HAL open science

Velonomy and material mobilities: Practices of cycle repair and maintenance in Lyon, France, and Melbourne, Australia

Margot Abord de Chatillon

To cite this version:

Margot Abord de Chatillon. Velonomy and material mobilities: Practices of cycle repair and maintenance in Lyon, France, and Melbourne, Australia. Sociology. École nationale des travaux publics de l'État (ENTPE), 2022. English. NNT : 2022ENTP0005 . tel-04096258v1

HAL Id: tel-04096258

https://hal.science/tel-04096258v1

Submitted on 12 May 2023 (v1), last revised 29 Aug 2023 (v2)

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International License

Thesis National Number: 2022ENTP0005

A THESIS OF ENTPE
Member of the Université de Lyon

Doctoral school ED483
Sciences Sociales

To obtain the graduation of
PhD in Sociology

Defended on December 12 2022 by
Margot Abord de Chatillon

Velonomy and material mobilities:
Practices of cycle repair and maintenance in Lyon, France, and Melbourne, Australia

---

In front of the following examination committee :

Rérat, Patrick, Professor, IGD, Université de Lausanne	Committee chair
Gallez, Caroline, DR, LVMT, Université Gustave Eiffel	Reviewer
Papon, Francis, IPEF, DR, AME/DEST, Université Gustave Eiffel	Reviewer
Sahakian, Marlyne, Associate professor, Département de sociologie, Université de Genève	Examiner
Batterbury, Simon, Associate professor, School of Geography, University of Melbourne	Examiner
Ortar, Nathalie, DR, LAET, ENTPE	Supervisor
Cox, Peter, Professor, University of Chester	Co-supervisor

Numéro national de thèse (NNT) : 2022ENTP0005

THÈSE DE DOCTORAT DE L'ENTPE
Membre de l'Université de Lyon

École Doctorale N° 483
Sciences sociales

Discipline de doctorat :
Sociologie

Soutenue publiquement le 12/12/2022, par :
Margot Abord de Chatillon

Vélonomie et matérialité des mobilités :
Pratiques de mécanique vélo à Lyon, France et Melbourne, Australie

---

Devant le jury composé de :

Rérat, Patrick, Professeur, IGD, Université de Lausanne	Président
Gallez, Caroline, DR, LVMT, Université Gustave Eiffel	Rapporteure
Papon, Francis, IPEF, DR, AME/DEST, Université Gustave Eiffel	Rapporteur
Sahakian, Marlyne, maître de conférences, Département de sociologie, Université de Genève	Examinatrice
Batterbury, Simon, maître de conférences, School of Geography, Université de Melbourne	Examinateur
Ortar, Nathalie, DR, LAET, ENTPE	Directrice de thèse
Cox, Peter, Professeur, Université de Chester	Co-directeur de thèse

Acknowledgements

Much like the cycling and repair operations it investigates, this thesis has been a collective enterprise. I first wish to thank my supervisor, Peter Cox, for his insightful comments, love of theory, intricate knowledge of cycle design history studies, and his very supportive encouragement in all circumstances. I also wish to thank Luca Bertolini, who supervised my Master's thesis in 2016 and taught me then many useful research skills.

I am grateful to all participants involved in this study, as well as to the community workshops and cycle shops that opened their doors to my curious self; this was highly appreciated. I would like to thank all volunteers and organisers of WeCycle and the Bicycle Hospital (Flemington), for the warm welcome and pleasant experiences of collective repair that they offered me. I would like to thank the members of the organisation Bike@Work, including Adeo, for supporting me in my wild and ultimately unrealistic plan to film a documentary. Thank you also to the joyful volunteers at the Melbourne University bike co-op, which was my introduction to cycle repair, and to Brody, for helping me discover feminist repair activism.

Thank you to the THUD Research lab at Melbourne university, for insightful conversations and introducing me to some study participants.

Some people volunteered some of their precious time to test the cycle repair survey: thank you to Daniel, Blanche, Cedar, Jean, Louise, Jae, Ruby, and Adeo for this much-appreciated and very important assistance.

Some people have given valuable scientific feedback on this manuscript: Nikki Pugh in particular has been extremely supportive on many levels over the previous years. I believe that this thesis is considerably transformed by her great advice, in terms of both the content and the formatting. I would like to thank Daniel Valentini for his feedback on Chapter II.

My warm living environment and supportive friendships have been instrumental in helping me to actively engage with research in Melbourne, a city so far from my home. I would like to thank the inhabitants of the Greater Daly, musicians from the Riff Raff Radical marching band, and my beloved friends Ruby, Sophia, Tali, and Blanche.

During the time I spent writing this thesis, Melbourne cycling activists have experienced two terrible losses: here, I would like to name Georgie Fyfe-Jamieson and Peter Moore. Both of them were extremely helpful and kind to me during this study, and I know that, in their lifetimes, they have transformed the Melbourne cycling and repair ecosystem beyond words.

Remerciements

Je voudrais remercier ma directrice de thèse, Nathalie Ortar, pour sa présence et son suivi attentif tout au long de la thèse. Merci au LAET pour le cadre bienveillant dans lequel cette thèse a pu se dérouler, merci à mes co-bureaux du T125, et merci aux doctorant-es du laboratoire pour avoir contribué à un environnement convivial, notamment grâce à la tenue du Divan des Doctorants. Merci à Chloé pour les lectures de dernière seconde.

Merci à toutes les personnes qui ont répondu à cette enquête, accepté de participer à un entretien, ou qui m'ont ouvert les portes d'un magasin ou d'un atelier vélo. J'apprécie l'effort que cela représente, dans des magasins souvent très chargés et des ateliers bombardés de sollicitations médiatiques. L'atelier du Chat Perché a été un lieu très important pour la réalisation de ce travail, et aussi un lieu qui m'a beaucoup appris, que ce soit humainement, politiquement ou mécaniquement. Merci aux salarié-es, bénévoles, membres du CA, Félines et adhérent-es de ce lieu pour leur accueil.

J'ai beaucoup appris de ma collaboration scientifique avec Manon Eskenazi, que je souhaiterais aussi remercier chaleureusement. Merci aussi à Anaïs Choulet-Vallet et Lola Sinoimeri pour leurs retours sur le résumé en français de la thèse.

La conception du questionnaire utilisé dans cette thèse a été rendue possible par le soutien de plusieurs personnes qui l'ont relu à diverses étapes. Je suis reconnaissante à Matthieu, Ayman, Pascal et Nathalie pour leur contribution à cette réalisation, ainsi que toutes les personnes qui ont relu ou testé ce questionnaire : Candy, Stophe, Diane, Mélanie, Morgane, Annette, Juliette et Manon.

Enfin, merci aux personnes que j'ai le plaisir de fréquenter dans mon quotidien en France et à Lyon : notamment les habitants du 9, les fanfares, le desk et les lesbiennes politiques de la collective, et bien sûr Lola.

Mon travail a aussi été facilité par les initiatives de science ouverte : je souhaiterais remercier les contributeur-ices de Wikipedia, HAL et la plateforme Sci-Hub.

Table of Contents

ACKNOWLEDGEMENTS 5

REMERCIEMENTS 7

TABLE OF CONTENTS 9

INTRODUCTION 15

Essential Repair 19

Towards a Cycling Society 20

Waste and the Life Cycle of Daily Objects 22

Working with Physical Things and the Joy of Touch 24

Existing Studies of Cycle Repair 26

Research Questions 29

CHAPTER I: CASES AND METHODS 35

1. Comparing Two Cities 36

1.a. The Comparative Approach 36

1.b. Similarities and Differences between Lyon and Melbourne 38

1.c. Cycling Practices in Lyon and Melbourne 44

1.d. Community Workshops in Lyon and Melbourne 47

2. Steps of the Research 52

2.a. Use of a Mixed-methods Approach to Better Apprehend Material Culture and the Urban Cycle Repair Ecosystem 52

2.b. Survey Design and Collection 54

2.c. Interview Design and Collection 58
2.d. Multi-sited Ethnography: Constructing the City of Repair 60
3. Participating in Research and Transformations 65
3.a. Participant Observation and Auto-ethnographical Research 65
3.b. Engaging with the Cycling Community 70
3.c. The Role of the Researcher 74
3.d. The Cycle as a Material Involvement in Research 76
Conclusion 78
CHAPTER II: DEFINING REPAIR 80
1. The Blurriness of Cycle Repair and Breakdown 83
1.a. Characterising Repair and Maintenance 83
1.b. Characterising Breakdown 97
1.c. Co-defining Repair and Breakdown 107
2. Inside the Repair Experience 114
2.a. The Availability of Tools and Repair Skills 114
2.b. Struggles and Joys of Repair in Practice 123
3. Sharing Repair 135
3.a. Repairing versus Maintaining 135
3.b. Repair Actors and the Share of Repair 144
3.c. The Service and Redistributing Repair Responsibility 153
Conclusion 159
CHAPTER III: THE CYCLE-CYCLIST RELATIONSHIP 162
1. The Model of Material Possessions and Dimensions of Cycle Use 164
1.a. Discussing the Cycle as a Material Object 164

1.b. The Affective Dimension: Loving One's Cycle 173

1.c. The Symbolic Dimension: Being Proud of One's Cycle 179

1.d. The Instrumental Dimension: Using One's Cycle 185

2. Beyond Dimensions – Towards Material Interactions 197

2.a. The Limitations of Separate Dimensions 197

2.b. A Common Cycle: Aggregating Repair and Cycling Practices 206

2.c. The Evolving Cycle–cyclist Relationship 216

2.d. Using the Cycle, Making the Social 219

3. Velonomy: Making the Cycle–cyclist Relationship Political 228

3.a. Velonomy – From Activism to Science 228

3.b. Velonomy as a Political Relationship for Cyclists and Society 232

3.c. Velonomy as a Process 241

3.d. Velonomy within a Society 249

Conclusion 258

CHAPTER IV: VELONOMY IN A CONSUMER SOCIETY 261

1. The Cycle as a Consumer Object 263

1.a. The Cycle as a Disposable Good 263

1.b. The Planned Obsolescence of Cycles 272

1.c. Repair as a Merchant Operation 281

2. Income Inequalities and Velonomy 285

2.a. Poverty and Mobility Justice in Cycling 285

2.b. Different Income Levels, Different Cycle Repair and Maintenance Practices 288

2.c. Different Income Levels, Different Representations of Repair and Maintenance 296

2.d. Lyon and Melbourne: Two Cities where Income and Repair have Different Meanings

301

3. The Velonomy of the Cycle Repair Ecosystem 306

3.a. Towards a Repair Ecosystem 306

3.b. The Velonomy of Self-repair Workshops 314

3.c. Cycle Shops and the Struggle for Velonomy 328

Conclusion 340

CHAPTER V: GENDERED VELONOMIES 343

1. 1. A Gendered Relationship with Cycling 346

1.a. Gender Issues in Cycling 346

1.b. A Gendered Relationship with the Cycle as an Object 351

1.c. The Gendered Share of Material Interactions within Heterosexual Households 360

2. Gendered Repair and Maintenance Practices 366

2.a. Gendered Repair and Maintenance Practices: Overview 366

2.b. Repair Spaces as a Patriarchal Environment 371

2.c. The Production of Feminine Velonomy 376

2.d. Gendered Repair within the Household 382

3. Reappropriating One's Cycle 386

3.a. Gender Power Relations as a Script 386

3.b. Individually: Transforming One's Relationship with the Cycle 387

3.b. Collectively: Feminist Initiatives and Collective Velonomy 392

Conclusion 402

CONCLUSION 405

REFERENCES 413

RESUME DE LA THESE EN FRANCAIS 447

LIST OF TABLES 457

LIST OF FIGURES 459

APPENDIX 463

Appendix 1 – Questions of the Cycle Repair Survey 463

Appendix 2 – Uses of the Term "Velonomy" in French Activist Circles 473

Appendix 3 – Equivalence between Income Quintiles in France and Australia 475

Introduction

"I ponder of something great
My lungs will fill and then deflate
They fill with fire, exhale desire
I know it's dire, my time today

I have these thoughts so often, I ought
To replace that slot with what I once bought
'Cause somebody stole my car radio
And now I just sit in silence"

Twenty-one pilots, "Car radio", 2011

This thesis presents an interdisciplinary study of cycle repair and maintenance practices in the cities of Lyon and Melbourne. This study stems from my own experience: cycle repair is something that I experienced in person before beginning to approach it in a theoretical way. For this reason, I wish to introduce this thesis with a brief overview of my own experiences of cycle repair.

The first time I moved to Melbourne, as part of a university exchange program, I spent my first week in the city in search of an affordable cycle. On welcome day, international students like myself had been advised to visit the local community workshop, the CERES[1] bike shed. However, there was a catch to the affordability of the cycles found there: you had to repair them yourself before you could purchase them. Following the instructions indicated on the workshop's website, I found an outfit that I did not mind getting dirty and prepared myself mentally for what I anticipated might be a long and difficult repair session. I arrived at this gorgeous place – located in the middle of a community garden, full of old wheels and rusty bolts – and introduced myself to the first workshop volunteer who caught my eye, who immediately

[1] CERES stands for "Center for Education and Research in Environmental Strategies". More information about the CERES environmental park can be found on the website https://ceres.org.au/

brought a bike over to me. “You can have this one”, he said, “one of our volunteers had too much free time and fixed it already, and I believe it’s your size”. Happy, but also a little disappointed, I decided that I would still work on this cycle, and spent several exhausting hours adding a luggage rack to it. At the time, it felt ridiculous that it had taken me zero minutes to “repair” the bike, but hours to make a small addition to it. Despite the irony of this, I was very proud of myself, and this moment had a powerful impact on me, something that became apparent when the shelf in my new room turned out to be wobbly: “I can fix this”, I thought, with a determination I did not know existed in me. This determination faded after a few days, but what remained was the impression that cycle repair had the power to challenge aspects of myself in interesting ways, and that I wanted to know more about it.

I ended up riding this same cycle throughout the duration of my five-month stay in Melbourne, and grew quite fond of it. I am a very tall person, and it was a very tall cycle, its frame a somewhat peculiar shade of grey that verged on green. Its luggage rack fulfilled its role perfectly: my cycle always got me where I wanted to go, and that was all I needed (Figure 0.1). I left Melbourne at the end of the semester, and when I came back one year later for my PhD fieldwork, it was still there, waiting for me in a shed. I used it for a few more months; it broke down regularly, in ways that were not very concerning but afforded me the opportunity to engage with diverse repair skills and repair spaces, something that later became useful in the context of my research.

Figure 0.1 - My greenish-grey cycle

Sometimes, I would have to ride another cycle, and coming back to my own cycle felt like a relief: it felt like it was made for my legs, and that my body knew it in intimate detail.

A few days before the flight that would once again take me away from Australia, my rear derailleur broke, and a friend advised that I implement a temporary fix, sending me a video in which a mechanic briefly described each step of the repair. This was a low-budget hack that involved removing the need for a functional derailleur by bypassing this component entirely, detaching the resulting surplus length of chain, and turning my cycle into a single-speed cycle. It worked, and I felt great relief when I could ride my dear cycle again. However, the rear derailleur is not only part of the gear-changing mechanism, but also maintains the chain tension – a function that was still necessary in this case. After a couple of peaceful trips, during one journey, the chain suddenly jumped from one gear cog to a larger one, bringing me to a sudden stop. Further exploration showed that the chain was under a huge amount of tension: I could

not move it an inch, all the components were completely jammed, and the back wheel did not move at all. I was able to borrow another cycle, but needed to keep my lock with me to use with the replacement cycle. I therefore decided to leave my cycle unlocked in the street, doubting that anyone would steal an old peculiar-shade-of-grey-verging-on-green cycle with no derailleur and a completely jammed back wheel, and resolving to come back the following day and take it to the community workshop (where it had all begun) for repair or rehoming. However, when I arrived the next morning, it was already gone.

A few hours later, I left Melbourne while feeling torn about my relationship with my now-disappeared – probably stolen - cycle. On the one hand, all was well, since someone else would get to ride a great cycle in my absence; I hoped that my cycle would carry tall cyclists around Melbourne for many more years, or that its parts would contribute to the repair of others that would achieve the same goal. On the other hand, I felt as though I had unfairly given up on my companion. I had abandoned it, as if a broken derailleur meant the end of it all; I had shown a lack of faith in the machine that had been so reliable in the past. Besides, in a strangely selfish and possessive way, I would have found it apt if my departure also coincided with the end the relationship between my cycle and myself. I had wanted to be the one to guide it into its next stage of life, and the opportunity for this ceremonial action had been taken away from me.

As indicated by this story of my greenish-grey Melbourne cycle, repair has an impact on cyclists: it transforms them, just as they transform their cycles. Moments of repair practices are embedded with the most important moments of the relationship that cyclists develop and maintain with their cycles, with their daily lives and their longer-term projects. This story also highlights the frustrating aspect of repair practices, which are difficult and present no certainty regarding their results, especially when one is not very experienced in repair – as is the case for many cyclists, including me. Moments of repair can be moments of great achievement, doubt, pride, or failure. Due to the unpredictability of many cycle breakdowns, repair often occurs at inconvenient times, when we are not ready for it. The vulnerability that may be experienced during repair is also tightly linked to our feeling of autonomy – not only as a cyclist, but also as

a person in a society full of tools, material objects, machines, and merchandise.

Even now, I never get bored when listening to other people's cycle repair stories. One aim of this research was to convey these stories and to reflect on them in a human and compelling way. This is what I aim to do in this thesis through focusing on and attending to cycle repair and the materialities of cycling, as documented through quantitative and qualitative research conducted in the cities of Lyon (France) and Melbourne (Australia).

Essential Repair

The impetus to write this thesis emerged from a strong desire to understand what exactly cycle repair is and how it transforms the world. Repair is everywhere in the lives of cyclists: breakdowns are commonplace and often unpredictable, and many cyclists consider it extremely shameful to lack the ability to repair a puncture (Aldred 2013a). However, while cycle repair soon became both fascinating to my academic self and essential to my cycle-using self, I also learned that many people did not care about it at all. Spaces in which repair is taught are scarce, and it is extremely rare for media discourses around cycling, or policies that aim to develop cycling, to take repair into account. This lack of interest is a phenomenon well- known to repair scholars:

> If the everyday routines of work are so dependent on repair for the continued maintenance of social order, we would expect that repair skills should be highly visible in their practice. Paradoxically, however, those things which are most vital for basic aspects of social interaction tend to be the things that are most invisible. (Henke 2000: 69)

As a researcher, it may feel exciting to dive into things that are not the usual focus of popular or academic attention. However, there can also be a downside to this: in the course of writing this thesis, I became accustomed to frequently being asked, both within and outside of academic circles, what the point of all this was. However, this academic interest is anchored in the strong social significance of cycle repair practices. Cycle repair is an essential element of cycling and

of developing sustainable forms of urban transportation. It also questions the contemporary relationship between consumers and waste. Moreover, it draws focus to the role of tools and material objects in social life. These three aspects of cycle repair are addressed by several academic disciplines and fields of research, to which this thesis contributes.

Towards a Cycling Society

The first reason for stating the importance of repair is the importance of cycling. There is now a strong scientific consensus established within urban planning and transportation research regarding the many benefits of cycling. First, it is beneficial to the physical and mental health of those who engage in it (Department of Health 2011; Oja et al. 2011). The environmental impacts of cycling are also very positive (Papon and Dusong 2016), since the development of the cycling modal share in cities is linked to improvements in the respiratory health of inhabitants (T. Boyce and Patel 2009) and a decrease in road accidents (Allen and Allen 2015). Moreover, cycling is considered to have a positive social impact, by reducing inequities and transforming the ways in which cyclists interact with their environment (Héran 1995; te Brömmelstroet et al. 2017). We should be wary about considering the cycle to be a morally just mode of transportation, as it can also be a lever for unequal or discriminatory dynamics (Stehlin 2019; Adam 2021); despite this, the cycle remains an affordable means of transportation that is less costly for individuals and that often travels as fast as a car in an urban setting (Guidez, Hubert, and Mermoud 2003; Rajé and Saffrey 2016).

It is now widely known that reducing the modal share of the car while developing sustainable transport and cycling modal share should be a priority of local governments in the 21st century (Banister 2005; Gallez 2015). Indeed, current cycling research is more preoccupied with how to develop cycling rather than why, with a strong focus on the environmental determinants of cycling, particularly the presence (or lack thereof) of cycling infrastructure and its quality (Nello-Deakin 2020).

