeddedness of practices in socio-technical systems. As was shown in chapters 5 and 6, urban transport cycling in Santiago was significantly shaped by the urban transport system in which it was embedded, including the material infrastructure, the traffic regulations and the institutional set up of the urban planning system, all of which contributed to shaping the individual situated experience of cycling as well as the understanding and image of the practice and its relationship to driving.

Third, a relational approach can also benefit the question whether a community of practice can be cultivated. The idea of creating a community of practice has generally been viewed critically (Wenger, 1998: 118; Shove, Pantzar and Watson, 2012: 67-68). This scepticism relates to a top-down approach to creating a community of practice. In view of the empirical data from the growing practice approach, I have argued that rethinking the scepticism about growing a community of practice could focus on the question of what governments could contribute to creating 'fertile' conditions for the community of practice to grow from within, as seen in chapter 7.

Finally, I would like to turn to the two fields of literature which I brought into dialogue in this research. This research combined the practice approach with concepts from Science and Technology Studies in order to analyse material interventions in the trajectory of urban

transport cycling. The concept of scripts (Akrich, 1992) as well as programmes and anti-programmes (Latour, 1991) from actor-network-theory helped to analyse the way in which material infrastructure acts upon the performance of cycling. The Social Construction of Technology Approach (Pinch and Bijker, 1994) made it possible to analyse the genesis of infrastructure interventions, acknowledging the political and contested nature of such interventions. Finally, socio-technical systems (Geels, 2004), especially the 'system of automobility' (Urry, 2004), allowed to analyse the practice of urban transport cycling and infrastructure interventions in the context of institutions, regulations, practices and understandings all centred in the dominant practice of driving. This research has therefore demonstrated a possibility to integrate these two fields of literature in a productive dialogue, which allowed tracing the contested nature of urban transport cycling through the infrastructure interventions.

9.2 Limitations of the research and outlook on further research

This part of the chapter will critically reflect on limitations of this research project as well as propose areas for further research. I will first reflect on the limitations of qualitative in-depth research on a single case. Then I will reflect on two challenges from the process of doing qualitative research: first, the need to adapt and revise the research questions and the research focus in the course of the research; and second, the problem of dealing with the wealth of data, interpreting the data and 'finding the story' for this thesis.

Then, I will discuss two questions, which were raised by the research but could not be covered in this thesis, as an outlook to further work. During the fieldwork, I noticed two particular groups of cyclists which deserve further attention: the traditional cyclists and women cyclists. Both groups are marginalised and politically underrepresented, the traditional cyclists because they come from lower income backgrounds and women cyclists because there are still deficiencies with regard to gender equality in Chile. From a social equality perspective, it would make sense to understand the experiences and the needs of these two groups in order to provide infrastructure and support which especially take these two groups into account. From a practice theoretical perspective, the traditional cyclists can provide insights about the survival of a practice under extremely adverse conditions, whereas women cyclists seem to be a key to the normalisation of the practice.

9.2.1 Limitations

This thesis is based on in-depth qualitative research of a single case: urban transport cycling in Santiago in 2011. The strength of this research approach lies in the production of thick descriptions of empirical material which contribute to creating a deep understanding of this particular case. However, while the situatedness of this knowledge is a strength, it is also the principal limitation of this research. As the research is based on only one particular city with its particular history, geography, culture and language, this research cannot provide simple generalisations or easily transferable policy recommendations. The relevance of this research with regard to other cities or other practices must carefully be assessed by the 'receiving context' (Erlandson et al., 1993: 32-33).

It is in the nature of exploratory qualitative research that surprises occur and adaptations have to be made. The observation that the practice was actively being 'grown' produced the most important change to the research. While I set out to look at the provision of infrastructure and made contact with the cycling organisations mainly in order to access a critical perspective on the provided infrastructure, I realised during the fieldwork the significance of the activities of these organisations. The discovery of this second approach to facilitating urban transport cycling in Santiago required an adaptation of my fieldwork focus, including additional interviews with cyclists who had benefitted from the activities of the cycling organisations and additional interview questions and conversations with the members of the cycling organisations. This hindsight leaves the author with the wish to have had the 'right' questions from the start.

Furthermore, it is in the nature of qualitative research, especially based on the combination of methods I used, that the wealth of data leaves room for interpretation. When I selected the case study of urban transport cycling in Santiago, the main criterion was which case would provide the richest data. In hindsight, the incredible wealth of data, which I was able to generate with my research participants, required me to choose a story to tell. This thesis is only one of many stories the data could have told, and it is a very personal story, shaped by my own experience of cycling and living in Santiago and by a deep sense of gratitude towards the participants of my research who offered me their time and shared their experiences and insights.

9.2.2 Practice survival through the traditional cyclists

While I have described several subgroups of the urban cycling community, there is one group which especially deserves further attention: the 'traditional cyclists'. 'Traditional cyclists' is a locally used phrase for a group of older cyclists from lower-income communities who mainly cycle out of necessity. The group of traditional cyclists mainly consists of factory workers and construction workers as well as some craftsmen and tradespeople. During the military dictatorship, they were not able to afford to participate in the general transition from cycling to driving and, therefore, kept the tradition of cycling alive. They are also sometimes referred to as 'heritage cyclists' as they are seen to form part of the local urban history and cityscape. Further research with this group of cyclists would be useful and relevant in order to understand the persistence of a marginalised practice under adverse conditions and to explore the possibilities for infrastructure provision and targeted support in these particular municipalities.

The traditional cyclists suffer the most precarious conditions for cycling. Many of these cyclists travel great distances and often cross several municipalities on their commute to work. Those who travel to factories often travel very early in the morning or late at night when it is dark because of the shift arrangements in factories. They travel in industrial zones of the city where they encounter a high amount of heavy vehicles on the roads, which largely do not have segregated cycling infrastructure. The traditional cyclists often cannot afford to invest in their own safety, for example in bicycle lights, reflective clothes or helmets. As helmets are obligatory in urban zones, a cyclist without a helmet cannot expect to win any legal process in the case of a crash with a car or lorry, even if the driver was at fault.

Although financial necessity and the lack of access to alternative modes of transport may explain why these people engage in cycling, a practice approach would suggest that decades of practicing cycling would create a shared understanding of the practice, and this might differ significantly from the understanding of cycling in other communities. Gaining a better understanding of the realities of the traditional cyclists and the meaning of cycling in their lives could shed light on how the practice remained alive under extremely adverse conditions during the period of the military dictatorship and is still maintaining its normality today.

Furthermore, these cyclists lack organisation and political weight and their realities remain underrepresented in the cyclists' lobbying. The political parties, unions and syndicates,

which could specifically represent the group of traditional cyclists, do not seem to have taken up the topic. At municipal level, we can observe a great difference between amount and quality of specialised cycling infrastructure. Finally, the actual lack of infrastructure in the lower income sectors of the city, where most cycling takes place, is also a sign of this political invisibility.

This work focused on interventions in the trajectories of practices and, therefore, on the organised cyclists which either engaged in political lobbying or carried out activities to facilitate cycling. The traditional cyclists, therefore, remained at the margins of this work. However, the underlying concern for sustainable urban development and therefore also social equality requires more research on the possibilities of intervention in order to facilitate equal cycling opportunities throughout the city.

9.2.3 Normalisation through women cyclists

Although the participant observation carried out at the Women's Cycling School introduced some gender-specific issues to this research, a specific gender focus was beyond the scope of this work. However, the research with the women from *Macleta* and the students of the Women's Cycling School made it clear that gender differences are significant for facilitating cycling.

The importance of increasing cycling rates of women has been established in several ways. Garrard, Handy and Dill (2012) argue that cycling benefits women especially because they are less likely to engage in sufficient physical exercise. Furthermore, women are disproportionately affected by 'transport poverty' (UN-Habitat, 2013). The bicycle as an economic mode of transport has the potential to improve the situation of those women. Additionally, this research has touched upon the emancipatory effect of learning how to ride a bicycle and achieving independent mobility. Several women at the Cycling School mentioned a gain in self-confidence. For the women of *Macleta* facilitating cycling was not only aimed at improvements in the environmental situation of the city, public health and urban poverty, but also as a means to more gender-equality in Chilean society.