Figure 0.2 – An element of the Système vélo: Sign on the floor signalling the proximity of a cycling repair station with available tools and pump, Melbourne.

Beyond cycle lanes, cycling can be understood as part of a "cycling system" (système vélo in French), detailing how, as with driving (Urry 2004), cycling practices rely on the constitution of a system comprising diverse elements, all of which enable and facilitate cycling at their own level (Héran 2019). This is an approach developed by research in geography, as well as by mobilities scholars (Sheller and Urry 2016), who focus on mobilities as they are constituted of complex social systems (Randell 2020). Système vélo was a term adopted by French cycling

activists, since it allowed them to lobby for the development of cycling at many different levels: advocating for safe infrastructure, arguing for the ability to park cycles at train stations (Papon et al. 2016), working towards the development of urban facilities related to cycle repair (Figure 0.2), contributing to the fight against cycle theft, demanding convenient and secure cycle parking, etc.

Repair is an important aspect of the development of cycling, a practice that requires a cycle to be in an adequate condition. Any functioning cycle has either already been repaired or maintained, or will have to be in the not-too-distant future (Graham and Thrift 2007). Repair is not often in play during the acquisition of a new cycle, but inevitably becomes necessary at a later point. Repair is thus essential to sustaining the practice of cycling; accordingly, a political focus on repair is key to achieving an effective and efficient modal shift away from driving and towards cycling (Bruno and Nikolaeva 2020).

Waste and the Life Cycle of Daily Objects

Besides being central to the maintenance of cycling practices, cycle repair is also an essential element of the environmental impact of cycling. The study of this environmental impact is carried out through research in a range of different fields, such as discard studies and sociology of consumption.

Indeed, cycling is considered a quintessentially environmentally friendly practice, especially in the case of non-electric cycles that require no additional energy consumption (aside from the cyclist's efforts) during their use. Life-cycle analyses demonstrate that the cycle has a significantly smaller carbon footprint than the car, especially when the cycle in question is not electrically assisted (Cherry, Weinert, and Xinmiao 2009; P. Roy, Miah, and Zafar 2019). However, the environmental impact of the cycle is still non-negligible, although its primary impact occurs at the production stage (Coelho and Almeida 2015), which means that length of cycle ownership is a determining factor in the overall extent of environmental impact. Thus, repairing a cycle rather than throwing it away, or maintaining it in order to extend its life span, is generally considered to be an environmentally positive gesture.

In reality, cycle repair itself is a practice that involves the consumption and waste of huge quantities of materials and parts. For example, cycle shops typically choose to replace rather than repair inner tubes following a puncture, which leads to the disposal of huge quantities of rubber. Inner tubes and tyres are almost always disposed of and incinerated, since the infrastructure and technology required for the recycling of these items remains at the embryonic stage.

Figure 0.3 – "Brake pads: When it's worn, bin it!": sign in a community workshop, Lyon

Even community workshops, which usually choose to repair punctured inner tubes and to re-use second-hand parts and materials, end up throwing away huge quantities of cycle components and frames on a regular basis (Figure 0.3). A consideration of the environmental impacts and benefits of cycling should thus also include repair and maintenance practices.

Working with Physical Things and the Joy of Touch

A third contribution of the academic study of cycle repair is the powerful insights that are enabled by a focus on the material interactions that cyclists have with cycles. Social life is constituted by the many interactions that individuals have with material objects (Dant 2005). A deeper exploration of these material interactions is essential for unravelling the many ways in which objects shape and transform the social world.

Discussions of cycling rarely consider the materiality of the cycle itself. However, mobilities studies have increasingly focused on cycling as a very specific material interaction with a machine: one that can elicit many sensorial stimulations (M. Cook and Edensor 2017), from comfort and joy (Cox 2019) to pain or exhaustion (Spinney 2006; Popan 2019). As shown by the story of the greenish-grey cycle related at the beginning of this introduction, repair is a practice that can invoke strong feelings and memories. It is an (often stationary) embodied sensorial experience that completes the (often moving) embodied sensorial experience of cycling. As highlighted by the academic disciplines of anthropology, by science and technology studies, and by the field of maintenance studies, the work of repair comes with a wide range of sensory impressions (Figure 0.4): a focus on sound (Krebs 2012), an embodied ease with tools (Dant 2005), and the centrality of certain kinds of attention (Denis and Pontille 2020b) as they culminate in the specific moment of diagnosis, among others (Dant 2010).

Focusing on repair has the power to draw our attention to the essential roles played by material and technical objects in our daily lives. This is why studies of repair have provided some of the most compelling ethnographic accounts of work and technology (Strebel, Bovet, and Sormani 2019). It is also a focus that allows for detailed examination of the use of material and technical objects, including their accessibility and the purposes for which they are used.

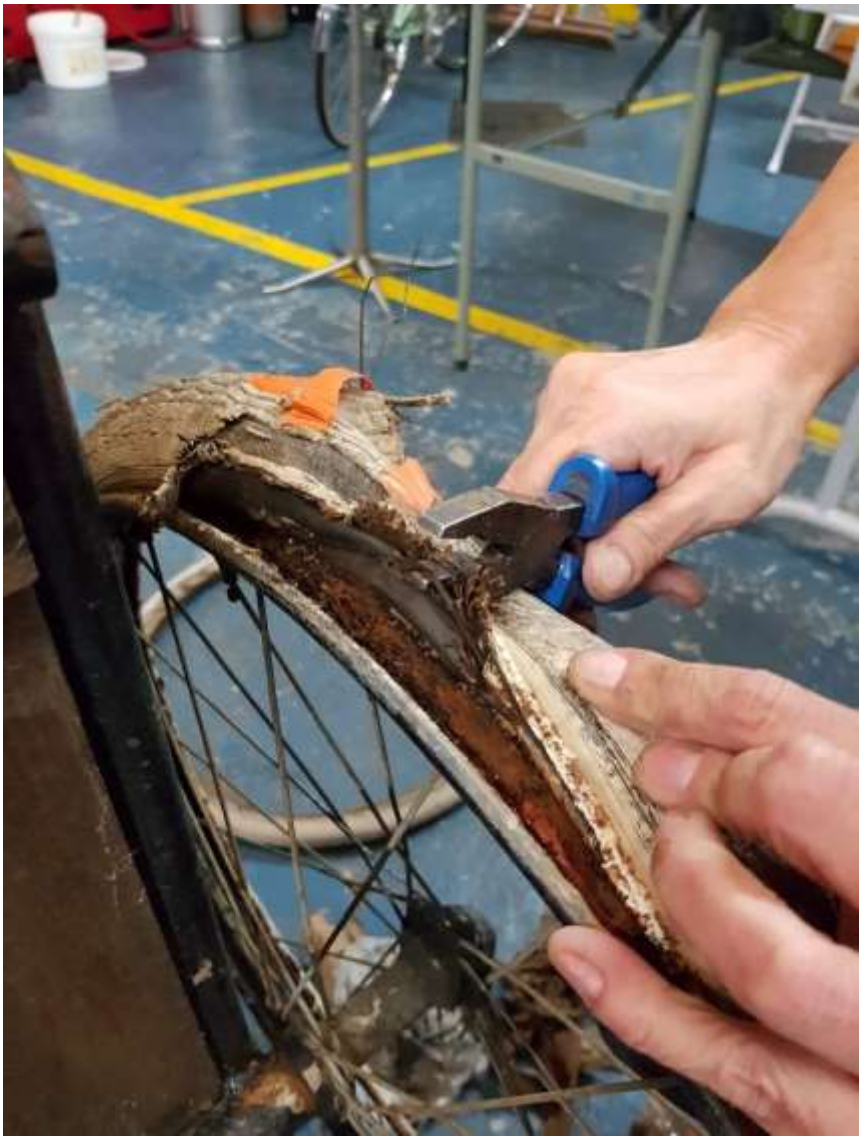


Figure 0.4 – Breaking the threads of a very old tyre in order to extract the inner tube from the wheel, Lyon

A key choice made in this thesis was to study repair practices through a comparative study conducted in the cities of Lyon, France and Melbourne, Australia. They are both major cities in an affluent country, and display equivalent (rather low) cycling rates. They are characterised by strong differences in urban morphology (with Lyon being far denser than Melbourne), as well as history: France has been a colonial power, whereas Melbourne was founded by settlers. They are home to different cycling cultures (with a stronger focus on cycling for sport in Australia

than in France), and different material cultures (with second-hand cycles and parts being more widely available and used in France than in Australia). This comparative approach permits a deeper understanding of repair and maintenance practices, through apprehending the different contexts in which these practices occur.[2]

Several aspects of cycle repair practices have already been addressed in previous research. The next section of this introduction presents the existing studies of cycle repair.

Existing Studies of Cycle Repair

A Strong Focus on Community Workshops

The study of cycle repair is located at the intersection of the academic fields of cycling studies and maintenance studies. Despite the growing popularity of both of these fields (Dill 2019; Denis and Pontille 2020a), with their frequent interdisciplinary contributions, and the creation and development of dynamic research networks, no comprehensive academic research focusing on the practices and implications of cycle repair has yet been conducted.

Some researchers have previously drawn attention to specific aspects of cycle repair practices. For example, Martin Tironi developed an ethnographic study of the daily maintenance work around Vélib', the public cycle share program in Paris (2019), while Tim Dant has explored the phenomenon of online cycle repair tutorial videos, with a specific focus on the maintenance of wheel ball bearings (2019).

To my knowledge, with the exception of these studies, the bulk of existing cycle repair research has thus far focussed on the specific context of community workshops[3] or bike kitchens. One reason for this strong focus is that community workshops are clearly delimited: it is possible to research one or several of them within the form of a traditional ethnography, where the

[2] Further detail on the two cities considered and their specific characteristics can be found in Chapter I of this thesis.
[3] Community workshops are spaces accessible to anyone in need of repair resources, often for an annual subscription fee. In these workshops, which are often volunteer-run, cyclists can ask for mechanical advice, use available tools, and purchase spare parts for a modest sum.

researcher successively meets with members of a given group (Beaud and Weber 2010). This form of exploration has been utilised by many researchers, with most of the studies cited below being comparative case studies, the majority of which focus on two community workshops. The most exhaustive exploration of a high number of community workshops was attempted by Simon Batterbury over the last 15 years, with the assistance of several collaborators[4].

Another aspect of community cycle workshops that makes them attractive as objects of research is that they present themselves as alternatives to a consumer society. This alternative is made possible through transforming the position of the cycle in society (Bradley 2016), as well as through the emergence of an "imperative of responsibility" involving actions of care towards the cycle (Batterbury and Dant 2019).

Several scholars have explored the way in which community workshops empower cyclists within the contexts of meeting their mobility needs and the development of their cycling practices (Batterbury and Vandermeersch 2016a; Abord de Chatillon and Eskenazi 2022). Some studies have explored the power dynamics that restrict the benefits, or beneficiaries, of this empowerment in relation to race and socio-economic status (Arnold 2012) or gender (Abord de Chatillon 2021). The work of the sociologist Alexandre Rigal suggests that community workshops are a place where people engage in their own transformation and in the acquisition of new habits (Rigal 2022). These self-development processes have also been shown to have strong therapeutic benefits (Marks 2021).

Community workshops are generally quite easy for researchers to access, something that constitutes an advantage for young researchers. Indeed, many of the existing works focusing on community workshops were realised within the frame of Bachelor's or Masters dissertations. Some of these works discuss the role of community workshops in the context of their role in creating a sustainable, socially cohesive, and resilient city (Del Real Hobon 2015; Ferrand 2016; Bugedo Caroca 2021). Others explore repair practices themselves, with a focus on learning repair (Mené 2019), or as a way to discuss repair practices as a whole (Dowsett 2012). For

[4] This enterprise is documented on the blog "Bike workshops research", URL https://bikeworkshopsresearch.wordpress.com/ (accessed July 2022).

example, although based on the study of two community workshops, the dissertation written by Owen Dowsett provides a discussion of broader repair practices, and develops some initial insights into how the operation of community workshop repair relates to professional cycle shops (Dowsett 2012: 30–31), as well as a reflection on the broader economic system in which the cycle is designed (Dowsett 2012: 35–37).

Gaps and Deficiencies in Current Cycle Repair Literature

This overview of the main bodies of research focusing on cycle repair highlights a few aspects of this practice that have not yet been addressed. First of all, several aspects of cycle repair have thus far received no academic attention, leading to a lack of consideration of the diversity of cycle repair practices. Indeed, no study has yet focused on professional cycle repair (such as that occurring in cycle shops), that performed by professional team mechanics, or that realised by mobile mechanics. The existing focus on community workshops also neglects a second, very widespread type of amateur repair: home repair, realised alone or with the help of friends or relatives. Another aspect of repair practices that is typically disregarded in the aforementioned studies is non-repair, along with the experiences of cyclists who ride dysfunctional cycles on a daily basis.

Overall, cycle repair is often considered to be a particular practice occurring in a given space. In reality, however, it takes extremely heterogeneous forms and occurs in very diverse circumstances: cyclists often select a repair tactic from among several available options, and may even perform part of a repair in one space (for instance, a community workshop) and the remainder of the same repair in another location (such as a cycle shop or their own home). There is currently very little information available regarding the importance of each of these repair options in the daily life of cyclists. I believe that a full understanding of cycle repair practices must simultaneously apprehend the diverse forms of repair and resources that enable and constitute the way these practices occur.

Existing studies of cycle repair also lack a discussion of the social context in which repair occurs. It is common for studies addressing cycle repair to evoke the status of the local cycling modal

shares, as well as reflections on consumer society and the lack of insight that consumers usually have into the technical workings of the everyday objects that surround them. However, there is usually no further exploration of the social meaning of objects, or of their repair or discarding in a given local setting. Moreover, no study of repair has yet occurred in an international comparative setting. However, such a contextualisation of repair practices would be beneficial to the construction of a fuller and more complete understanding of repair practices.

A final aspect of repair practices that requires further attention is the relationship between cycling and repair. Although the materials and skills involved in each of these practices are very distinct (with the exception of the cycle itself), mechanics are often keen cyclists, and cyclists are often involved with the repair of their cycle. Cycling and cycle repair are also two practices that fuel and complete each other in many ways. One of the initial arguments made in this thesis is that discussions of cycling should include some consideration of repair, but the reverse is also true: repair practices are informed and determined by the cycles and equipment being used, the type of cycling (frequency, motives, length of the typical trip…), the parking conditions, the frequency of collisions with motor vehicles, and the conceptions of riding safety, among many other parameters of cycling practices.

This thesis addresses the gaps presented above. It explores the full ecosystem of cycle repair in the two cities under consideration, including those forms of repair that have not yet been the object of academic attention (cycle shops and home repair). It reflects on the strategic choice between different options of repair made by cyclists. Furthermore, it locates this discussion within the wider socio-economic and geographical context in which cycle repair practices occur. Another essential contribution of this thesis is its discussion of the relationship between cycling and repair, which is achieved through addressing four research questions: one core research question and three ancillary ones.

Research Questions

The previous sections have highlighted three important aspects of cycle repair practices: their

centrality to the fulfilment of safe and efficient cycling practices, their environmental impact, and, in a broader perspective, their significance for a further understanding of the social role played by material objects. In this context, I examine the conditions and resources that cyclists would require in order to engage with repair practices in accordance with their values, aims, and lifestyle. This study is based on two case studies carried out in two important urban areas of OCDE countries with low cycling rates, and does not claim to represent dynamics that occur in different contexts (either in rural areas of the same countries, or in different geographic locations and national contexts).

The core research question addressed in this thesis is therefore:

Under what conditions can urban cyclists access some autonomy in their cycling and repair practices?

As a material object, the cycle is one constituent element of the practices of cycling and repair at the heart of the above research question. A discussion of repair practices therefore necessarily includes a focus on the relationship between the cycle and the cyclist. In this thesis, I develop the concept of velonomy, which explores different forms taken by the cycle–cyclist relationship in a theoretical and operational way. The core research question can thus be addressed through applying this concept.

This core research question is supported by three ancillary research questions that further advance the objectives of this thesis. These questions were found to be necessary in order to address gaps in the literature and more fully understand the foundational concepts underpinning the core research question.

1. **How can cycle repair be more fully described in terms of the actors and spaces of cycle repair, the ways in which people repair their cycles, and the ways in which repair skills are taught and acquired?**

This ancillary question emphasises a central aim of this thesis, which is to provide a descriptive account of repair practices as they currently occur in France and in Australia. This corresponds to the gap in the literature identified above, as no research work has yet investigated cycle repair in depth. This question is addressed through a focus on the commercial and non-commercial ecosystems of repair throughout the thesis. Moreover, I investigated the common practices of repair in which cyclists engage, the nature of repair skills, the learning processes underlying these skills, and the circumstances in which repair and maintenance usually occur.

2. **What is the relationship between cycling and repair, and what is the role of repair in the everyday practices of cyclists?**

In the above, I presented the lack of academic discussions of cycling and repair as two intertwining practices. I believe that these two practices should be researched simultaneously, as they co-exist and transform each other within daily cycling experiences. This research question aims to direct focus towards the nature of these transformations, as well as to the importance of cycling and repair as they are both centred around the object of the cycle.

3. **Which factors of the urban environment, and which socio-economic characteristics, are critical for repair practices and access to repair resources?**

This third ancillary question focuses on differing modalities of repair. Repair practices take certain forms due to specific arrangements of the environment in which they occur. Indeed, each local context comes with specific available material resources, as well as widespread social representations and skills. The individual characteristics and past experiences of cyclists mediate the way in which they engage with repair practices; this, in turn, is situated within the larger structural systems in place in European and Australian societies, such as gender discrimination and consumerism, which for their part inflect upon the daily experiences of cyclists operating within these wider contexts.

This thesis answers these research questions through an argument that unfolds over five chapters.

The first chapter develops the methodological approach adopted in this research. It examines the choice to perform a comparative case study, as well as the similarities and differences between the cities of Lyon and Melbourne, where this research was conducted. It elaborates on some of the stakes of each method used and of their integration. Finally, it reflects on the position of the researcher and on the effect that this research process had on different participants.

The second chapter presents an overview of cycle repair practices. It defines and characterises cycle repair and cycle breakdown as they occur in the daily lives of cyclists and transform cycling practices. It provides a general examination of the availability of repair skills and tools among cyclists living in the two cities being considered. It discusses repair as an enterprise that may be troublesome, and that requires balancing between standard processes and improvising. It finally addresses the topic of repair as a responsibility that is shared between actors of the repair ecosystem.

The third chapter focuses on the relationship between the cycle and the cyclist. It presents diverse approaches of the relationship between material objects and individuals and applies them to the cycle–cyclist relationship. The first of these approaches is the model of material possessions, which is derived from social psychology and conceptualises the relationship between a person and an object as centred around an affective aspect, a symbolic aspect, and an instrumental aspect. The limits of this model are explored with the help of practice theory and actor– network theory. One final approach to the cycle–cyclist relationship is then presented through the introduction of the concept of velonomy, which I develop from a theoretical framework constituted of elements of practice theory, sociology of consumption, and mobility studies. Velonomy evokes a condition of the cycle–cyclist relationship in which the cyclist has the greatest autonomy, or the greatest ease, in riding or repairing their cycle, according to their individual or collective goals.

In the last two chapters, I use the concept of velonomy to explore the diverse ways in which

cycle repair practices are performed in an urban setting, and how cyclists from different socio-economic backgrounds engage with them.

The fourth chapter focuses on cycling and cycle repair as they occur in the context of a consumer society. The status of the cycle as a consumer object with a market price is discussed, as it affects cyclists with diverse incomes and levels of resources who engage with this material object. Subsequently, the role of repair and maintenance practices is assessed, as these practices highlight and transform the modalities according to which the cycle is inscribed in the consumer society. I then explore the link between income and repair, and the unequal velonomies of cyclists from diverse socio-economic backgrounds. Finally, the role of cycle shops and community workshops in mediating these unequal velonomies is discussed.

The fifth and last chapter of this thesis examines gender as it constitutes another factor of unequal velonomies. It considers cycles as gendered objects that contribute to the constitution of cycling as a gendered practice. Furthermore, it argues that repair practices are socially constructed as masculine, thus inhibiting the ability of women to acquire velonomy. The concluding section of this chapter uses the notion of script in order to explore some modalities of individual and collective feminine reappropriation of the cycle through cycling and repair.

Chapter I: Cases and Methods

"If I had a hammer
I'd hammer in the morning
I'd hammer in the evening
All over this land
I'd hammer out danger
I'd hammer out a warning
I'd hammer out love between
My brothers and my sisters ah-aaah
All over this land"

Peter, Paul and Mary, "If I had a hammer", 1962

This chapter clarifies the methodological approaches adopted in this thesis. This multidisciplinary thesis addresses several research questions that encompass different aspects of cycling and cycle repair practices, and thus require an understanding of the general trends occurring in repair practices, along with a more nuanced approach to analysing the material and sensorial experiences of cyclists and mechanics. Thus, both quantitative and qualitative research methods were used and combined into a comparative case study.

The first section of this chapter introduces the international case study conducted in the cities of Lyon and Melbourne. I present the similarities and differences between these cities, as they may be related to cycling or repair practices. The second section focuses on the use of mixed methods, more specifically the cycle research survey and semi-structured interviews. It also explores the multi-sited approach adopted in the course of this fieldwork. The third and final section of this chapter focuses on the last category of research methods employed: ethnographic methods. The position of the social science researcher can always be questioned, as it affects and transforms both the lives of research participants and the practices considered. The use of participant observation and auto-ethnography, which imply further involvement of the researcher, accentuates these transformations, as I discuss further in this final section.

1. Comparing Two Cities

The first methodological choice made for this thesis was to focus on repair practices in two different cities: Lyon and Melbourne. This comparative approach, to which I was introduced in the course of my Master's degree in Urban Studies, presents a certain set of challenges while also offering a strong relevance for interdisciplinary social science research. This section discusses the benefits of this comparative approach. It also presents the similarities and differences between both cities on which this comparison is based – first in terms of history and urban morphology, and then in terms of cycling practices. Finally, I focus on community workshops as an important element of difference between Lyon and Melbourne.

1.a. The Comparative Approach

Comparison is an underlying step of any approach in social sciences, as scientific questioning and theorising arises from comparison (Remaud, Schaub, and Thireau 2012). Just as Hind Khedira identified the value of comparison during her study of travel information practices in Rabat and Lyon (Khedira 2020: 37–41), comparison is something that also emerged as important in my fieldwork, as the cyclists and mechanics with whom I engaged often referred to other countries when relating their own experiences. Comparison may facilitate the consolidation of research results through juxtaposing them with different contexts. It also forces the researcher to redefine their theoretical approach by confronting them with the diverse interpretations of their research questions that may exist in these different contexts (Fauveaud 2018). Indeed, a comparative approach encourages researchers to name elements that may have gone unnoticed in the absence of this confrontation.

As analysed by Jamie Peck (2015), the field of urban studies has made extensive use of comparative case studies over the past decades. These comparisons were initially centred on mega-cities and based on elitist, competitive assumptions (Sheppard, Leitner, and Maringanti 2013), as they tended to focus on global metropolitan models dominating urban hierarchies. However, a movement has arisen in recent decades that aims to decentre urban studies and integrate the complexities internal to every city, while also bringing to the foreground post-

colonial territories and their potential for originating powerful theory (A. Roy 2011). In this context, one interesting aspect of the comparative approach is that it facilitates the development of more complex perspectives on global processes, such as neoliberalism or patriarchy, with each city presenting different modes of resistance and transformation under these processes (Leitner, Peck, and Sheppard 2007).

Notably, comparative work runs the risk of falling into ethnocentrism or narratives of modernity (Remaud, Schaub, and Thireau 2012). One approach that aims to avoid these shortcomings is Jennifer Robinson's suggestion to approach cities as "ordinary", namely falling outside of pre-conceived categories of analysis (2006). Following Khedira (2020), this is the approach that I have adopted in the present research, with the goal of exploring the specificities of each urban context while also highlighting what is common to them. In this regard, my approach has been, like Khedira's, rather inductive, and several of these specificities or similarities have emerged in the course of this investigation.

In the course of this inductive process, my own affective and scientific relationship to both cities fluctuated. The place in which I was born and raised was two hours by train from Lyon, making it the closest big city to my home. Melbourne, on the other hand, was the remote destination to which I was sent on a Master's degree exchange program. However, when I returned to Melbourne a year later for this fieldwork, the city felt warm and familiar; it was Lyon that became a foreign city as I grew closer to the preoccupations of Melbourne cyclists and mechanics, which had become part of my daily life. Much like my scientific involvement, my affective and sensorial engagement with each city also fluctuated over the course of this thesis. Melbourne and Lyon successively became the sensorial environment in which I existed, cycled and repaired cycles, and then a remote memory that emerged as a reference when I observed some trends in the cycling and repair practices of the other city.

As my own position regarding Lyon and Melbourne evolved, these cities have also evolved (and continue to do so) throughout the course of this fieldwork. As I type these words, in August 2022, the cycling and repair ecosystems in each city are already different from those that I identified in 2018 and 2019. Several of the organisations that I explored have ceased to operate,

while others have grown, merged or partnered with each other; some cycle shops and community workshops have changed location, and some professional mechanics I interviewed have changed careers, while others have left the city or the country. Some organisations are now maintained by volunteers who are not the same as those I met during that time. Many new repair organisations have been created since I first began my fieldwork. This thesis accordingly displays a snapshot of an ever-evolving cycle repair ecosystem.

1.b. Similarities and Differences between Lyon and Melbourne

Despite being located 15,000 kilometres apart, Lyon and Melbourne share certain similarities. Although the population of Melbourne is more than twice that of Lyon, each city is the second-largest city (in terms of number of inhabitants) in an affluent country: France and Australia both rank among the top 40 countries in the world in terms of GDP. Both cities also have the status of regional capital (Lyon in the Auvergne-Rhônes-Alpes region, and Melbourne in the state of Victoria) and are located on the banks of rivers (the Rhône and Saône for Lyon, and the Yarra for Melbourne).

One important difference between Lyon and Melbourne is the colonial history of these cities. Indeed, this thesis compares a city that has been colonised with one that participated in the colonisation of others (Le Gouic 2019). Melbourne was named after Lord Melbourne, the then British Prime Minister, and most streets in the Melbourne city centre are named after the British merchants who colonised the state of Victoria in 1835, against the wishes of the British monarch at the time (J. Boyce 2013). This colonial invasion of Melbourne left Aboriginal Australian communities in conditions of extreme deprivation (Morris 2014); notably, the experience of Aboriginal Australians since colonisation, which is above all one of dispossession, differs strongly from white Australian narratives of belonging to a land of migrants (Moreton-Robinson 2003)[5]. However, all Australians experience the colonial influence on their country's economic

[5] The level of precarity experienced by Aboriginal Australians certainly affects their daily practices of mobility and repair; this is also the case for French and Australian cyclists who experience racial discrimination of any kind. However, and due to factors that are likely related to these histories of systemic oppression, I encountered few people who were not white among the mechanics and cyclists interviewed in the course of this thesis. The present thesis therefore, and unfortunately, does not further

structures, as noted by Raewyn Connell:

> Modern Australia is a small settler-colonial society, created by violence, remote from the centres of global power, with a dependent culture and a dependent economy currently dominated by primary export sectors largely owned overseas. It is very uncomfortable for white Australians to think of themselves that way. (Connell 2014: 223)

This influence resonates in the daily life of Australians in many ways. Noticeably, colonisation continues to shape the construction of scientific research in Australia (Connell et al. 2018). It has also strongly influenced modalities of work, family, and gender relations, as well as public discussions of gender issues (Connell 2014).

The areas of Lyon and Melbourne were inhabited thousands of years before the first urban settlement, which occurred respectively under the Roman and the British occupation of these cities (Chopelin and Souriac 2019; Presland 1994). The urban morphology, landscapes (lined up with European trees), and ecosystems of Melbourne are also marked by traces of colonial settlement; its grid-shaped streets and wide avenues are characteristic of a colonial city. Meanwhile, Lyon, the earliest identified settlements of which date back to 43 BC, has narrower and sometimes sinuous streets, although the Haussmanian turn of the 1850 decade has led to the construction (over newly drained wetlands) and enlarging of wide streets and boulevards in a way similar to Paris. Another morphological difference between both cities is that while the terrain of Melbourne tends to be flat overall, the area of Lyon is known for its three steep hills (Fourvière, Croix Rousse, and la Duchère; two of these hills are located very centrally in the city).

Another central aspect of the urban environment that differs between both cities is the urban density. Both Melbourne and Lyon are experiencing an increase in their population that continues to raise questions related to the politics of densification (Kroen and Goodman 2012; Hamnett and Freestone 2018; Rousseau 2017). This densification comes with the transfer of

---

explore the mechanisms of racial discrimination that exist within cycle repair practices.

cycling traffic from rural areas to urban areas (Papon and De Solère 2010). The situation is more extreme in Melbourne, which has twice the population of Lyon and occupies an area four times larger (Figure 1.1); however, although Melbourne is the most densely populated city in Australia, its population density is five times lower than that of metropolitan Lyon. Indeed, outside of Melbourne's central business district, the city's most common type of housing is individual houses with characteristic gardens (Lewis 1999); by contrast, in Lyon and Villeurbanne, most neighbourhoods count high numbers of multi-level buildings (Figure 1.2–1.13).

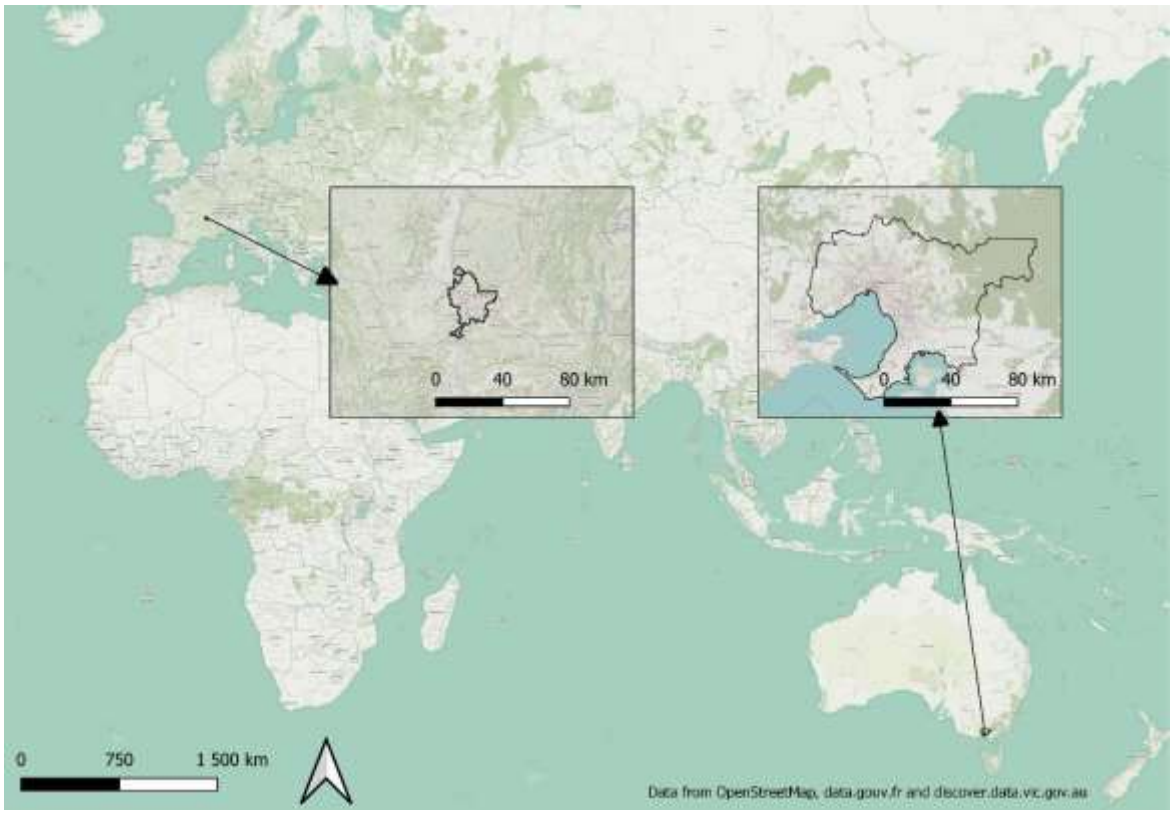


Figure 1.1 - Greater metropolitan areas of Lyon and Melbourne

This difference in density leads to marked differences between the average cycling trips taken in each city. Based on the responses to the survey conducted as part of this project, the average trip taken by a Melbourne cyclist is 44 minutes in duration, while the median trip length is 30 minutes. In Lyon, by contrast, the average cycling trip lasts 27 minutes, with a median length of

20 minutes. This significant difference remains even when splitting up trips according to their motives (commuting versus sports and leisure); for all types of trips, Melburnians ride for longer on average than Lyon cyclists do[6].

[6] In the absence of specific data regarding motives for individual trips, motives were controlled for by comparing the main trip length of commuters (who do not use their cycle for leisure) and leisure cyclists (who do not use their cycle for commuting) in both cities. In both cases, the average differs significantly according to the Wilcoxon test (p= 7.516e-07 for commuting; p=2e-04 for leisure cycling).

Figure 1.2 – Melbourne CBD; Figure 1.3 – The CBD seen in the distance from a Northern inner suburb; Figure 1.4 – A commercial street; Figure 1.5 – A residential street; Figure 1.6 – A laneway; Figure 1.7 – view from the suburb of Saint Kilda (credit: Byron Carr)

Figure 1.8 – The city centre of Lyon; Figure 1.9 – An inner neighbourhood of Lyon; Figure 1.10 – The historical district; Figure 1.11 – A residential street of Villeurbanne; Figure 1.12 – A main road in Villeurbanne (Credit Lola Sinoimeri); Figure 1.13 – A residential street of Villeurbanne (Credit Lola Sinoimeri)

1.c. Cycling Practices in Lyon and Melbourne

To understand and analyse the cycle repair practices observed in Lyon and in Melbourne, it is essential to first examine the cycling practices in both cities and the ways in which they differ.

Data related to urban cycling practices should be approached with caution, since the ways in which trips are measured are not always standardised; the results are thus rather irregular depending on the method being used (Aultmann-Hall, Dowds, and Lee 2012). One reason for this is the high seasonality of cycling practices. Moreover, cycling modal shares are very difficult to measure as they are much lower than driving modal shares, and thus follow patterns that can vary wildly across time, which complicates their interpretation (Parkin, Ryley, and Jones 2016). Besides, data collection related to transportation often focuses on the commute, which is detrimental to measuring cycling modal share (Adam 2023).

According to the available data, both France and Australia display rather low cycling modal shares (Pucher and Buehler 2008): Australian figures are in line with the low cycling rates of many other affluent English-speaking countries, while figures in France pale in comparison to some of its European neighbours, such as Denmark, Switzerland, Austria, Germany, or the Netherlands (Schepers et al. 2021). Lyon and Melbourne are actively committed to the development of cycling as a mode of transportation ("Plan vélo et mobilités actives" 2018; "Bicycle plan 2016–2020", 2015). Despite this, cycling modal share averages 2% in both cities (Caudron 2016; "Victorian Integrated Survey of Travel and Activity" 2016)[7]. Within France, this rate is far lower in comparison to Strasbourg and Grenoble, which report cycling rates of up to 12% (ADEUS 2010; Pons et al. 2019). Melbourne is more favourable to cycling than Sydney, which has a hillier terrain and fewer sustainable transport policies in place (Pucher, Garrard, and Greaves 2011), but reports lower cycling rates than other Australian cities such as Canberra or Perth (Pucher and Buehler 2008). These low figures in Lyon and Melbourne do not however fully reflect the cycling rates observed in the most central areas of each city, which can massively exceed the observed average, reaching up to 20% in some major streets (Davies

[7] Cycling rates have increased considerably in the two years since the policies implemented in response to the Covid-19 health crisis, especially in Lyon: see Klein et al. (2020) for further information. However, the data for this thesis was collected prior to this event.

2015). For instance, counts performed in major Melbourne cycleways show that cycles represent over 30% of all vehicle movement in some major streets[8]. Similarly, in Lyon, cycling modal shares are four times higher in the municipality of Lyon than in the wider metropolis (Caudron 2016).

One important difference between cycling practices in Lyon and Melbourne is the availability of cycle share services. In Lyon, Velo'v, a cycle share service launched in 2005, is very popular and widely used. Its coverage was recently extended to encompass new stations and more remote areas, while the whole fleet was replaced with lighter cycles in 2018, some of which can be equipped with an electric battery[9]. In Lyon and Villeurbanne, half of the cycling trips recorded were realised with Velo'v cycles (Caudron 2016). In Melbourne, by contrast, the public program Melbourne Bike Share registered very few trips per day (Fishman et al. 2015), until it ceased operation in 2019.

Other differences are historical and cultural: France is a country with strongly embedded cycling practices, being home to the Tour de France and the famous cycle manufacturer Peugeot. Saint-Etienne, a city located 60 kilometres from Lyon, was a central area for French cycle manufacturing from the 1880s to the 1920s (Dauncey 2012). While many actors in the French cycling industry have not benefitted from the development and popularity of mountain cycles, which originated in the United States in the 1970s, there are still a few French brands that remain both leaders in their market and strong exporters, with examples including Décathlon, Mavic, and Cycles Lapierre (Mercat 2009). Australia is also home to several cycling brands, such as Malvern or Reid, with a lesser international reach.

These differing cycling cultures can be understood more clearly when considered alongside the different car cultures in their local areas; indeed, it is impossible to discuss cycling practices without taking driving practices into account, as argued by Peter Cox:

> The global hegemony of automobility means that vélo-mobility always operates in the

[8] Cycling data" on the website of the City of Melbourne, accessed October 2022. URL: https://www.melbourne.vic.gov.au/parking-and-transport/cycling/Pages/cycling-data.aspx
[9] Read « Le nouveau Velo'v est arrivé dans la Métropole de Lyon ! » published in Met', Le Magazine de la Métropole de Lyon, July 2018. URL: https://met.grandlyon.com/le-nouveau-velov-est-arrive/

> shadow of automobility, shaped by the hegemonic dominance of car-systems. (Cox 2019: 29)

The domination of the car arose in part due to an association between the car as object and ideas of freedom and adventure (D. Miller 2001; Mom 2014). Australian culture has strongly engaged with the car, a vehicle that has been essential to the colonial appropriation of the land (Clarsen 2017). Movies such as the franchise Mad Max (G. Miller 1979; 1981; 1985; 2015; 2024) and the lesser-known horror–comedy film The Cars That Ate Paris (Weir 1974) embody the long-held Australian fascination with cars. Another exploration of Australian car culture can be found in the work of the artist Clare McCracken. McCracken drove through Australia in order to visit the country's many "big things": massive structures (in the shape of e.g. animals or objects) built on the side of highways for advertisement purposes and the entertainment of passing drivers. In service of this aim, McCracken drove around carrying a very large carrot, which she used to humorously call into question the relationship between mobile Australians and their surrounding environment (McCracken 2020).

The cycling markets of France and Australia also differ significantly. Indeed, while known cycling brands are distributed in specialist stores in both countries, online cycle purchase is more common in Australia than in France, where online purchases amounted to only 3% of all sales in 2018 (Courbe 2020). Moreover, large multisport chains such as Décathlon are exceptionally popular in France and account for the highest share of cycle sales in the country, at 64% of all sales in 2018 (Courbe 2020); this is higher than in any other European country (Mercat 2009). This domination of multisport chain stores in the French market has been pushing cycle prices down in France (Mercat 2009) while guaranteeing the availability of affordable cycles with decent and controlled quality (aftersale service is guaranteed by the existence of repair workshops in each of these stores). By contrast, in Australia, the only low-price options available, beside the second-hand market, are the poor-quality cycles sold online or in

supermarkets[10].

1.d. Community Workshops in Lyon and Melbourne

One final and notable difference between the cycling cultures of Lyon and Melbourne concerns the availability and organisation of community workshops and self-repair workshops. I define both of these terms as follows:

• Community workshops are not-for-profit spaces, equipped with tools, in which cycles are repaired before being sold or donated. These spaces are often used by a team of volunteers or employees, helped or supervised by a more qualified mechanic. These spaces can be self-repair workshops, but also include workshops in which the general public is not welcome (except when making a cycle purchase). There is often a social aim to the constitution of these workshops, centred either on the benefits of learning cycle repair or the benefits of affordable cycles being more widely available.