Cycling statistics show that in cities with high overall rates of cycling the levels of participation of women and men in transport cycling are generally balanced, while in cities with low overall cycling rates the majority of transport cyclists are young to middle-aged men (Garrard, Handy and Dill, 2012). Therefore, high cycling rates of women can generally be interpreted as indicating bicycle-friendly environments (Baker, 2009).

In order to increase overall cycling levels, one approach has therefore been to explore why women do or do not cycle. Several reasons have been put forward for the difference in cycling levels between men and women, among which a general risk-adverse nature of women and their more complex travel patterns, including more 'serve-passenger trips', have been the two most quoted explanations (see Garrard, Handy and Dill, 2012 for a detailed analysis). However, while these differences explain lower women's cycling rates in general, they do not explain why their constraining effect is stronger in countries that have low overall levels of cycling than in countries that have high overall levels of cycling (ibid.).

The most common approach to increasing women's cycling rates is the provision of segregated cycleways which make women feel safe and which facilitate cycling with children and transporting big loads. However, infrastructure measures on their own have been shown to have limited effect (Pucher, Dill and Handy, 2010). While segregated cycleways lower the perceived risk of serious or fatal accidents, this strategy may not actually be as effective in increasing the cycling rates of women as expected. Garrard, Handy and Dill argue that the high risk of less serious incidents may actually affect the participation in the practice equally or even more than the smaller risk of serious or fatal accidents (2012: 224). The authors suggest viewing the traffic risk barrier as a 'risk iceberg' where the small number of fatalities only represent the tip of the iceberg which is followed by broadening layers of injuries of decreasing seriousness, then near misses and finally incidences of harassment (ibid.: 223). If this could be transferred to the Chilean context, reducing harassment and sexism against women cyclists might be a useful complementary strategy.

A more subtle but not less significant obstacle for the increase in women's cycling rates is the pressure on women to maintain a certain appearance. This exacerbates the worries about physical exercise in public, sweating, changing at work and also wearing safety clothes and a helmet (Horton, 2007; Aldred, 2012; 2013). *Cyclechic* has reacted to that pressure by introducing fashion compatible with cycling but has also exacerbated the situation of women who are now expected to look impeccable and sexy even when performing physical exercise. The reputational risk of cycling appears to be higher for women in Santiago than for men, and the car as 'private cocoon' (Urry, 2006: 24) naturally appears a safer option.

Practice research can contribute to this debate by focusing on the everyday realities of women's lives, the practices in which they participate, the travel requirements these

practices generate, their understanding of appropriate transport and appropriate behaviour in public, their identity and the image of cycling. Understanding the system of practice in which women are involved, might help to find effective measures to improve conditions for women cyclists, achieve a gender balance in cycling, and thereby normalise the practice throughout society.

9.3   Concluding remark: facilitating a contested practice

This research was motivated by a concern for sustainable urban development. The question remains how one can facilitate a contested practice, such as urban transport cycling in Santiago in 2011.

This research has shown that intervening in the trajectory of a practice is a complex undertaking. It differs drastically from the neatness of the linear-causal relationships of behavioural models, which are the basis for most policy interventions today. Intervening requires a much more refined understanding of the practice, the socio-technical system in which it is embedded, and the conflicts the practice endures. Schatzki argues: '[a]s for fostering sociotechnical change, this is an art born of experience and study. It requires, among other things, a knack for timing, insight into likely responses to activities and measures, and a sense of the range of histories and possibilities' (2011: 25). Still, the response to any intervention remains unpredictable.