• Self-repair workshops – also sometimes called "bike kitchens" – are community workshops accessible to anyone who might need mechanical help with their cycle, often in return for an annual subscription fee. In these workshops, cyclists can ask for mechanical advice from volunteers or employees, or use the available tools and spare parts for a modest fee. They are often associated with DIY culture.

In Lyon, I identified and visited eight community workshops (Figure 1.14–1.19). One of them aimed to provide vulnerable people with employment and sold the repaired cycles for a regular market price. Another was a hybrid of a repair shop and a self-repair workshop, with the mechanic alternating between repairing cycles for a fee and supervising people in the repair of their own cycles for a more affordable price. The six other workshops were all self-repair workshops. Since the end of my fieldwork (in 2019), four other workshops have been created,

[10] Unfortunately, I have been unable to access exhaustive accounts of the Australian cycling industry and/or equivalent figures to those made publicly available by French institutes; the analysis of the Australian market presented herein is thus based only on qualitative observation and discussions with mechanics.

two of which are self-repair workshops.

In Melbourne, I identified ten community workshops (Figure 1.20–1.25). In three of them, volunteers repair cycles and donate them to people in need (either refugees or people who have been referred by social workers). These workshops are similar in nature to the "men's shed", an Australian form of organisation where men socialise with each other by engaging in manual labour[11]. In two other workshops, volunteers repair cycles before shipping them to countries in Africa, where they are donated to local cyclists. Another workshop trains people who are undertaking Community Correction orders or completing prison sentences in developing repair skills. The cycles they repair are then distributed to local residents or migrants, or sold to visitors from overseas for a low price. Out of the ten community workshops that I visited in Melbourne, only two were self-repair workshops.

Overall, both cities are home to a similar number of non-commercial cycle repair spaces; however, the form taken by these workshops differs substantially. In Melbourne, self-repair workshops are fewer in number, and therefore more isolated, whereas in Lyon, such workshops are the dominant model. This model is reinforced by an existing local and national network. At the national level, the network l'Heureux Cyclage[12] federates French self-repair workshops while providing them with a means of communication, online services, resources, advice on how to ask for subsidies, and an annual gathering. The Lyon network of self-repair workshops, la Clavette[13] (Coordination locale d'atelier vélo), is a structure that facilitates the exchange of resources, tool-lending, and volunteer training between the ten member workshops, and also advocates for them at the local level. The anchoring to a strong local and national network contributes to the development of self-repair workshops in France.

[11] Further details on this topic can be found on the website of the Australian Men's Shed Association. URL: https://mensshed.org/what-is-a-mens-shed/
[12] https://www.heureux-cyclage.org/
[13] https://clavette-lyon.heureux-cyclage.org/

Community workshops in Lyon: Figure 1.14– Janus;, Figure 1.15 – Change de chaîne; Figure 1.16 – l'Etablicyclette; Figure 1.17– les Bikers; Figure 1.18– la Petite Rustine ; Figure 1.19 – le Chat Perché

Community workshops in Melbourne: Figure 1.20 – Bikes4Life; Figure 1.21 – the Bicycle Hospital; Figure 1.22 – WeCycle; Figure 1.23 – Second Chance Cycles; Figure 1.24 – Back to Bikes; Figure 1.25 – the Red Cross

At the time of my fieldwork, however, Melbourne workshops had been less successful at structuring their relations with each other[14]. Similar to some workshops in Lyon, the existing workshops reported being overwhelmed by participants and not wishing to extend their activities; they would prefer other workshops to develop in order to ease this pressure on their own activity:

> *One thing that we tried to do is to help other workshops develop. There is a new workshop that just opened, and we tried to support [the operator], give him tools and stuff, he didn't say yes, we don't know why. They might be wary… but we just want them to be bigger and more successful, so that people don't come to us. We have a policy of no publicity, we don't talk to journalists. Occasionally, journalists come down and include us in some television program, and then we get 65 people coming the next morning! The results of too much advertisement are terrible. We don't need people to tell their friends about us.*

Walter, community workshop volunteer, Melbourne

The coordinator of one community workshop mentioned her frequent participation on an international online forum for similar organisations, where advice about the economic model of workshops can be exchanged. I was also present when members of two community workshops decided to meet and discuss the topic of volunteer turnover, which was an issue for one of them.

[14] A similar initiative was however launched shortly after my departure from the city.

2. Steps of the Research

Now that the foundations for a comparative case study have been laid, I would like to introduce the approach employed in the present research to apprehend cycle repair practices in their full complexity. This approach consisted in using, and combining, a diversity of methods, both quantitative and qualitative, including the distribution of a survey and the realisation of semi-structured qualitative interviews. This mixed-methods study was performed using a multi-sited approach.

2.a. Use of a Mixed-methods Approach to Better Apprehend Material Culture and the Urban Cycle Repair Ecosystem

One choice made in this PhD research was to follow a mixed-methods approach. Quantitative and qualitative approaches have been favoured to different degrees over time: quantitative approaches were dominant among social scientists after the Second World War, but the popularity of qualitative approaches rose again in the last two decades of the twentieth century (Morgan 2007). Mixed-methods research may be described as "research in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry" (Tashakkori and Cresswell 2007: 4).

Some researchers argue against this choice, as, according to them, quantitative and qualitative methods each match one type of research question, something that makes their combination a thorny enterprise (Tashakkori and Teddlie 2003). However, the mixed-methods approach became increasingly popular and was formalised as a research paradigm in itself with the creation of the Journal of Mixed Methods Research in 2007 (Tashakkori and Cresswell 2007).

In the course of this project, my choice of approach was motivated by my personal research experience, during which I experimented with diverse methods. As an economics and management graduate, I have been trained in quantitative methods and am convinced of their relevance for social science research; moreover, discovering the fields of urban studies and mobilities studies has also led me to engage with more qualitative methods. Mixed methods

thus caught my interest as a methodological translation of the interdisciplinary approach that I adopt in this thesis.

This choice corresponds to the specific characteristics of the research topic. Cycle repair and maintenance has not been researched extensively in the past. In this context, the use of a mixed-methods approach allows for the development of a general overview of the repair practices typically conducted in a particular urban setting, while also providing more thorough and deeper understandings of the underlying mechanisms at play during these practices. By facilitating a grasp of different aspects of the topic under study, a mixed-methods approach mitigates some of the shortcomings of each type of method.

Overall, in this project, four different types of data were collected. First, I designed a survey focusing on cycling and repair practices, which was completed by cyclists in both cities. In a second step, I conducted semi-structured interviews with members of key cycle repair-related organisations, as well as cyclists with diverse levels of repair experience. A third step, conducted simultaneously with all others, consisted in regular participant observation in repair workshops. The last phase was the regular repair of my own cycle, with help or on my own, while taking notes.

The efficiency of mixed-methods approaches depends on their integration within the research in question. In this study, I used survey data as a background to provide basic figures and statistics that could inform of general trends related to cycle repair; moreover, interview extracts were used to illustrate these tendencies and how they were experienced by cyclists and mechanics, as well as to present these trends in a more nuanced light and foreground the complexity of repair experiences. It also enabled highlighting some of the causal mechanisms that underlie a more precise analysis of the phenomena observed. For instance, quantitative data may highlight a link between two variables (e.g., by demonstrating that cyclists who earn higher incomes are more likely to resort to professional repair than lower-income cyclists), but this does not itself identify the nature of the causal link between these phenomena. In this context, qualitative data may provide further insights into the processes linked with income and repair choices, through focusing on testimonies of high- and low-income cyclists who discuss

their respective attitudes to repair.

Participant observation and auto-ethnographic data constituted another type of background: an embodied, sensorial background, through which my body could grasp some of the feelings and experiences that research participants later described to me in the course of interviews. It also allowed me to glean detailed information about the diverse actors and spaces of repair, something that was useful in the rest of the study.

2.b. Survey Design and Collection

The first step in data collection was the development of a survey aiming to describe the repair and cycling practices of cyclists in Lyon and Melbourne, referred to hereinafter as the cycle repair survey. Any local resident who owned at least one cycle and who sometimes used it was invited to complete the survey, relying on the assumption that people who did not own a cycle had less relevant repair experience to share. This thesis accordingly focuses on the repair experiences of cycle-owning individuals. This may represent a significant gap in the analysis, as rental cycle models are spreading, including in Lyon. However, I believe that a study of the repair practices of cycle-owning cyclists may also contribute to a better understanding of the experiences of non-cycle-owning cyclists.

The survey included some demographic questions about gender, place of residence, and income. Subsequent questions revolved around cycle ownership, the condition of the cycle (or cycles), cycling practices (along with their frequency and characteristics), and repair practices (including a series of questions about the conditions of the last repair in which the respondent had been involved).

The survey was designed in French and English, and was tested by seven native speakers of each language in order to test its coherence and grammar. Conceiving the survey in both languages at once allowed for the avoidance of certain phrasings that would be language-specific, as well as an improved equivalence between each version of the survey.

The survey was accessible online; however, the online distribution of surveys is known to generate bias that results in the under-coverage of certain sections of the population (those that

have less access to the internet, or are less comfortable with its use), as well as self-selection bias (Bethlehem 2010). In order to reduce these biases, I distributed the survey to cyclists in the street, in the form of a piece of paper with a short message and a link to the survey, as well as a QR code redirecting prospective respondents to the same link[15]. When distributing these invitations, I chose strategic locations with a high flow of cyclists and red lights where they had to stop for a certain length of time. A surprisingly small number of intersections met these criteria, since cyclists often do not stop at red lights; this behaviour is sometimes illegal, but also presents a lot of convenience for cyclists, since red lights were implemented for (and are mainly synchronised for) car traffic, and thus represent a bigger impediment to cyclists (Eskenazi 2022: 84; Héran 2011; Popan 2019: 115). In France, skipping red lights was made into policy in 2012, with the addition to the road rules of new signage that permits cyclists to pass through a red light under certain conditions[16].

This attitude regarding traffic lights also became an issue due to the diverse behaviours adopted by cyclists in this regard: indeed, although breaking this road rule is common in both France and Australia, it requires some ease and confidence that not all cyclists possess (Popan 2019: 115–116). Distributing surveys at an intersection where some cyclists, but not all, pass through red lights, would mean distributing it to cyclists that share a particular attitude regarding traffic law. For this reason, I distributed the link to the survey at intersections with high levels of cycle and car traffic, which prevented all cyclists from running the red light and thus made them available to my survey distribution. However, this approach restricted survey distribution to the most central areas (where the flow of both cars and cyclists was the highest), and to rush hour; this possibly created a new bias, where commuters living or working in central areas were more likely to receive an invitation to participate. Another potential bias in the sample may have been that few cyclists who ride less frequently were represented, since I distributed these papers to

[15] QR (or "quick response") codes are 2D barcodes that contain any kind of information that can redirect scanners to online information. These codes are accessed using a smartphone device.
[16] In 2022, 42% of the traffic lights in Lyon were equipped with such signage, and the city has indicated that it aims to increase this proportion to 100% within the next five years; read "Panneaux M12, les cédez-le-passage pour cyclistes" on the website Lyon.fr. URL: https://www.lyon.fr/deplacements/les-modes-doux/panneaux-m12-les-cedez-le-passage-pour-cyclistes

people during the course of their cycling journey.

The one to three minutes during which cyclists were available when waiting for a red light were enough for me to hand out papers to stationary cyclists, while introducing myself and my research aim in a few sentences (Figure 1.26).

Figure 1.26 – Distributing the survey at a red light during peak hour, Melbourne

In Melbourne, where helmet use is mandatory for cyclists, I kept my helmet on in order to signal that I was myself a cyclist. My harmless appearance as a young white woman likely contributed to the good reception of this enterprise (Ferber 2007). As a result – and because I was not taking up any of their free time or getting in their way – most cyclists were happy to listen to me and to take the piece of paper. I only had to repeat my speech a couple of times before handing the paper to a dozen cyclists, since they were very close to each other. Sometimes a cyclist would

reach for the paper as they were departing, indicating with a nod that they had heard my explanation even if there was no time for a further exchange. In other cases, cyclists asked me for more information about my research, or even discussed cycling with me for a longer period, moving on to the footpath as the light turned green. In rarer cases, I stapled papers to the handlebars of parked cycles, or approached cyclists as they were locking or unlocking their cycles.

After a while, and after noting that the rate of response to these papers was about one in every six or seven, I decided to broaden the base of respondents by also sharing this survey on some cycling Facebook groups, which increased the number of respondents. I estimate that about a fourth or a fifth of all responses to the survey came from sharing it online in this way. Overall, 451 people in Melbourne and 466 in Lyon completed the survey; these respondents resided in diverse locations throughout the metropolitan area, as displayed in Figure 1.27.

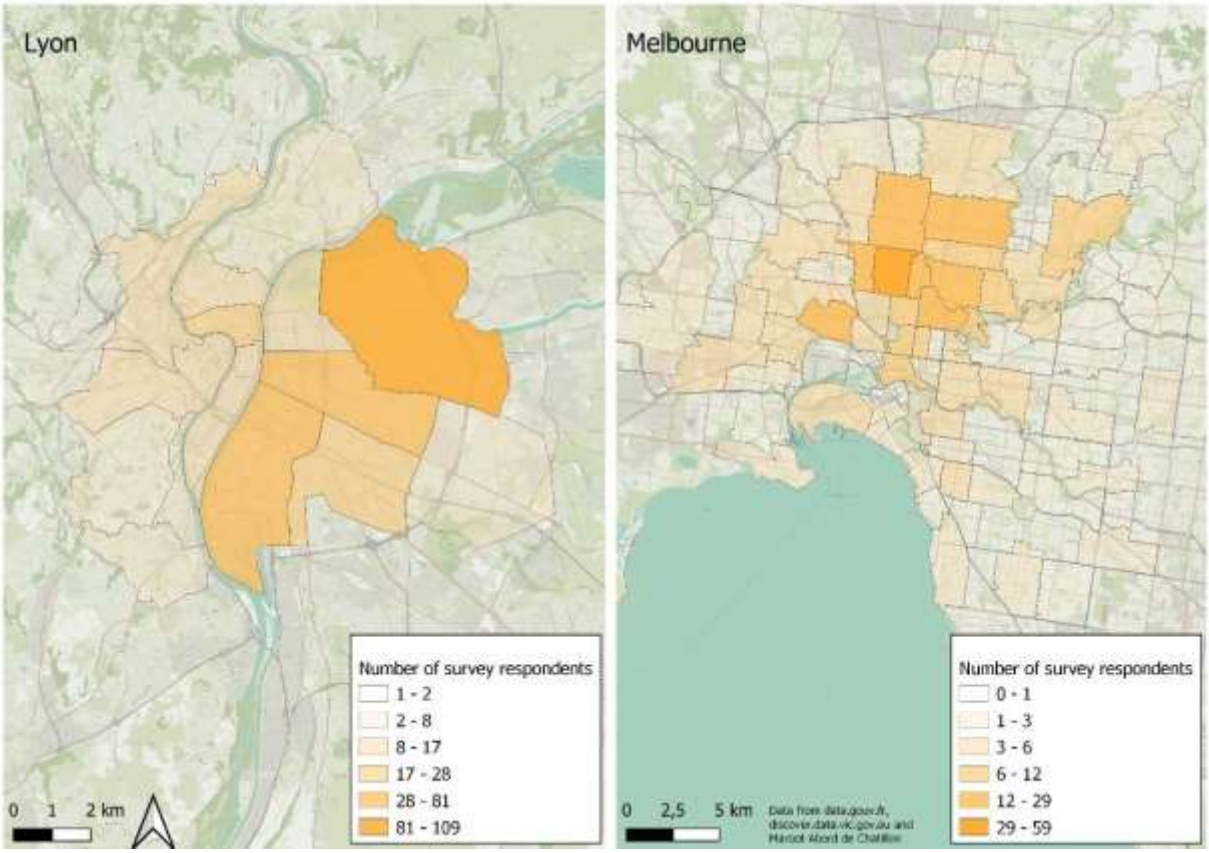


Figure 1.27 – Number of survey respondents per postcode area in Lyon and Melbourne

2.c. Interview Design and Collection

The second type of data collected was semi-structured interviews. Semi-structured interviews follow a pre-established structure with key themes to some extent, but also leave space for respondents to spontaneously discuss the things that they deem important. I conducted a total of one hundred interviews with diverse actors involved in cycle repair, including cyclists, professional mechanics, and community workshop volunteers. I also met with two members of local government (one at the operational level, and one at the political level) in each city. Interviews lasted for one hour on average and were conducted in various locations, often those suggested by the respondent in order to help them feel as comfortable as possible.

In this thesis, quotes from these interviews are anonymised to some extent: each quote is presented alongside a first name, information on the status of the interviewee in the overall fieldwork (cyclist, community workshop volunteer, mechanic, or mechanic and owner), and the city in which the interview was conducted (Lyon or Melbourne). These quotes thus differ from extracts from survey answers, which are introduced without any further context. In the quotes that can be found in this thesis, any mentions of identifiable people or organisations have been anonymised; for instance, references to specific community workshops or cycle shops have been replaced by the terms “the workshop” or “the shop”.

The interview structure differed according to the profile of respondents: indeed, cyclists, community workshop volunteers, and mechanics have different approaches to cycle repair, and the questions aimed to reflect this.

I interviewed a total of 35 cyclists, who were contacted through diverse means. Some were survey respondents who had agreed to being contacted for further discussion. I specifically reached out to those who had indicated a high or a low experience in repair, with an attention to gender balance (specifically, women indicating high repair skills and men indicating low repair skills, being rarer, were more specifically targeted). Notably, the focus on cyclists with low repair skills led to some difficulties, as people were often less interested in discussing matters with which they had little experience or that they were less interested in and

comfortable with. Moreover, they often lacked vocabulary related to repair that would enable the conversation to proceed to a deeper level; this sometimes led to extremely short interviews. In Melbourne, I had the opportunity to meet nine cyclists with limited repair experience through the help of an organisation called "Bike@Work", which offered basic and advanced cycle repair lessons in the City of Darebin (a locality of Greater Melbourne). This organisation allowed me to attend several of these lessons and gave my contact information to participants of former sessions. This allowed me to meet with cyclists who had some interest in repair without being very experienced at it.

Interviews with cyclists briefly addressed their individual cycling experience, before asking them in more depth about the history of their cycle ownership and their successive past experiences of repairs (or lack thereof) with each cycle they owned. The topics of our discussion included their repair skills, their choice to conduct repair themselves or attend a cycle shop or a community workshop, and their experiences with diverse repair spaces if they happened to visit them. I brought specific attention to situations of non-repair (for instance, when cyclists opted to buy a new cycle as a replacement for an older one). I usually asked them to show me their cycle(s) and describe them to me, although the circumstances of the interview did not always make this possible. One frequent limitation of these interviews was that cyclists often struggled to recall details of repairs that they had performed or arranged in previous years, as repair is often quite an uneventful activity. However, they would sometimes also begin to recall past experiences in increasing detail over the course of our conversation; as a consequence, some discontinuity emerged in the timelines, but I did not find this to be much of an issue for this study.

I also interviewed 23 community workshop volunteers. As with the cyclist respondents, these interviews tended to focus on the repair experience and the history of learning repair of these volunteers. They also included questions about the community workshop itself and its specificities, as well as about repair practices as they occurred in the context of this workshop. Community workshop volunteers were either people whom I already knew from my own involvement in repair, those who had agreed to meet with me upon the recommendation of a common acquaintance, or people whom I met while visiting a workshop during a repair session

(in which case it was difficult to converse for a longer period of time, as they were very busy). Discussions with community workshop participants were thus the most heterogeneous of all the interviews that I conducted during this study.

The last group of interviewees was professional cycle mechanics. I interviewed 38 of these, including three who were mobile mechanics intervening on location after a phone call, and 19 who were owners of the cycle shop in which they worked. I did not meet any cycle shop owner who was not, or had not been in the past, a professional mechanic. These interviews included a discussion of the respondent's acquisition of repair skills over time, their working conditions as mechanics, the specificities of each cycle shop, and their relationships with cycle shop customers. Mechanics tended to be both enthusiastic about participating in this study and very busy, which led to issues when it came to interview scheduling. I sometimes had to return to a shop several times before the mechanic could find a moment to answer my questions; sometimes, the mechanic chose to answer my questions while working, which led to being frequently interrupted by customers or a ringing phone, and accordingly to difficulties regarding the fluidity of interviews. However, these experiences also gave me a glimpse of the working conditions of mechanics and the commercial interactions involved in this occupation.

2.d. Multi-sited Ethnography: Constructing the City of Repair[17]

Conducting interviews with actors in diverse repair spaces in Lyon and Melbourne presented methodological issues that would not have manifested during an ethnographic study of a single community workshop or cycle shop. One central aspect of this methodological approach is that it covered multiple sites, since I engaged with several spaces of repair in each city. This required identifying spaces that, taken together, would be representative of the diversity of repair practices existing in each urban area.

The term "multi-sited methodologies" was first coined by George E. Marcus (1995) to describe fieldwork conducted in several locations, often in different countries across the world. In

[17] I presented part of this subsection at the annual symposium of the association Anthropovilles in Lille in November 2019.

ethnographies conducted across multiple locations, Marcus perceived a rupture with traditional ethnography and its monographies, conducted for several years at a time in a small village or another location in which all individuals considered know each other.

According to Marcus, multi-sited ethnographies arose following a transformation of the modes of production of research, including both the evolution of researchers' lifestyles and the development of interdisciplinary approaches, to which he argues multi-located ethnographies are particularly well-suited. Marcus draws a parallel between the development of multi-sited ethnographies and a rising interest in macroeconomic and macro-social mechanisms, such as globalisation. He further highlights the resistances encountered by multi-located ethnographers, who were sometimes accused of diluting the strength of their research by spreading it across different locations.

One aspect of multi-sited ethnographies is that they allow, and also require, many choices and decisions. Case study selection is a process that is only conducted once in the case of monographies, but is continuous in the course of multi-sited ethnographic work. The researcher constructs their field through successive decisions. In this case, I adopted the approach referred to by Marcus as "follow the thing", since I was interested in the diverse becomings of the cycle as an object, as well as that of "follow the people", since I wanted to explore the cyclist's experience in the course of cycling and repair. I thus wanted to engage with spaces and practices related to every phase of the life of a cycle, as well as every option that cyclists could consider when faced with a broken cycle.

The construction of the field of investigation also occurred based on suggestions made by the actors under consideration. Cyclists and mechanics are often involved with a variety of repair-related or cycle-related organisations. Moreover, these organisations are often in contact with each other: cycle shops and workshops sometimes exchange cycle parts, lend each other tools, give each other technical advice, send customers to each other, or outsource specific tasks to each other. This led to the constitution of a network of actors and organisations in both cities, which I explored through successive interviews and observation sessions.

In some cases, I had to decline suggestions made to me by keen research participants. On the

one hand, this was made necessary by sample saturation, as I had met an increasing number of people with similar issues and experiences. On the other hand, I realised that seeking out certain mechanics on the advice of experienced cyclists led me to a certain type of cycle shop: these shops were either very specialised in certain types of cycling, or were known for their dedication to the work of repair. This in turn led me away from other types of shops, such as chain stores, or shops with a greater focus on cycle sales. While I attempted to correct this flaw, it is also true that small independent and repair-oriented cycle shops may be overrepresented in this study as compared to average repair experiences in Lyon and Melbourne.

While all or most community workshops in each city were contacted, the cycle shops that I visited represent only a proportion of all existing bike shops in each urban area. Most of the shops investigated were in central urban areas; this also reflects the fact that such shops tend to be concentrated in central locations, as in the case of Paris (6T 2018). Although this topic is not explored further in this thesis, such an uneven distribution of repair spaces indicates that the experiences of rural cyclists will differ strongly from those of the urban cyclists who participated in this study.

Figure 1.28 and Figure 1.29 present the locations of the various organisations that I explored in the course of my fieldwork. However, these maps do not fully reflect the diversity of my engagement with each of these repair spaces, a diversity made necessary by the multi-sited approach:

> But not all sites are treated by a uniform set of practices of the same intensity. Multi-sited ethnographies inevitably are the product of knowledge bases of varying intensities and qualities. (Marcus 1995: 100).

Indeed, not all sites researched were equivalently accessible, and some were investigated more thoroughly than others. Many sites I considered were researched through a short visit and an interview with a key member of the organisation. I also had the opportunity to spend longer in some other spaces, including three spaces to which I returned regularly in order to conduct participant observation.

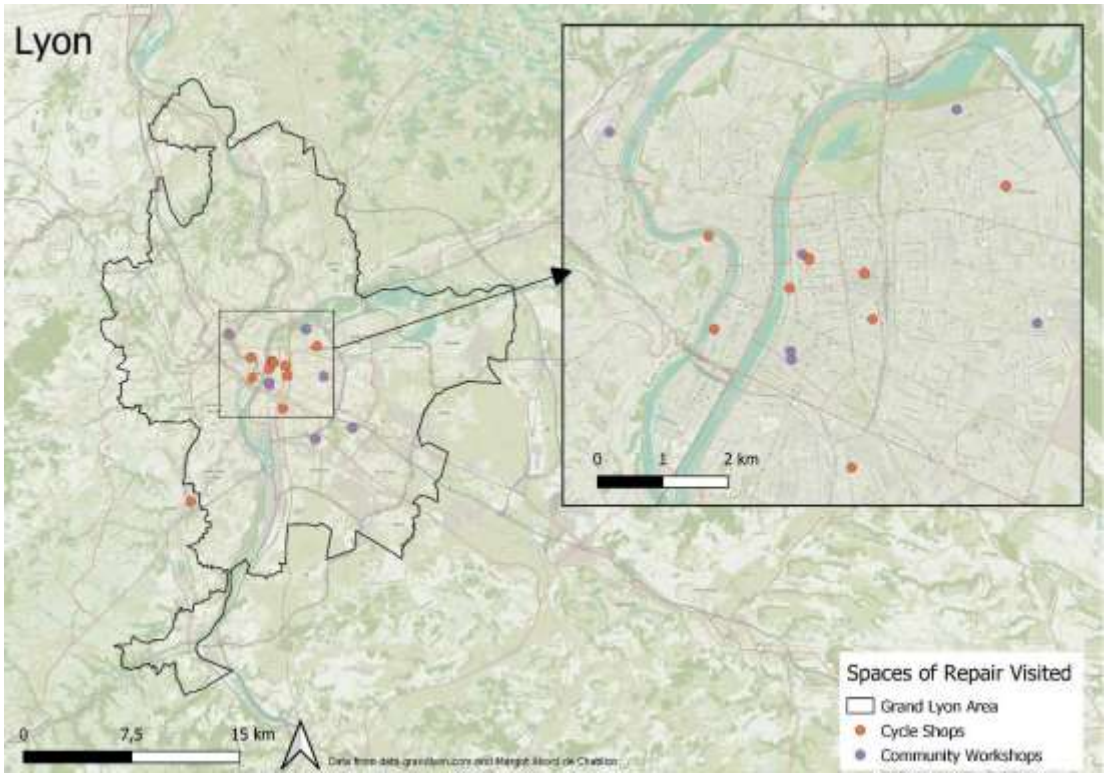


Figure 1.28 – Ecosystem of actors of cycle repair and maintenance explored in Lyon

Figure 1.29 – Ecosystem of actors of cycle repair and maintenance explored in Melbourne

According to Marcus, multi-located ethnographies put the involvement of the researcher in perspective. The researcher's position is politicised, as they must constantly renegotiate their identity and their position in relation to the system being considered. Going from one site to another also transforms the way in which the researcher is perceived.

My choice to anchor myself to several primary sites orientated the remainder of my fieldwork, since, after some time, the members of these organisations began to advise me on other places I could visit and people I could meet, while my participation in these organisations also gave me some legitimacy in others. Notably, the reverse was also true: when a conflict occurred between members of different organisations, I found out that my position as a volunteer in a given community workshop affected my subsequent interactions with the other organisations involved in the conflict.

The last research methods adopted in this study, participant observation and auto-ethnography, question the wider role of the researcher both in the research and in a wider social context, which I will explore further in the next section of this chapter.

3. Participating in Research and Transformations

The presentation of the research methods used in this study should encompass a discussion of the transformative effect of the use of these methods. Indeed, social science research is not only a scientific experiment, but also an encounter between a researcher, research participants, and the various phenomena under observation. This process is a social engagement that transforms all parts involved in it. This specifically manifests in the case of methods in which the researcher is personally present in the daily practices of other research participants: participant observation and auto-ethnographical research. This section accordingly reflects on the material, social, and ethical consequences of these transformations.

3.a. Participant Observation and Auto-ethnographical Research

Participant observation and auto-ethnographical research are ethnographic research methods that imply a form of researcher participation in the phenomena under investigation.

Observation is a method that is less formalised than interviews and surveys, and about which less material has been written and published (Bouillon and Monnet 2016), although it is also a central method for certain disciplines, such as anthropology. It can bring a very useful complementarity to other sources of data (Chanteloup et al. 2016).

Participant observation can be defined as follows:

> [Participant observation] involves researchers moving between participating in a community – by deliberately immersing themselves into its everyday rhythms and routines, developing relationships with people who can show and tell them what is 'going on' there, and writing accounts of how these relationships developed and what was learned from them – and observing a community: by sitting back and watching activities which unfold in front of their eyes, recording their impressions of these activities in field notes, tallies, drawings, photographs and other forms of material evidence (I. Cook 2005).

Participant observation is thus constituted by alternating between positions of insider, outsider, and "in-betweener" within a research field (Milligan 2016).

In the case of this research, I was involved on a deeper basis with three community workshops, where I became a regular volunteer and attended meetings and secondary events.

- The first of these workshops is located on the premises of a primary school in an inner suburb of Melbourne. In this workshop, parents of students at the school repair and donate cycles to children, while also teaching them some basic repair skills. It runs two one-hour sessions per week (one at the beginning of the day, and one at the end), during which two or three parent– volunteers encourage children to contribute to the repair of cycles that are then donated to them. I participated as a volunteer, repairing the cycles and helping children to do so themselves.
- In the second workshop, also located in Melbourne, volunteers repair donated cycles that are in turn donated to people in need. Passers-by are welcome to purchase some of these cycles and thereby contribute to the workshop's running costs. The weekly repair session lasts for five hours, with about four to ten volunteers usually in attendance. The most experienced volunteer sometimes gives a repair skills course to other volunteers who wish to attend. I participated as a regular volunteer, helping to repair cycles. I also participated in several outdoor interventions and was a member of the volunteers' Facebook group.
- The third site is a self-repair workshop located in Lyon. It is open five days a week and holds special sessions for children (once per month) and for women and gender minorities (twice per month). It also has a volunteer-only opening time, during which volunteers can contribute to the general cleaning, sorting, and functioning of the workshop in different ways than during the usual opening times. I volunteered in this workshop and joined its executive committee for a year, during which I attended monthly meetings, along with several seminars, and contributed to some decision-making, as well as to the organisation of a few events. As part of this workshop, I also engaged in diverse ways with the national network of self-repair workshops, l'Heureux Cyclage.

Observing volunteers and the ways in which they worked on cycles was made much easier when I was involved in the repair process myself. My active participation in the workshops' operation contributed to me getting to know the volunteers on a less artificial basis than if I had been an external observer, meeting them only once for an interview. It allowed me to become acquainted with some issues and specificities of each workshop that only became apparent after a long time: for instance, the strategic positioning of each workshop regarding their prices or accepting new members, their perspectives regarding future growth, their relationship with institutional authorities or with other workshops… This, in turn, allowed me to gain a better understanding of how repair occurs in a not-for-profit organisational setting.

In addition to this participant observation, I also engaged in auto-ethnographic research. According to Ellis and Bochner (2000) auto-ethnography consists in "autobiographies that self-consciously explore the interplay of the introspective, personally engaged self with cultural descriptions mediated through language, history, and ethnographic explanation" (742). Auto-ethnography is used in many fields of research, and this term may cover several different realities (Chang 2016). For some scholars, auto-ethnography is the study of one's own cultural group (Wolcott 2004). However, this is not the conception that I attribute to the term in this thesis, as many of my repair experiences occurred in very diverse settings: at home, in a cycle shop, with friends, or in a community workshop.

Auto-ethnographic studies are often centred on the researcher's own experiences, linking them with their personal history or cultural background (Chang 2016). Several works related to cycling have adopted this approach (Spinney 2009; 2006; Edensor 2011; Popan 2019; Ortar 2019). However, this thesis does not adopt such a focus. Instead, the role of auto-ethnographic data is secondary in the present research, as it aims to complement and complete other methods employed; while my own involvement with repair was an essential part of how I as a researcher conducted this investigation, it is not the main data that I analyse herein.

Participating in repair on diverse occasions (Figure 1.30–1.31) allowed me to acquire skills and a vocabulary that would later become useful in the course of my interviews, as well as further

observations, since these often required me to discuss rather technical operations, sometimes in a language that is not my native language. Participating in repair helped me gain a better understanding of what was happening in real time than would have been possible if the action was merely described to me. Displaying some knowledge of cycle tools and parts also aided me in asserting my legitimacy as a researcher while interacting with mechanics and shop owners; this, in turn, encouraged them to describe certain mechanical operations that they had experienced without having to explain each term and what it referred to.

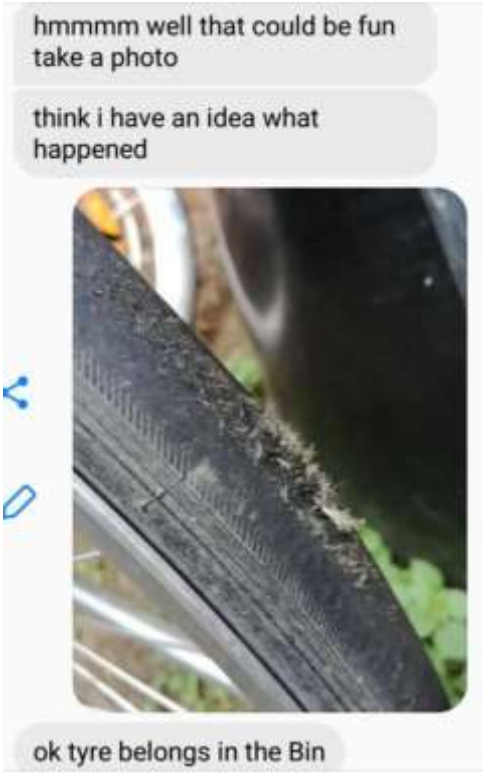


Figure 1.30- Auto-ethnographic research: Conversation with a community workshop volunteer

Figure 1.31 – Participant observation – The researcher in the process of regreasing wheel bearings in a community workshop

This skill acquisition did however take some time: at the beginning of this study, I started at a very low level of knowledge (I could barely tighten a nut confidently), and I have not yet achieved total mastery of the related mechanical skills. I can observe a strong difference

between some earlier fieldwork notes and interview transcripts and the cycle-related interactions I have today. My lack of understanding of some principles of cycle mechanics and uncommon cycle parts was sometimes kindly pointed out by some of my interviewees:

> *P - So I bought it, but I didn't use it immediately because there were some… what do we call it… tubular, you know, tubular tyres.*
>
> *M – I don't know what that is.*
>
> *P – You don't know? Aren't you the one doing a PhD about bikes?*[18]
>
> Patricia, cyclist, Lyon

I also repaired cycles outside of community workshops: at home with friends and relatives, or when something broke down while I was far from any repair space that I knew of. I kept a diary of these experiences so that I could subsequently reflect on them. This allowed me to maintain a focus on repair not as a social phenomenon or statistical occurrence, but rather as it is experienced in the flesh, while repairing or while riding. This personal engagement with repair fuelled my research process, as it allowed for spontaneous visits to diverse repair spaces. It also brought me to deeper understandings regarding the complexity of repair, including those pertaining to its less-discussed aspects: for instance, processes of trial and error are rarely recounted in detail by cyclists who describe their repair experience. Unsuccessful repair is also usually forgotten as soon as the cycle is working again, with the unpleasant experience of working on a mechanical issue for several hours disappearing from our minds shortly after it has been resolved.

Another factor that increased my interest in using participatory methods was that my personal involvement with repair, learning repair, and the associated hardships and joys meant that I could empathise with mechanics and cyclists when they described their own experiences,

[18] « - Et voilà, je l'ai acheté mais je l'ai pas utilisé tout de suite parce qu'il y avait des… comment on appelle ça des… des boyaux, tu sais, des pneus boyaux. / - Je ne connais pas. / - Tu ne connais pas ? C'est toi qui fais une thèse sur le vélo ? »

which in turn smoothed the interview processes. For example, some interviewees felt embarrassed about some of the struggles that they had encountered in the course of repairs; being able to hint at my own difficulties made them more confident in discussing their experiences.

3.b. Engaging with the Cycling Community

This study was made possible in part by the very high willingness of cyclists to participate in my research. In total, over nine hundred people agreed to spend (at least) ten to fifteen minutes of their life answering the cycle repair survey, sometimes sharing it with their friends and colleagues. About a third of all survey respondents left their contact details and agreed to further participation, with over a hundred people agreeing to be interviewed for an hour, sometimes two. Out of a hundred people, only one person met my request for an interview with a refusal. Community workshop volunteers accepted my presence, introduced me to their spaces of repair, taught me repair skills, and accepted my presence, despite the potential harmful consequences of being observed and written about. Countless others recommended some relevant contacts to me, gave me some advice, or pointed out interesting locations.

I am grateful for this community engagement with my work, and it is important to me as part of my research ethics that my work acknowledges and honours these many contributions. I believe that this involvement with cyclists was facilitated by some specific characteristics of the cycling community[19]. Here, I use the term "community" to refer to the cyclists who believe that they share some interests with each other, that cycling is a desired activity that should be encouraged, and for whom cycling is a part of their identity.

Some scholars have argued that cyclists constitute a community, which is made possible by their embodied shared experience, especially in the case of hostile encounters with cars (Freudendal-Pedersen 2015), or even of an identity involving a certain form of citizenship (Aldred 2010). This cycling identity is related to the dominance of the car, a ubiquitous part of

[19] I discuss some elements of this in a post of the research blog Cambouis, titled "Enquêter avec les cyclistes". URL: https://cyclops.hypotheses.org/1331

the cycling experience. However, many cyclists do not actively participate in the cycling community or consider cycling to be a part of their social identity, and assuming that they do would be misleading. Furthermore, people who engage with cycles can have extremely different practices and motivations according to the type of cycling that they favour (Cox 2005). This is why I only use the term "community" to refer to cyclists who actively link their cycling practices to their identity and values, rather than all cycle users.

In the present discussion, I use this idea of community specifically to highlight the commitment of many cyclists in this study, a commitment that was made possible by this conviction of shared interests and that has benefitted this thesis overall. My previous work, which focused on the use of small public spaces, did not benefit from this type of engagement, as people who passed through public spaces typically did not have such an attitude to the topic that was being researched and did not consider (for example) "sitting on a bench" as a major part of their identity or values, which made data collection more difficult. By contrast, this study has benefitted significantly from the contributions of cyclists for whom cycling practices are meaningful and important. As a cycling researcher present in repair spaces, I was often identified as belonging to this same community, comprising people who not only cycled but also aimed to contribute to the development of cycling. As many cyclists contribute to the cycling community by engaging enthusiastically in online discussions on social networks (Abord de Chatillon and Eskenazi 2022), others felt that participating in this study would encourage further cycling. Another reason for the strong involvement of cyclists with this study was their higher level of education, which contributes to them being at ease regarding social science research (Adam 2021; Nobis 2019).

While acknowledging that not all cycle users belong to the same community, I have nevertheless chosen to refer to all of them collectively as "cyclists". Similar to the idea of a cycling community, the term "cyclist" has also been debated, as it presents a highly diverse collection of individuals and practices as a uniform group (Colville-Andersen 2009). Moreover, it also separates cyclists, drivers, and pedestrians into different categories, thus preventing a

relevant analysis of potential mode change, given that most people occupy each of these positions at different moments of their lives.

Despite this, I have made the choice to refer to cycle users as "cyclists". Indeed, this thesis does not focus on modal shift transition, but rather on the experiences of people who already own a cycle, and who (in the majority of cases) have been using it long enough for it to require some repair. Overall, despite the strong diversity of cyclists' experiences, I believe that there is some relevance in the term "cyclist", as used to refer to people who sometimes engage materially with cycles and thus share some embodied experiences and specific issues. Similarly, I chose to apply the term "repairer" to anyone who sometimes finds themselves engaged with cycle repair. This choice of words does not imply any pre-given set of shared attributes, values, or characteristics as common to either cyclists or repairers. One final choice regarding vocabulary is the choice to use the term "cycle" rather than the more widely used "bicycle"[20]. This choice is made as an attempt to leave room for the representation of diverse forms of cycles beyond the two-wheeled upright bicycle (Cox 2014), and thus to represent cyclists with diverse needs for whom the standard bicycle is not an adapted vehicle (Inckle 2019).