However, there are certain tentative policy recommendations which emerge from this research. First, building practice and growing practice as distinct methods of facilitating cycling are not exclusive approaches, but complement each other. The research has shown the demand for infrastructure. Solutions have been elaborated by the civil society organisations, which include the provision of a coherent cycleway network combined with speed limitations, especially on local roads. However, this research has also shown that the provision of infrastructure is not a purely technical nor financial problem as often portrayed by transport engineers, but rather a contested political process shaped here by the dominant practice of driving embedded in the system of automobility. Therefore, the strategy to change the design manual as well as the efforts to create new criteria for the economic evaluation are fundamental steps to move towards more cycle-friendly infrastructure interventions. Furthermore, the participation of cycling organisations in the complete planning and design process may contribute to producing more adequate designs

which facilitate cycling, although the differences among cyclists with regard to infrastructure limit this approach.

Growing practice is targeted support and can simultaneously contribute to creating a community of practice. Systems theory as well as practice theory argue that change can occur in a non-linear way. Thereby, these theoretical approaches acknowledge that small interventions can have a great effect, because they can be 'contagious', and that therefore every small intervention can move the system closer to a potential tipping point. The relentless work of the cycling organisations, therefore, deserves recognition. As a community of practice can only be created in a bottom-up process, cooperation between governments and civil society and real support for the creation of a *civic* infrastructure might be an indirect but fruitful strategy to facilitate urban transport cycling. Support for the work of these cycling organisations could involve space resources as well as financial resources.

Finally, as could be seen in the literature review, some of the challenges identified in Santiago have been documented in other cities across the globe. While in accordance with naturalistic inquiry the transferability of these results remains to be evaluated by the receiving context, it seems that these results could be relevant for the challenge of increasing cycling in other cities and more generally for the question of how to facilitate sustainable practices.

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Annex 1: Interviewees

The following table presents socio-demographic data of the interviewees of this research. This table was added at the request of the examiners of this PhD. These data were not collected systematically and partly represent estimations. The data refer to the time of the fieldwork. In order to protect their anonymity, the interviewees are not listed in the chronological order of the interviews, but rather grouped according to the categorisation in chapter 4 and within the categories listed in the order of randomly generated ID numbers.

Activists					
ID	Gender	Age	Occupation	Level of Education	Relationship to the Practice
1264	man	25-40	Entrepreneur (cycling related)	Higher education	Member of a cycling organisation Experienced urban cyclist, high competence and confidence Bicycle business
1348	man	25-40	IT professional	Higher education	Member of a cycling organisation Experienced urban cyclist, high competence and confidence Skilled in bicycle mechanics
2345	man	25-40	Employee at a cycling organisation	unknown	Member of a cycling organisation
2376	man	25-40	Entrepreneur (non-cycling related)	Higher education	Member of a cycling organisation Experienced urban cyclist, high competence and confidence Former Government official, national level: promotion of cycling
2380	woman	45-60	Head of a cycling organisation	Higher education	Member of a cycling organisation Experienced urban cyclist, high competence and confidence Cycling research and consultancy
3579	man	60-75	Retired academic	Higher education	Member of a cycling organisation Experienced urban cyclist

ID	Gender	Age	Occupation	Level of Education	Relationship to the Practice
4076	man	30-45	Independent researcher	Higher education	Member of two cycling organisations Experienced urban cyclist, high competence and confidence Cycling research and consultancy
5478	woman	45-60	Head of a cycling organisation	Higher education	Member of a cycling organisation Experienced urban cyclist, high competence and confidence Cycling research and consultancy
6257	man	40-55	Bicycle mechanic	unknown	Member of two cycling organisations, Experienced urban cyclist, high competence and confidence Skilled in bicycle mechanics
6548	man	25-40	Employee at a cycling organisation	Higher education	Member of a cycling organisation Experienced urban cyclist, high competence and confidence
8642	woman	25-40	Independent researcher	Higher education	Member of two cycling organisations Experienced urban cyclist, high competence and confidence Cycling research
9865	man	20-30	University student	Currently in higher education	Member of a cycling organisation Experienced urban cyclist, high competence and confidence Plans for a bicycle business

Government officials, national and regional level

ID	Gender	Age	Occupation	Level of Education	Relationship to the Practice
2198	woman	35-50	Government official, regional level	Higher education	Strategic urban transport planning
2468	woman	30-45	Government official, national level	Higher education	Evaluation of cycleway projects
2687	man	45-60	Government official, national level	Higher education	Transport research
2688	man	40-55	Government official, national level	Higher education	Transport research