Reciprocally, benefitting from this support from the cycling community also transformed the process of this research. This concerns the form of our interactions: this thesis aims to express some of the rich and detailed experiences I had during this fieldwork, which did not always fit with what I would have expected. In the course of this research, I met people who were humorous and lively, and who told stories that sometimes went far beyond the frame of a discussion of cycle repair in a given city. Through the use of numerous quotes, I aim to create thick ethnography that will display the wealth and complexity of these fieldwork interactions, as described by the geographer David Bissell:

> Therefore, rather than shoehorning the split-endedness of fieldwork encounters into overly neat and packaged accounts, the presentations in this book attempt to retain some sense of the richness and drama of the encounters while being honest about what

[20] All study participants in Melbourne used the word "bicycle", which is why I chose to also translate the French word "vélo" as "bicycle" in interviews, in order to reflect the most common vocabulary in use.

> each encounter provoked for me. The edges are still bleeding: teetering on the brink of saying something different, meaning something different, feeling something different. (Bissell 2018: xxxv-xxxvi)

In this thesis, I do not go so far as to tell complex stories that extend far beyond the interview data, a method increasingly adopted by feminist geographers in an attempt to reframe dominant discourses and highlight what may appear otherwise as minor struggles (Nagar 2013). However, I did aim to share the stories of research participants in their rawest form, which led to the decision to make the original French text of interview extracts available (in footnotes after each quote), despite translating them to English for clarity.

Another aim of this thesis is to truly reflect the lived experiences and concerns of study participants. In so doing, I followed the ethnographic tradition and made some of the preoccupation shared by respondents into preoccupations of my own. This is specifically the case with professional mechanics, who shared with me some of their worries regarding the planned obsolescence of cycles, as well as cyclists' lack of involvement with their cycles. This was also the case when meeting cyclists who felt that they lacked the tools and skills necessary to engage with repair, or that they were not legitimate as cyclists if they could not perform certain repairs. In an inductive manner, the objectives of this study have evolved throughout the course of the research, fuelled by these interactions. My research aim evolved towards providing a reflection on the complex and diverse socio-material conditions of autonomy within cycling and repair practices. I intended for cyclists and mechanics to recognise some of their own preoccupations in this thesis, and to find some tools to discuss and reframe – and maybe even address – some of the specific issues they encounter.

Of course, this research also raises ethical concerns, and I aimed to take the interests of its participants into account by working to avoid clichés or construing the positions of individuals in ways that are reductive and detrimental to them. This approach, common in the fields of anthropology, also concerns other areas of research such as sociology of consumption, which

also makes use of participative research methods. This is for instance articulated by David M. Evans in the following way:

> [Daniel Miller's] recommendation for consumption scholarship to 'empathetically consider the perspective of the people one is working with' (2001, p. 231) could usefully be taken as the starting point for any research that wishes to address the environmental consequences of consumerism (Miller, 2012). (Evans 2019: 511)

In the case of cycle repair, this concern regarding research ethics may seem secondary; indeed, in discussing repair, I did not focus on topics that are commonly understood to be sensitive, such as religion, family and friendship, money, sexual orientation, etc. Despite this, the people I met in the course of this fieldwork often expressed shame or embarrassment: they wished that their cycle was in better condition, that they knew more about it, that they were more skilled at repair, that they had attempted to repair it themselves rather than bringing it to a shop… Recounting tales of repair sometimes brought up the vulnerability and powerlessness that they had experienced during the repair process. I have also been told, after presenting my research, that attendants were now embarrassed about their cycle repair skills, or about not having attempted to repair something. This is not a desired outcome of this study, which aims above all to present the complexity of cycle repair practices and to reflect on the conditions that might support cyclists in reaching their desired level of autonomy.

3.c. The Role of the Researcher

A consideration of the ethical implications of research work should include a discussion of the way it has affected its participants, both within and outside of the research context. Although, like any social science researcher, I was aware that the process of research I initiated would not be neutral or separated from the practices observed, I also did not anticipate the ways in which my participation would transform some forms of cycle repair in Lyon and Melbourne. This necessary involvement between the researcher and their research objects is described in these terms by Luis Vivanco, an anthropologist who wrote about cycling:

> What defines ethnographic fieldwork is thus not in the act of separation from our everyday lives to immerse ourselves continuously in intensive social life elsewhere, but the deliberate work of creating contacts and interactions that yield meaningful insights into human lives without assuming that the ethnographer stands apart from these processes. (Vivanco 2013)

The first consequence of my study on the rest of the world was very material: in the course of the many hours that I spent in community workshops, some cycles were repaired, and I also contributed to writing an application requesting a grant for a community workshop, which would ultimately fund part of the workshop's activity. Through attending some meetings, I contributed to making decisions that affected the future operations of these workshops. In Melbourne, I was also sometimes consulted by community workshop members or cycle shop owners who had some curiosity about "how things were done in Europe" regarding one topic or another. In the course of my interviews, it also sometimes transpired that I would inform cyclists of the existence of certain repair spaces, such as a community workshop or a cycle shop close to their place of residence. I also introduced one respondent to an organisation that wanted to hire professional mechanics on a short-term basis. Although I do not think that my influence has durably changed the form taken by cycle repair in Lyon or in Melbourne, it is also true that I, as a researcher who was informed of the different shapes taken by cycle repair practices, was also myself an actor in the ecosystem I was studying.

In addition, I also noticed some indication that people involved in my research had been affected by the research process itself. Several times, for example, a person with whom I met for an interview mentioned having repaired their cycle in anticipation of this discussion: knowing that they would be discussing the condition of their cycle, they felt that they would be more valid research subjects if they had recently maintained it. Quite often, discussing repair led my interlocutors to thinking about what elements of their cycle they had been wanting to repair, which sometimes led them to perform these repairs shortly afterwards.

In other cases, I helped interviewees articulate things that were important to them but that they

had not previously understood. This was for instance the case for Olivia, a keen cyclist who was very experienced with repair, but who only realised the importance that cycling had in her life in the course of this interview:

> *That wasn't my first bike, but that was the first bike that I cared about, and that I loved. Like, I always had my bikes to get to school, but that was, you know, just regular mountain bikes that could travel well. But that was the first bike that I really loved and cared about. And my friend, her dad also loved bikes, so she had a couple of them, and we would go to the beach and ride our bikes along the beach. And… oh my god, I didn't – now that we're talking about it, all in one conversation, I realise that bikes are a big thing in my life. This morning I was chatting with a friend, and I said, "yeah, she's interviewing me about the bike thing, I don't know why me, but I guess…" [laughs]*
>
> Olivia, cyclist, Melbourne

A young female mechanic told me that she felt more confident about her repair skills after discussing her experiences with me at length. Another woman, after telling me about a difficult repair that had made her very proud, stated that remembering this event had made her want to do it again, although she had initially thought that she would bring her cycle to a shop. Finally, a man I interviewed in Lyon told me that responding to the cycle repair survey had made him consider changing careers and becoming a cycle mechanic, which led him to register for training in service of this aim.

3.d. The Cycle as a Material Involvement in Research

One way in which my subjectivities as a researcher were exposed through my exploration of the field was through my interaction with material objects. This is an experience shared by Vivanco, who describes his cycle as both an object that makes his research easier and as a research tool itself:

> Maybe it goes without saying, but I have done much of this local fieldwork using a

> bicycle. Some of the time, this use is nothing more than getting myself to and from the settings in which I am conducting fieldwork or doing an interview. But having a bicycle also means taking a bicycle into a shop for parts or repairs, interacting with others (albeit often briefly) on the roads, even simply riding a bicycle through city streets, each of which can become a setting for research as my own intimate and embodied experience becomes the basis for generating insights into bicycle mobility and making sense of what others are saying about it. (Vivanco 2013)

Like Vivanco, my cycle was essential to the process of this research, being the prime material for my repair experiments. Moreover, it was associated with me, acting as a sort of business card that sent a message regarding my position in the system. Just as my helmet identified me as a cyclist and predisposed the people I interviewed to view me more favourably, the shape and model of my cycle also engaged me and transformed my experience of the field. Its old age and sometimes unreliable condition were valued in spaces and contexts that valued DIY ethics, and also brought me some shame in others. Over the course of this research, I was asked several times what type of cycle I rode. Research participants often commented on, criticised, or complimented my cycle. Once, someone cleaned my cassette without asking or informing me – as a favour, but also because he was embarrassed about it on my behalf. When I conversed with mechanics, they often described in detail what in their opinion constituted a good-quality cycle, one that would be decent or, by contrast, should not be ridden by anyone. These conversations sometimes led me to hope that they would not catch sight of my own cycle, out of fear that our relations would be tarnished by their realisation that I owned a cycle that would likely not appear to them as a sound and safe machine.

Conclusion

This research was conducted through the use of a wide range of methods. An international comparative study, mixed methods, multi-sited ethnography, participant observation, and auto-ethnographic methods are all employed in order to gather, reframe, and understand the different cycle repair practices occurring in Lyon and Melbourne. This approach facilitates the comprehensive interdisciplinary study of a research topic that has been, until now, underexplored. It results from the intent to grasp the very diverse aspects of cycle repair practices as they occur in many locations of each city, and as a sensorial experience.

This data collection was the result of many choices, related to the boundaries of the study and the nature of the organisations visited. It was also the result of an encounter between the subjectivities of the researcher and the research participants. This encounter was not purely scientific: it also occurred within the frame of affective relationships with people, spaces, and cities. This research has not only consisted in collecting and analysing information about people and practices, but has also intervened in the lives of these people and transformed, at a small scale, these practices. I have myself also been transformed, as a researcher, by this research process and by the numerous encounters that it has brought into my life.

Chapter II: Defining Repair

"If you wake up
And the day feels Broken
Just lean into the crack
And it will tremble
Ever so nicely
Notice
How it sparkles
Down there"

Björk, "It's Not Up To You", 2001

When it comes to discussing repair practices, the first step is to understand what exactly we are talking about when we talk about repair.

Repair and maintenance studies represent a growing area of scientific literature, anchored in science and technology studies, and in many cases, in actor–network theory (Denis, Mongili, and Pontille 2016; Denis and Pontille 2020a). Studies of repair often facilitate the questioning of innovation-centred approaches to technology by shifting focus towards the broader context of technology use and away from the specific moment of innovation (Edgerton 2006). Processes of maintenance and repair underlie the condition of all material objects, which may seem stable, but are in fact constantly decaying and being maintained (Strebel 2011; Edensor 2011). Moreover, when a device breaks down, it shifts the attention of the people involved in using it by drawing focus to the operation of the technology and calling its taken-for-grantedness into question (Graham and Thrift 2007). The purchase price of a technological device is often secondary when compared to the cost of its maintenance over its lifespan (Edgerton 2006). Anthropological research on repair has shown how the lived experience of repair can be a social interaction as well as a technical operation, especially in cases where a professional interacts directly with a customer (Harper 1987; Henke 2000; Crawford 2010).

Paradoxically, the work of repair transforms technological objects as much as it restores them to their original state (Edgerton 2006). This transformation is not only technological, but also social, as it restores the link between the object and its user, as in the case of home furniture renovation (Gregson, Metcalfe, and Crewe 2009). Another transformation occurs in the relationship between the repairer and the repaired object: it involves a specific form of attention to the fragility of things (Denis and Pontille 2020b), along with what could be termed an ethics of care (Batterbury and Dant 2019). It also involves skilled labour and specific expertise (Strebel 2011).

Cycle repair is unusual in several ways. First, the cycle is a modular object that is also "transparent", in the sense that most of its components are very easily visible and accessible. Moreover, it is a practice in which we can find professional and amateur repairers side by side, as well as people who engage in repair practices for different reasons and with different levels of skill. The spectrum of repair is very broad, and the embedding of the cycle as an object in cyclists' daily lives contributes to blurring it. This chapter aims to define repair practices while simultaneously illustrating the ways in which these practices are blurry, ill-delimited, unplanned, and unclear.

To achieve this aim, I pursue two goals. The first is to provide a general picture of repair, its key operations, the tools that it involves, the ways in which repairs are performed, and the most common habits of cyclists in Lyon and in Melbourne. To my knowledge, no previous study has extensively surveyed cyclists in order to illuminate details of their repair habits. The present study accordingly aims to form a basis for further documented discussions of repair in France and/or in Australia.

This overview shows the high number of cyclists who ride cycles that are in need of repair, along with the high frequency of cycle breakdowns and repair, and in so doing, highlights the importance of this topic to the majority of cyclists.

As a second objective of this chapter, I attempt to demonstrate the extent to which repair itself is contested: people who engage in repair sometimes refuse to label it as such, change their minds, create new ways to repair, struggle with it, ask for help but still do things themselves, do

not do enough, ride cycles that they know to be defective without attempting to repair them… This research accordingly aims to reconstruct repair as a blurry object, one that changes meaning and shape according to the context in which it is realised. Without entirely dissolving the object of repair, I wish to show that it is a problematic object.

The first question addressed in this chapter is "What is repair?". In the first section, I focus on the term "repair", along with its antagonist, "breakdown", in an attempt to articulate the meanings that cyclists bring to these terms and the actual practices that they reflect. In the second section, I address the question "How does repair work?", through a discussion of the different types of repairs mastered by Lyon and Melbourne cyclists and the availability of the tools used in repair. I also focus on unexpected experiences of repair and the different ways in which repairers deal with them. The third and final section of this chapter answers the following question: "Who repairs?". Specifically, it addresses the different ways in which repair responsibility is shared: on the one hand, this sharing of responsibility occurs within the cyclist themselves over time, through the choice to maintain or not to maintain their cycle. On the other hand, this responsibility-sharing occurs through the repartitioning of different actors of cycle repair, along with the ways in which cyclists choose to engage with one or another.

1. The Blurriness of Cycle Repair and Breakdown

In this section, I present an overview of what the terms "repair" and "breakdown" may refer to in the lives of cyclists and mechanics.

Overall, the story of repair is rarely as simple as "my cycle broke and I repaired it". I draw examples from survey results and interviews to demonstrate that despite their importance in the lives of cyclists, both "repair" and "breakdown" are blurry concepts that are often difficult to contain within precise limits. Furthermore, in the case of the cycle, the pre-conceived direct link between repair and breakdown is often challenged.

1.a. Characterising Repair and Maintenance

Defining Repair

In this thesis, I use the English phrases "cycle repair and maintenance", or "cycle repair", in order to describe what would be referred to in French as *mécanique vélo*. Other meanings of the term *mécanique* can be translated as "mechanics" or "mechanical" in the English language. In this specific situation, however, the term describes the science of constructing and operating machines[21], a meaning for which the English language has no direct equivalent term at present[22].

Beyond repair and maintenance, *mécanique vélo* also encompasses other operations related to the operation of machines, some of which are more specifically relevant when it comes to cycling. Therefore, in this thesis, the terms "repair and maintenance" or "repair" should be understood as encompassing the following operations:

- Cycle building and construction: frame welding and assembling cycle parts and components together.

[21] « Mécanique : définition. » Dictionnaire Le Robert, URL: https://dictionnaire.lerobert.com/definition/mecanique (accessed March 2022)
[22] For instance, a conversation thread on the forum of the translation website Wordreference indicates that suggested translations of "faire de la mécanique" are "tinkering on a car", "working on a car", "playing the mechanic", and "messing about with cars". URL: https://forum.wordreference.com/threads/mécanique-automobile.2484288/

- Cycle repair: "restoring by replacing a part or putting together what is torn or broken"[23].
- Cycle maintenance: keeping a cycle in an initial state (as of repair, efficiency, or validity), preserving it from failure or decline[24].
- Cycle modification: replacing or adding certain cycle parts. This can include the addition of a cycle rack or a mudguard, swapping one set of handlebars for another set with a more suitable shape, or the transfer of several bike parts from one cycle to another.

This thesis focuses primarily on cycle repair and maintenance; however, cycle building and modification are operations that are often performed in the same spaces, by the same people, and often using the same tools and know-how, as repair and maintenance. Thus, discussions of repair cannot be fully separated from discussions of these other operations.

Moreover, these practices exist on a continuum. For instance, repairing a cycle part may entail replacing it with another part that is not the equivalent of the damaged one, but also has a different use; in such a case, a repair operation would also constitute a modification. Constructing a cycle may also lead to its modification (if, from the outset, a cyclist decides they want a different component from the one initially sold by the brand) or repair (if, during construction, something goes wrong). An operation like tightening a brake cable may also be described as both repair (restoring brakes to their previous good condition) and maintenance (since it prevents further degradation of the condition of the braking system).

Cycle repair is a series of technical operations, but also a social practice. It involves specific know-how, and it can be realised in an informal or a professional setting. It thus often involves a commercial transaction.

Out of these four operations, repair and maintenance have a unique status, since they are related to the vulnerability of the cycle. Indeed, cycles are subject to unavoidable decay over

---

[23] "Repair: definition." Merriam-Webster dictionary. URL: https://www.merriam-webster.com/dictionary/repair (accessed March 2022)
[24] "To maintain: definition" Merriam-Webster dictionary. URL: https://www.merriam-webster.com/dictionary/maintain (accessed March 2022)

time and may break down in unexpected ways, as in the case of punctures.

An analysis of cycling practices and velonomy cannot be performed without addressing the ways in which cyclists deal with the slow decay of their cycle and its components, which age, become punctured, rust, loosen, or shift slightly, thus creating friction. Indeed, it is possible to consider objects and infrastructures as the outcome of constant processes of decay and maintenance (Graham and Thrift 2007). The action of bringing processes of maintenance and repair to the foreground, to which this thesis contributes, participates in what Steven Jackson calls "broken world thinking" (2013). According to this author, and to repair studies scholars, the understanding of the material world and of the phenomena that take place within it can only be achieved through observing processes of maintenance and repair. A study of cycle maintenance and repair is therefore essential, not only to understand what constitutes a good use of the cycle without mechanical issues, but also to understand what exactly this vehicle is and how it comes to be in its current state in a given social context. Cycle maintenance also presents an opportunity to reflect on the role played by care and affection for material objects in cycling practices. This is what is argued by Batterbury and Dant:

> Repairing a bicycle enhances the mobility of the user, engages her or him with how and what it is made from and how its useful life can be extended to save the energy and raw materials needed to replace it. When someone voluntarily helps to overcome its brokenness, it is an act of kindness and care between those with skills and the bicycle user. The material interaction between the experienced repairer and the bicycle mediates a social relationship of care with the user of the bike, responding to both the material disorder of the machine and the practical disorder in the life of the cyclist. (Batterbury and Dant 2019: 250)

Now that the central and heuristic role of the study of repair and maintenance has been established, it is important to focus more closely on the characteristics of these practices.

Edgerton suggests that maintenance and repair are thorns in the foot of the people who engage with them, due to their complexity and uncertainty:

> Although central to our relationship with things, maintenance and repair are matters we would rather not think about. Mundane and infuriating, full of uncertainties, they are among the major annoyances surrounding things. The subject is left in the margins, often to marginal groups. (Edgerton 2006: 77)

Following Edgerton, I argue that cycle repair and maintenance are blurry, as they can be either or both formal and informal processes, often have unexpected outcomes, and often require adaptation to a specific situation.

Formal and Embodied Processes of Repair

Repair requires forms of technical learning that involve explicit and implicit knowledge, theoretical and embodied skills. It is a technical operation, namely an operation related to the operation of a technical object: the cycle. As such, it involves knowledge and know-how. Not every kind of knowledge is "know-how": know-how is knowledge as applied to a specific task (for instance, riding or repairing a cycle). Discussing the know-how of repair means discussing the development of applied skills, and allows for conceiving knowledge as not only theoretical, but also situated and distributed between people and technical objects (Akrich 1992; Shove and Pantzar 2005).

The nature of repair is related to the way we understand knowledge to operate. One way to discuss know-how is by comparing it to theoretical knowledge through the distinction between explicit and implicit knowledge. This distinction is based on whether the person who has this knowledge is aware of and able to articulate it (Masters 1992). Cycle repair can be both explicit and implicit knowledge.

Cycle repair as explicit knowledge is embodied through the many repair manuals and tutorials that outline the different rules and steps involved in a given operation, along with hacks and tips. Amateur and professional mechanics alike often refer to these steps and rules, which then appear as universal. When considered as the application of a formal process, repairs are well-

defined in time: they have a beginning and an end. It is possible to conceive of them as a series of steps that can be rigorously followed until the problem is solved. This is the way in which Florian, who works in a factory in the field of machine repair, conceives of repair processes:

> *Before an operation, one needs to gather some information to know where to go, and once this work is done, I think that anyone is able to do it, as long as they manage to… create a sequence, I mean, in my work, that's what we call it. It means that in step one, you undo this nut, that nut, in step two, you do this and that, and then once the sequence is realised, well, anyone can do it – if one complies with the steps, it's impossible to do it wrong. This is exactly what you find in a tutorial.*[25]

Florian, cyclist, Lyon

Research in psychology has brought up some links between explicit knowledge and the nature of the process during a technical operation. Masters suggests that we can differentiate between a cognitive phase and an autonomous phase:

> In the cognitive phase, knowledge is explicit and rule-based, and performance is slow, erratic and requires much effort. In the autonomous phase, knowledge is implicit and non-verbalizable, and performance is smooth, effortless and fast. This basic distinction is common across a number of more recent theories of skill acquisition. (Masters 1992: 343)

Know-how based on explicit knowledge thus leads to a slower and less efficient achievement of practical tasks such as cycle repair. A similar approach, albeit one based in the phenomenological rather than psychological literature, is described by the sociologist Tim Dant.

---

[25] « Avant une opération il faut se documenter pour savoir par où on va passer, et une fois qu'on a fait ce travail documentaire je pense que n'importe qui en est capable, du moment qu'il arrive à… créer une gamme, enfin dans mon travail on appelle ça, c'est à dire l'étape une, tu dévisses cette vis-là, cette vis-là, étape deux tu fais ci, ça, ça. Et après une fois que cette gamme est bien faite, ça peut être donné à n'importe qui de le faire, en la respectant on peut pas se tromper. Ce qu'on retrouve dans un tuto c'est exactement ça. »

When researching car repair practices, he suggests a split between "intentionality of act" and "operative intentionality" (Dant 2005). According to him, "intentionality of act" is when the person engaged in the action makes the intentional decision to execute an operation. Here, again, intentionality of act is linked with the use of explicit knowledge: for instance, when a mechanic decides to follow each step in a tutorial or handbook. Operative intentionality is the type of process during which the body of the repairer is aligned with their specific intentions. In phases of repair that proceed according to operative intentionality, the repairer operates based on their existing habits and previous experiences that have been incorporated into their movements:

> The concept of 'operative intentionality' spreads the mindedness of intentionality to those acts of which I would not readily say 'I intended to do that' but which I nonetheless take ownership of as being mine and not the result of some alien beast working through me. [...] Operative intentionality incorporates habits and the adoption of cultural practices and ways of doing things which are treated as 'natural' and not subject to question in the routine course of life. (Dant 2005: 100)

The process of incorporation means that as the repairer becomes more confident, their gestures involving tools become more spontaneous and automatic, as if the tools used were incorporated into the body of the repairer. The tools thus disappear from the repairer's attention, as the repairer becomes engrossed by the outcome of the technical action rather than the tool they are using for this aim (Warnier 1999).

A focus on this process of incorporation allows for a deeper understanding of Master's assertion that the technical process of repair is linked with the nature of knowledge. When people begin to acquire repair know-how, they need to regularly refer to explicit knowledge in order to add structure into a process that can be difficult to predict. This is why most maintenance workshops I attended included a discussion of step-by-step instructions for standard repairs. Beginner mechanics often refer to such instructions, or to tutorials (Dant 2019). This role of processes in

learning repair know-how is, for instance, described by Juliette:

> *When performing a general service, I was taught to be really methodical, because I was all over the place and then I forgot stuff. For instance, my manager gave me a great tip, because I'm such a geek. He said, "pretend you're scanning the bike". And it works really well – so every time I service a bike and I think that I'm done, I scan it again, so I start with the back, [then] the middle part and the front part, and that's how I really see what I've done and what I've forgotten. It's like I was saying earlier, it's being super methodical. Each time I start with the derailleur, I clean the transmission, then you check the gears, the wear, and then you do the bottom bracket…*[26]
>
> Juliette, mechanic, Lyon

Explicit knowledge and lists or steps can be used to support a mechanic's process of acquiring and maintaining know-how. The respect for explicit rules and for performing repairs in a given order can also be considered a sign of the quality of a mechanic's work. For instance, one mechanic stated that rigor and caution were among the key values that mechanics should possess. According to him, being able to be tidy, to remove part after part and line them up so that it would be possible to fit them back in the same order, was a characteristic of a good mechanic, someone who abides by the right processes:

> *Some people are messy: they survive, but they struggle, and their work is far less good.*[27]
>
> Rémi, mobile mechanic, Lyon

---

[26] « Quand tu fais une révision, moi ils m'ont vraiment appris à être méthodique parce que moi je partais un peu dans tous les sens et après j'oubliais. Bah par exemple, mon responsable, il m'a donné une super astuce, moi qui suis une grosse geek. Il dit, "fais comme si tu scannais le vélo". Et ça marche vraiment bien, du coup chaque fois que je révise un vélo et que je pense avoir terminé je le rescanne, donc je pars de l'arrière, le milieu et le devant et là vraiment je vois ce que j'ai fait et ça permet de voir ce que t'as oublié. ça rejoint ce que je disais tout à l'heure, c'est être hyper méthodique. à chaque fois ce que je fais c'est, je commence avec le dérailleur, je nettoie la transmission, après tu vérifies les vitesses, l'usure, et après tu fais le pédalier… »

[27] « Il y a des gens qui sont brouillons : ils survivent mais ils galèrent, et ils travaillent beaucoup moins bien. »

This approach to explicit knowledge echoes Orr's study of technicians, who, according to him, can develop bad reputations in their workplace if they apply unsystematic approaches to problems (Orr 1996).

Standard processes bring some homogeneity to repair practices: they allow for the development of a shared understanding of how repair works. Some people associate each type of breakdown with a standard series of repair steps, which is accessible through rigor and method. For example, one survey respondent describes their last repair in the following way:

> *Well… I mean, a puncture: I rode across something sharp, I got a flat tyre, I stopped, I removed my wheel, removed the tyre, removed the inner tube, took my replacement tube, checked the tyre, installed the new tube, put the tyre back, inflated the tube, put the wheel back on.*[28]

This cyclist seemed surprised to hear that they needed to describe what had happened to them in a little more detail. To them, "puncture repair" means performing the exact same process each time a puncture occurs, such that describing it feels superfluous. In this case, standard repair steps are only mentioned for the sake of communicating them to the researcher; the cyclist indicates that they have such familiarity with these steps that listing them is not required, since they feel so natural.

Repairers often resort to formal and explicit knowledge in different ways in order to support the repair process. Their ease with a specific type of repair operation mediates the form taken by the repair process, along with their need to use explicit knowledge.

Unpredictable and Blurry Repair

[28] « Bah… une crevaison quoi: j'ai roulé sur je ne sais quoi de pointu, j'ai crevé, je me suis arrêté, j'ai démonté ma roue, déjanté le pneu, retiré la chambre à air, ai pris ma chambre à air de rechange, ai vérifié le pneu, installé la chambre à air, remonté le pneu, gonflé la chambre à air, remis la roue en place. »

The formal processes discussed above do not cover the entirety of the repair experience. Indeed, reality sometimes gets in the way of a clear and simple theoretical repair process, meaning that this process can become unpredictable or blurry.

Indeed, repair involves not only solving an issue, but also diagnosing it. Diagnosis is something that is extremely complex, requiring sensorial skills (Krebs 2012) and a deep knowledge of the workings of the whole cycle that goes beyond the specific broken component, and cannot be easily automated (Dant 2010). Further issues may arise from the unavailability of components or tools, of from a repairer's lack of knowledge regarding a specific model of a cycle.

The first element of the unpredictability of repair is its varying length. The process of repairing a cycle can take anywhere from several hours to days or sometimes weeks. For instance, I once experienced a very long repair process: I got a puncture, far away from my home and any repair places that I was aware of, while riding without tools. I then borrowed some tools, but found they were not adapted to the exact shape of my cycle, then fixed the puncture, but then realised that there were many holes in the tube. Almost every day, I came back to the location in which the broken cycle was waiting, tried something new, and discovered a new problem in the repair process; this situation lasted for over a week, until I managed to carry the cycle to a community workshop, where I was able to access the help and materials I needed to complete the repair (Figure 2.1).

Figure 2.1 – Coming back at night for another repair attempt after the previous one failed.

Although this (fortunately) is not the most frequent experience, some of the survey respondents described multi-step repairs, for instance:

> *"Chain broke on way to work. Had to use chain breaker and fix. Then rode on. Then bike shop fix."*
>
> *"I had old tyres and I got a slow puncture. I pumped up the tyre and it got me to where I had to go, and I had a spare tube, but no pump, and had to walk quite a long way to a service station to get access to a pump"*

Often, someone will visit a community workshop hoping to get their cycle repaired, but emerge with more issues than when they came in. One reason for this is that some community workshops hold their pedagogical role in high esteem, and encourage learning experiences over the strict resolution of a problem. Community workshop volunteers sometimes discuss the difficult choice between solving someone's mechanical issue for them and letting them struggle and learn.

Another aspect of this blurriness is the unpredictable outcomes of repair. Repairs, which are theoretically supposed to return cycles to their pre-breakdown condition, rarely achieve this in reality (Denis and Pontille 2012). In the case of cycles, a repair may create issues when a component is removed for repair or replacement and then has to be fitted back again; for example, it may occur that a cyclist repairs a puncture, but does not sufficiently tighten the wheel when fitting it back on the cycle, causing friction and possible impedance to riding, or even another puncture. Moreover, repair may cause bolts, screws and cables that were already in an average condition to further deteriorate, even to the extent of causing some other cycle components to break down. For instance, I once damaged the tyre of my cycle by taking it out of a wheel while attempting to fix a punctured tube. Thus, although the tube was repaired, I now had to replace the tyre before I could ride the cycle again. One survey respondent shares a similar experience, this time involving chain replacement:

> *I appreciated this moment of repair, but I did not put the chain back right, which led the bike to stop working completely 24 hours later (the chain came off instantly as soon as I started to pedal). Consequently, someone else ended up repairing it for me (a friend).*[29]

As a consequence of this sometimes-complicated process of repair, the results of a repair may be unexpected. Indeed, unlike the smooth and expected process of repair that some people dream of, and that was described above, even some professional mechanics are sometimes

[29] « J'ai apprécié ce moment de réparation, mais j'ai mal remis la chaine, ce qui a conduit au fait que 24h plus tard, le vélo ne fonctionnait pas du tout (il déraillait instantanément dès que je commençais à pédaler). Par conséquent quelqu'un d'autre a fini par le réparer pour moi (un ami) »

unsure about the future result of a repair. Some even take a gamble when agreeing to repair a cycle:

> *I had just enough skills to have the ability to say yes when someone came in saying, "can you fix this for me?". Even now, something comes up that I haven't really seen much before. A few years ago, people came to me and asked, "do you do disc brakes?", because disc brakes were fairly new, and I said "oh, yeah, yeah… for sure" [laughs], but if they asked me "How do you do disc brakes?" I would say, "Oh I'm gonna work it out myself".*
>
> Dave, mechanic, Melbourne

Repair is thus not a given action, required by cyclists at a given time, that proceeds according to an unchanging set of steps; rather, it is an unstable, sometimes lengthy and problematic, process.

Flexible Repair

The unpredictability of repair means that repairers need to adapt to the circumstances of the repair process, to the ways in which it changes, and to the specific material conditions of a particular cycle. In this way, repair becomes a dialogue between the repairer and the cycle, a process enabled by the cycle and its design. This is a process described by Owen Dowsett:

> The bicycle, then, is an object that allows for knowledge about its inner workings to be accessed and embedded in the tacit knowledge of the mechanic. Its components provide ready indication of whether they are willing to work together and they provide subtle multi-sensual hints about how their collaboration might be brought about. Indeed, it is not only that old knowledge is extracted from the bicycle/mechanic, but that new knowledge is also imposed/embedded. The flexibility of the bicycle, and the honing of skill, mean that elements can be brought together in new ways and that new solutions can be found. (Dowsett 2012: 23–24)

Repair can thus be conceived as an exploration, in which the cycle and the repairer act together to achieve a resolution of the mechanical issue. This fiddling is also characteristic of the "learning by doing" that is common in the field of cycle repair. One example of a repair that was performed without following standard processes is related by Olivia:

> *Yes, the two big chainrings, uhm, they were bolted together, and he'd lost a couple of the bolts that was holding them together. So they weren't in alignment, they were wobbling a little bit, and then he couldn't change gears, or it stayed stuck in-between or something. See, and even with something so simple, you know. People stop riding and say, "oh, it's getting stuck!". Just take a moment, and have a look, turn the pedals slowly while you're looking at it, and then you can go, "oh, this shouldn't go like this, oh look, I've been missing three bolts".*

Olivia, cyclist, Melbourne

Another example of such an exploration was provided by Karen, who describes the steps of her exploration when she found out that the battery of her electric assisted cycle was not working:

> *When I went home, I looked up the manual, and I thought that the problem might be a sensor that is attached to the back wheel. So I adjusted the sensor, but it wasn't what the problem was, it was just that somehow the battery had actually come loosened off, the bits weren't meeting each other. My first response was to look and see if it is something that I can do, particularly because if it's broken, I have to get it somewhere, and it's not necessarily convenient. I went on with looking, thought that maybe it would be a wire, and eventually saw that it was sort of the battery… so the battery sits basically where the bike rack is, it is just a flat thing underneath the rack, and I saw that it was sitting kind of funny. So I just unlocked it and put it together again and locked it up, and that worked [laughs].*

Karen, cyclist, Melbourne

In this case, Karen resorted first to formal instruction, following the manual that had been provided to her when she purchased her cycle. However, when this did not appear to be sufficient, she explored on her own and inspected the whole system, following the wire until she noticed something unusual. Of course, this was made possible by her pre-existing knowledge of electrical systems, which allowed her to understand that electricity circulates through wires, and that each element of the system is connected to every other element. Although this basic electricity-related knowledge, commonly applied when an electronic device fails, is not usually considered standard cycle repair knowledge, in this case it could be translated to the specific situation of cycle repair. Similarly, people who have no training in cycle repair can find themselves able to perform a repair without outside help – broad knowledge on how to tighten a bolt, what a crack looks like, how a wheel should turn, and how to assess which part in a basic mechanism is bent or damaged can translate to cycle repair know-how. Because of this, repairers are often able to execute some repairs that they have never performed before.

The flexibility of repair and its dependency on the context has led to the appearance of many different repair methods for some operations. This is why one mechanic stated that she had tried to develop a repair practice that acknowledged these diverse approaches:

> *The health industry, they've got quality standards that they've got to adhere to. But the bicycle industry, there aren't any formal standards. It's the type of industry where everyone goes, "no, that's not how you do it". That's what I don't like about it. [...] I'm trying to change it to say, "there are different ways, but from my experience, this is what I recommend."*
>
> Barbara, mechanic, Melbourne

After this initial overview of the concept of repair, which will be explored further both later in this chapter and throughout this thesis, I would like to introduce the idea of "breakdown" as it applies to Lyon and Melbourne cyclists.

1.b. Characterising Breakdown

> Failure can be both – embedded in and disruptive of everyday life. It is hard though to measure the depth of a failure, and also of our altered mood, but it is worth examining instances of error and failure, as an exercise of critical breaking. The world touches us through failures. Brokenness feels like something, but one does not know what it looks like, and even less how to verbalise that something. Modern societies lack a language in which to discuss failure beyond economic reasoning. (Martínez 2019)

In order to apply the "broken world thinking" mindset to an analysis of cycle repair, it is important to first understand what a "broken cycle" is and how exactly it is experienced by cyclists. As argued above, this is central to the definition of repair as distinct from maintenance, since repair occurs after a breakdown, while maintenance takes place preventatively (before the cycle is considered to be broken).

In addition to that, the vulnerability of cycles (unlike a car, most of their components are exposed) and the fact that they are often parked in the street – and thus exposed to both rust and damage from vandalism or the theft of components – means that cycle breakdown is an extremely frequent occurrence. I asked cyclists about "the last time your bicycle or one of your bicycles started being dysfunctional in a minor or serious way, or broke down". Although 5% of respondents had never experienced any mechanical issues with their cycle, a quarter of all cyclists surveyed had encountered such an issue in the previous month, while half of them reported issues in the last three months (Figure 2.2). Overall, only 17% of all cyclists surveyed had encountered no mechanical issues in the previous year.

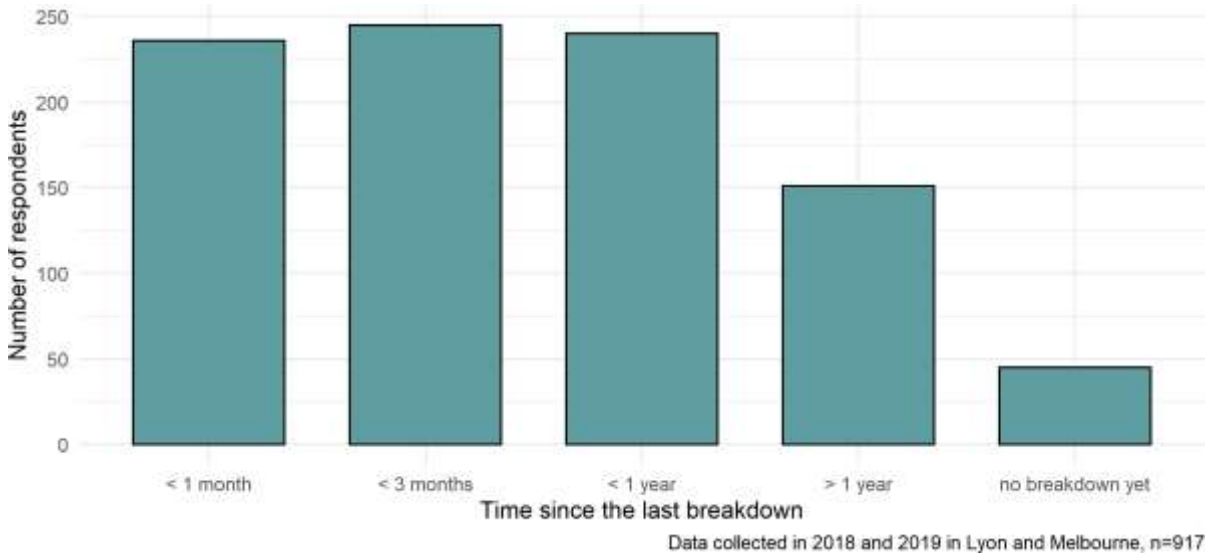


Figure 2.2 - Time since the last breakdown or instance of cycle dysfunction

Data from the cycle repair survey shows that cyclists who mainly ride a second-hand cycle are more likely to have experienced a mechanical issue in the last month, and less likely to have gone one year without a breakdown (or to have experienced no breakdowns at all). This is likely the reason why the survey results show that Lyon cyclists, who are more likely than Melbourne cyclists to ride second-hand cycles, are also more likely to have experienced a breakdown in the past month. Furthermore, owning a higher number of cycles is positively correlated with having experienced a mechanical issue in the previous year. For instance, when asked to describe their last mechanical issue, one survey respondent answered: "I have many problems. I have a lot of bikes."

Among the hundreds of survey respondents asked to describe, in a few words, the last mechanical or functional issue that they encountered, the extremely wide array of answers is striking. The next subsections explore some characteristics of breakdowns. I first argue that breakdowns are blurry and difficult to delimitate, then focus on some reasons for this blurriness.

The Blurriness of Breakdowns

Scholars have argued that the identification of breakdowns is the outcome of a negotiation process (Rosner and Ames 2014). This has also been observed in the case of cycle breakdowns, which are "elusive and non-standardised" (Tironi 2019: 197). This overview of cycle breakdowns, and of how they are experienced by cyclists, expands on this statement by outlining the different aspects of this negotiated delimitation, or blurriness, of breakdowns. The observed blurriness of breakdowns operates at many levels.

Indeed, breakdowns often occur in a single component, but affect the operation of the whole cycle; they can be sudden, but are often the result of a process of deterioration that takes place over time, in a way that makes it challenging to identify the specific moment of their occurrence. The definition of brokenness is also blurred by the existence of the large number of cyclists who ride dysfunctional cycles, along with their diverse ideas of what constitutes a "working" cycle. All of these examples are discussed in more depth in the following subsections.