ID	Gender	Age	Occupation	Level of Education	Relationship to the Practice
2689	man	25-40	Government official, national level	Higher education	Transport research
3952	man	40-55	Former Government official, national level, consultant	Higher education	Transport research and consultancy
4627	man	35-50	Government official, regional level	Higher education	Strategic urban transport planning
4967	man	45-60	Former Government official, national level	Higher education	Strategic urban transport planning
5637	man	45-60	Government official, national level	Higher education	Strategic transport planning, initiatives to promote cycling
9514	man	45-60	Former Government official, regional level, consultant	Higher education	Cycle Route Master Plan
9564	man	40-55	Government official, national level	Higher education	Evaluation of cycleway projects

Government officials, local level

ID	Gender	Age	Occupation	Level of Education	Relationship to the Practice
2146	woman	40-55	Government official, local level	Higher education	Cycleway planning and design
2359	woman	40-55	Government official, local level	Higher education	Cycleway planning and design
3547	man	40-55	Government official, local level	Higher education	Public bicycle scheme
4267	man	40-55	Government official, local level	Higher education	Cycleway planning and design
4268	woman	35-50	Government official, local level	Higher education	Cycleway planning and design

ID	Gender	Age	Occupation	Level of Education	Relationship to the Practice
5283	man	40-55	Government official, local level	Higher education	Cycleway planning and design
5287	woman	40-55	Government official, local level	Higher education	Cycleway planning and design
6378	man	40-55	Government official, local level	Higher education	Cycleway planning and design
8765	man	>65	Retired Government official, local level, academic	Higher education	Cycleway planning and design

Beneficiaries/participants

ID	Gender	Age	Occupation	Level of Education	Relationship to the Practice
1748	woman	25-40	Employee at an environment consultancy	Higher education	Completed the 'Learn to ride' course at the Women´s Cycling School Beginner cyclist, aspiring urban transport cyclist, including work commutes
1985	man	45-60	Factory worker	unknown	Received a bicycle from Recicleta Experienced and confident urban cyclist
2461	woman	35-50	Entrepreneur (non-cycling related)	unknown	Completed the 'Learn to ride' course at the Women´s Cycling School Beginner cyclist
3249	man	20-30	University student	Currently in higher education	Assembled his bicycle at the Pedalea!Beauchef workshop Skilled in bicycle mechanics Experienced and confident urban cyclist
6527	man	20-30	University student	Currently in higher education	Assembled his bicycle at the Pedalea!Beauchef workshop Skilled in bicycle mechanics Experienced and confident urban cyclist
7548	woman	>60	Retired school teacher	Higher education	Completed the 'Learn to ride' course at the Women´s Cycling School Beginner cyclist

| 9812 | man | 45-60 | Concierge | unknown | Received a bicycle from Recicleta
Experienced urban cyclist, including long distances, not completely confident in traffic |
| 9814 | woman | 25-40 | Employee in a multi-national company (non-cycling related) | Higher education | Completed the 'Learn to ride' course at the Women's Cycling School
Beginner cyclist, aspiring urban transport cyclist for short utility trips |

Other					
ID	**Gender**	**Age**	**Occupation**	**Level of Education**	**Relationship to the Practice**
1268	man	25-40	Entrepreneur (cycling related)	Higher education	Public bicycle scheme Experienced and confident urban cyclist
1279	man	25-40	Entrepreneur (cycling related)	Higher education	Skilled in bicycle mechanics Experienced and confident urban cyclist
1594	man	30-45	Police officer	Higher education	Responsible for traffic education within police force and external Urban cyclist, not completely confident in traffic
3214	man	30-45	University administrator	Higher education	Responsible for promotion of safe cycling
3549	man	40-55	Academic	Higher education	Research about cycling, cycling infrastructure as well as cycling and public health
5147	woman	>60	Architect	Higher education	Cycleway design