Another aspect of breakdowns that contributes to their uncertainty in the lives of cyclists is the doubts that sometimes exist regarding the origin of a breakdown. In some cases, the reason why a breakdown occurs cannot be identified by either the cyclist or the people contributing to the repair. Many breakdown stories mention a lack of understanding of the reason for a mechanical issue:

> *"Brand new bicycle started creaking after first service. Took back to bike shop and they couldn't fix it. They sent it back to Specialized, who couldn't figure out what the problem was, but it mysteriously disappeared."*
>
> *"The derailleur ended up in a strange position after an unknown event"*[30]

This is more specifically the case with punctures; since urban roads are sometimes strewn with invisible sharp objects, it is quite common that even new and good-quality tubes and tyres will be punctured, as compared to other cycle parts, which are rarely subject to sudden dysfunction. Puncture repair may also, if done without caution, cause new mechanical issues, contributing

[30] « Le dérailleur est passé dans une position bizarre suite à un évènement inconnu »

to an overall sense that breakdowns occur due to random bad luck, and the belief that cyclists should be prepared to face mechanical issues at any time while riding:

> *"I had a few quick flats in a row, so I bought a more expensive brand of tube, which may have worked, or just lucky"*

Another aspect of the blurriness of repairs is the existence of repeated breakdowns. Indeed, breakdowns can linger in the lives of cyclists by occurring repeatedly: this may indicate a structural issue in the condition of the cycle, or that a repair was not performed correctly, or may in fact simply be due to bad luck. In these cases, cyclists experience a series of breakdowns as one very long breakdown:

> *"Chain coming off repetitively due to a chain that was not tensioned enough"*[31]
>
> *"Frequent puncture meant a problem with the wheel, so husband swapped wheel with a spare we had."*

One final aspect of the uncertainty of breakdowns is that their definition depends on the context in which the cyclist finds themselves. One survey respondent reported that "Worn-out brakes meant [they] found it dangerous to ride in the rain". In this case, the respondent only considers their cycle to be broken when it rains; like the perception of a need for repair, the perception that a breakdown has occurred may depend on the weather.

Overall, cycle breakdowns are hard to delimitate in time and space. They occur in unclear and sometimes ambiguous ways. The rhythm at which cycle components wear down can be both slow and surprising. This blurriness of cycle breakdowns echoes the blurriness of repair.

Modular Breakdowns

An essential characteristic of cycle breakdowns is their modularity. Aside from cases of

[31] « Déraillages à répétition à cause de la chaine pas assez tendue »

spectacular crashes, cycle breakdowns rarely involve the breakdown of the whole cycle. The cycle is a modular object, comprising an assemblage of interrelated parts. What is commonly referred to as "cycle breakdown" is usually the breakdown of a single component. However, the interrelation of the cycle's components means that the breakdown of one part has consequences for the system as a whole, and that the repair of this part may require repair and diagnosis of this system. In many cases, a breakdown of a small component can prompt the conclusion that the whole cycle is "broken".

The modular nature of cycle repair may sometimes lead to strange situations. One example of this relates to an event that I attended with a volunteer at a Melbourne community workshop, which was organised by a "repair café". The label "repair café", first used in the Netherlands in the late 2000s, refers to an event to which people can bring their household items and repair them with the help of volunteers. The community workshop was invited to participate in the event so that people could bring in their cycles, alongside their broken kettles and smartphones, for repair. One principle of this event was that, after each repair, participants needed to weigh the repaired object. Participants and volunteers were then required to take a photo together with the repaired object and a label reading "fixed!". This photo would then be used for further promotion of similar events. These unusual requirements caused a lot of unease among volunteers, some of whom referred to them as "red tape" in emails. It also felt very uncomfortable to so proudly declare that we had "saved" the whole weight of a cycle "from landfill", when all we had done was fit a new bell onto the handlebar. In such cases, it was obvious that the owner of the cycle would not have thrown it away because of the absence of a bell; it is most likely that she would have continued riding without it, just as she had been doing the previous month.

The modularity of breakdowns is unevenly perceived by people involved in different ways with repair. Indeed, engaging with repair involves a specific type of attention that addresses the broken object as an assemblage of different elements (Edensor 2011). In the context of cycle repair, and in cases in which users and repairers are different, it can occur that cyclists consider their cycle to be a single broken object, while the professional mechanics that engage with it tend to address more specific components. Where some unskilled repairers might see a "cycle",

skilled repairers see an assemblage of tyres, rims, brake callipers and pads, cassette, derailleur, gears and brake cables, and so on.

Sudden Breakdowns

Another aspect of cycle breakdowns is that they can be either sudden or progressive: in short, they can be the result of a shock, an accident, or of slow and progressive wear and tear.

Sudden breakdowns feature predominantly in people's minds, since the fear of accident and injury is among the strongest deterrents to cycling (Horton 2007). Indeed, as demonstrated by one study in the United Kingdom, cyclists experience very few incidents that lead to an injury, whereas what Aldred and Crossweller call "near misses" are a weekly experience for most cyclists (Aldred and Crosweller 2015). This is also true both in Lyon and in Melbourne, where 337 and 391 cycle accidents respectively were reported to the authorities in 2019, corresponding to the death of five cyclists in each city ('Accidentologie Routière Bilan 2019' 2020; 'Bicycle Rider Statistics' 2020). According to Aldred and Crossweller, the most frequent incidents involve a vehicle blocking a cyclist's way forward, passing them dangerously, or pulling out or in across the cyclist's path. All of these incidents may result in damage to the cycle, as related in the following examples:

> *"Trying to stop to avoid a car as it pulled out of a side street, I was balancing on the front wheel for a while before I lost it and smacked the handlebars into the deck"*
>
> *"Night, lack of visibility, excessive speed, ill-adjusted brakes, collision with another cyclist"*[32]

Twenty-seven respondents to the cycle repair survey (12 in Melbourne, 15 in Lyon) described recently being hit by a car. Moreover, many others described crashing into a wall, a kerb, a friend of theirs, or another cyclist. Overall, 16% of cyclists stated that their last mechanical issue

[32] « Nuit, manque de visibilité, vitesse excessive, freins mal réglés, collision avec un autre cycliste »

occurred following a shock or an accident.

In addition to these crashes, less common events may include a cyclist parking their cycle in good condition in the evening and then finding it broken in the morning. This may happen either intentionally (attempted theft), accidentally (a car driving into a parked cycle), or as opportunistic entertainment (drunk people breaking or removing cycle components for fun). Over the last five years, all three of these events have happened to me, and many survey respondents shared similar stories:

> *"Found bike mangled but left tied to pole"*
>
> *"Someone badly buckled the back wheel of my bike, probably by hitting it during the night (it is locked to the staircase of my building)"*[33]

Both in Lyon and in Melbourne, it is common to see cycles in the street that have been vandalised and/or are lacking certain components, and that seem to have been in this condition for months or even years, as the owner has not had the time or inclination to replace the stolen or broken part, or alternatively has abandoned the cycle completely (Figure 2.3). Such discarded cycles are present in most cities in the world, such as in Copenhagen (Larsen and Christensen 2015).

[33] « Quelqu'un a voilé la roue arrière de mon vélo très fortement en tapant surement dedans durant la nuit (il est attaché à l'escalier de mon immeuble) »

Figure 2.3 – Vandalised cycles out in the street in Lyon

In addition to crashes and vandalism, flat tyres are an extremely common type of sudden breakdown. Paradoxically, given their name, flat tyres are typically caused by the puncture and deflating of the inner tube located inside the tyre. Overall, 30% of respondents stated that the last mechanical issue they experienced with their cycle was a puncture. Punctures may occur due to riding over broken glass or another sharp object in the street, but can also happen in the course of normal use, when the tyre becomes worn or deflated and the cycle rides over uneven ground. In some cases, worn tyres can even create punctures. Most cyclists describe such events without further detail ("flat tyre"), as this type of breakdown and the associated process of repair are considered very ordinary. Others provide more details: "Simple puncture from a thorn, easily fixed". Overall, most cyclists consider punctures to be a normal part of their riding experience.

Wear and Progressive Breakdowns

Although many people consider that most cycle repairs are performed following sudden breakdowns, this is in reality rarely the case. Indeed, only a third of all mechanical issues discussed by survey respondents prevented them from using the cycle at all, while for 51% of respondents, the last issue that they encountered was either minor or cosmetic, having only a small impact on their use of their cycle. Rosner and Ames (2014) suggest that the identification of breakdowns follows a continuum, with different users focusing on different components of a technological object when assessing its brokenness. Quite often, the deterioration of cycle components occurs in a subtle, progressive way over a long period of time. However, cyclists' attention to this deterioration is rarely so constant; this is in line with the argument quoted above, articulated by Graham and Thrift (2007), according to which a material object or technical device rarely draws attention to itself unless it does not work as expected. Similarly, a cycle that is progressively decaying often only draws attention from a cyclist when it reaches a certain threshold of dysfunctionality.

Thus, in some cases, this usual wear is noticed all at once when its impact on a cyclist's riding becomes sufficiently apparent. It can however also occur that cyclists notice the increasing issues with their riding over time, and only act when they consider that the problems have worsened beyond what is acceptable to them. In any case, cyclists who attribute the breakdowns that they experience to wear and tear also consider them as "normal" and not a source of worry, even though they do in some cases correspond to very serious mechanical issues:

> *"Normal wear and tear to mountain bike. New drivetrain required."*
>
> *"If you ride every day, the brakes become consumable. And the gears come out of alignment with time."*[34]

[34] « Si on fait du vélo tous les jours, les freins deviennent du consommable. Et les vitesses se dérèglent avec le temps. »

Indeed, a breakdown often extends over time: either the cyclist takes time to realise something is broken, or they ride for weeks, months, and sometimes even years, while being aware that repair would improve the condition of their cycle. In fact, 47% of all cyclists surveyed agreed with the sentence "My current riding experience could be improved by some repair of my bicycle". This indicates that a high number of cyclists ride cycles that they consider to be in need of repair, but do not consider broken. The gradual aspect of many wear-induced breakdowns opens the door to interpretation on the part of the cyclist, who needs to decide what level of wear is unacceptable and should lead to a replacement of the worn component. Making this judgement can be very difficult, which is why repairers often use rules of thumb in order to identify whether wear has passed a certain threshold, above which the component is considered "broken".

Riding Broken Cycles?

In addition to the difficulty associated with assessing, over the course of a gradual process, what the threshold of "brokenness" might be, some cyclists consciously continue to ride a cycle that is, in their opinion, dysfunctional. Eleven per cent of survey respondents strongly agreed with the sentence "My current riding experience could be improved by some repair of my bicycle"; this indicates a high number of cyclists who ride cycles that most people, and sometimes even the respondents, would consider broken:

> *"My bike makes a clink-clank sound and my brakes scream."*
>
> *"The chain came off, then the derailleur got stuck. I still have not repaired it. Besides, the brakes are rather loose."*[35]

Some cyclists reported repairing their cycle, but not completely: "I fixed it enough to be rideable,

[35] « Le vélo a déraillé puis le dérailleur s'est coincé. Je n'ai toujours pas réparé. Par ailleurs les freins sont très peu serrés. »

but it still sucks". Others, when faced with an issue, did not act on it, but instead adapted the way they moved around: for instance, by using another cycle instead, or a different means of transport altogether.

In the course of my fieldwork, I came across many cyclists who seemed content to ride dysfunctional cycles; at the extreme end, one Lyon cyclist blithely reported riding a cycle on a regular basis that had only one pedal. Although the situation is rarely so dire, this example illustrates the fact that, for a variety of reasons, it is common for cyclists to ride cycles that are in poor condition instead of performing a repair:

> *"The back brake does not work any longer. I must replace the part. I have been riding without a back brake for over 6 months, I think. I got used to the front brake."*[36]

How can we interpret this phenomenon of cyclists riding "broken" cycles? A fellow researcher suggested to me that it could indicate a lesser relationship with their cycle, as cyclists eventually come to think that the condition of their cycle does not really matter. However, my interpretation differs: instead, I believe that by regularly riding "broken" cycles, cyclists shift the meaning of "brokenness", transforming what others would find unacceptable into a normal riding experience.

A paradoxical consequence of the widespread occurrence of riding cycles that are in rather poor condition is that, when they are repaired, a cyclist may feel like they are riding a cycle that is "like new". A long-overdue repair can thus be experienced as a highly enjoyable event for someone who usually rides a badly deteriorated cycle and experiences this as "normal".

1.c. Co-defining Repair and Breakdown

After characterising repair and breakdown, I wish to focus on the intertwining of both of these elements. In this subsection, I attend to specific data collected during this fieldwork in order to

[36] « Le frein arrière ne fonctionne plus. Je dois changer la pièce. Je roule sans frein arrière depuis plus de 6 mois je pense. Je me suis habitué au frein avant. »

suggest that, quite often, repair and breakdown co-exist in the same time and space, and moreover sometimes constitute each other.

First, this intertwining between repair and breakdown appears when considering the breakdown-related experiences of cyclists with diverse repair skills. Interestingly, data from the cycle repair survey indicates that cyclists who are more at ease with repair are also more likely to have experienced a mechanical issue in the previous month. One reason for this is that, as demonstrated by the cycle repair survey, cyclists with more repair experience tend to own more cycles on average than less experienced cyclists, and thus need more repairs. Moreover, more experienced repairers can more readily diagnose breakdowns and mechanical issues. Being skilled at repairs contributes to better diagnosis, and thus to identifying mechanical issues in situations where a less experienced cyclist would have thought their cycle to be perfectly functional. Thus, in a way, being experienced with repairs may lead cyclists to experience "more breakdowns" on their cycles, in that they are more likely to notice them or label them as such.

The link between breakdown and repair is also sometimes a causal mechanism. As breakdown usually makes repair necessary, it is also possible for repair to create a new breakdown. For example, it may occur that a repairer has made some mistakes, has forgotten some important element of the repair, or that their intervention on a specific component have caused some issues on another one:

> *"After bike had been in for a 'full service' at the bike shop – my headset was loose, 2 spokes broke, and one of my pedals was coming off."*
>
> *"A repair with a self-adhesive patch held for a few months before breaking down again"*[37]
>
> *"I replaced the tyres myself, but made a mistake and aligned the brakes so that when I next rode, they caused a puncture and a hole in the tyre."*

[37] « Une réparation avec une rustine autocollante a tenu plusieurs mois puis a lâché. »

Two other phenomena highlight the tight link between breakdown and repair: the parallel intensities of these events, and the action of diagnosis as it co-creates both repair and breakdown.

Parallel Intensities of Breakdown and Repair

The gravity of a breakdown is often constituted in the experience of cyclists by the difficulty of repair.

For example, consider the following statement by one cyclist respondent: "It… it wasn't really a repair, I just put the chain back on. Very quick and easy!". When the chain of a cycle falls off, the cycle becomes completely unusable. To this cyclist, however, the repair in question was so easy that the chainless cycle ought not have really been considered "broken", meaning that the term "repair" itself was excessive regarding the nature of the operation performed. By contrast, I have met people who considered that a cycle with deflated tyres was "broken", because they did not know that it only required a few seconds and a pump to bring it back into operation.

A similar argument regarding the parallel intensities of repair and breakdown was presented to me by a cyclist who reported that she had a cycle that worked well, but that she did not feel confident and worried because it had not been serviced professionally. In the end, she bought a new cycle that she started using every day. In the same way that, for the cyclist cited above, the existence of a "breakdown" properly so called needed to be validated by the requirement for a "serious" repair, in this situation it was the absence of a breakdown – which could have been assessed by the fact that this cyclist found that it worked smoothly – that had to be confirmed by a repair professional.

Diagnosis: A Step of Co-defining Repair

A key step in repair is that of the diagnosis itself. Identifying what exactly needs to be repaired is a difficult task. Diagnosis is a specific moment in which repair and breakdown come together,

as the mechanic attempts both to identify and to delimit the scope of the breakdown.

Diagnosis is thus an essential aspect of repair; it is present throughout the entire process, since mechanics constantly monitor the condition of the cycle in the course of the repair, up until the final checks usually conducted once the process is complete. Martin Tironi suggests that cycle repair is "a fragile act of permanent investigation". He cites Stark, according to whom an enquiry is a process during which the problem being investigated only fully appears at the end:

> There is not at first a situation and a problem, much less just a problem and no situation. There is a troubled, perplexed, trying situation, where the difficulty is, as it were, spread throughout the entire situation, infecting it as a whole. If we knew just what the difficulty was and where it lay, the job of reflection would be much easier than it is… In fact, we know what the problem exactly is simultaneously with finding a way out and getting it resolved. (Stark 2009: 2, cited in Tironi 2019)

This conception of repair as enquiry shows that repair is instrumental in creating the breakdown: in many cases, the final outcome of a repair is the discovery of what was broken or damaged.

It also frequently occurs that a repair is the opportunity for discovering an underlying issue that would not have been discovered otherwise: quite often, cyclists who go to a shop for a puncture repair are told that other components of their cycle are damaged. A frequent occurrence is faulty brakes that cannot be adjusted because the wheel is wobbly and needs truing. Broken axles, worn pads, buckled wheels, rusty cables, ill-adjusted bearings, and non-tightened bottom brackets are all mechanical issues that may escape a cyclist's attention until they try to repair their cycle, or until a professional mechanic points them out:

> *"I wanted to tighten my back brake that was a bit soft, it turned out that the calliper was broken"*[38]

[38] « Je voulais resserrer mon frein arrière un peu mou, il s'est avéré que l'étrier était cassé »

As stated by Tironi, breakdowns that have not yet been identified or repaired exist in a different state, in which their consequences are different:

> Our aim is to highlight the different ways these breakdowns exist, and, in this case, their state of latency, or state of plasma, to use one of Bruno Latour's concepts (2005). Breakdowns are not only present when they are identified or repaired, they are also present in an intermediary state in which they are not totally visible and understandable and, therefore, their effects are not the same. Latour defines the plasma state as what "is not yet formatted, not yet measured, not yet socialized, not yet engaged in metrological chains, and not yet covered, surveyed, mobilized, or subjectified (Latour 2005: 244). (Tironi 2019: 196)

Thus, before being identified, a cycle breakdown already exists, but does not have the same effect on cycling practices. The cyclist rides differently before and after they become aware of a breakdown. The diagnosis, which is part of the repair process, is what causes the breakdown to exist as an identified, delimited issue that can possibly be acted upon. A breakdown is thus created by its repair, just as a repair is made necessary by a breakdown.

As discussed above, the degradation of cycles is an ongoing process that is embedded into cycling practices. This blurriness of breakdown echoes the blurriness of repair. Such blurriness also means that the link between breakdown and repair is itself not always well delimited.

As this example shows, the story is rarely "My cycle broke down and I repaired it". It may appear this way to cyclists who bring their cycle to a shop and then retrieve it, finding upon collection that everything that they found had brought discomfort to their experience has disappeared. However, this smooth customer experience may cover over the many difficulties that a mechanic had to face in order to perform this repair. In many cases, the link between repair and breakdown is loose: sometimes a cycle is not broken but is repaired (in which case the situation falls into the realm of maintenance), is broken but not repaired, is partially repaired, takes a very

long time to break down or to be repaired, or its repair may highlight new issues, and so on.

This blurriness of the link between breakdown and repair illustrates that the nature of a repair is often defined by the context in which the mechanical issue occurs. Indeed, in some cases, when asked about the last breakdown or mechanical issue that they experienced, cyclists respond by telling me about the most recent repair. In these cases, the repair defines the breakdown.

The context in which cycling practices occur is often what defines a breakdown or a repair. This relational aspect of repair has been highlighted by several ethnographic works on repair, as applied to the specific case of the commercial interaction between mechanics and their customers (Harper 1987; Crawford 2010). As these studies have shown, for professional mechanics, repair is not the application of a technical solution, but rather a negotiation with customers. As cycle repair is often performed by the cyclists themselves, this negotiation does not always happen between repairers and users, but it is often embedded within cycling practices.

This overview of what could be termed repair or breakdown shows that these practices constitute a very important part of the lives of cyclists. Most cyclists have had a recent mechanical issue or ride dysfunctional cycles, something that can be contrasted with the limited importance accorded to cycle maintenance in cycling culture discourse and academic research. Moreover, in this section, I demonstrate that cycle deterioration and repair are two blurry and uncertain processes that are difficult to delimitate and that co-define each other in cyclists' lives. This argument is summarised in Figure 2.4.

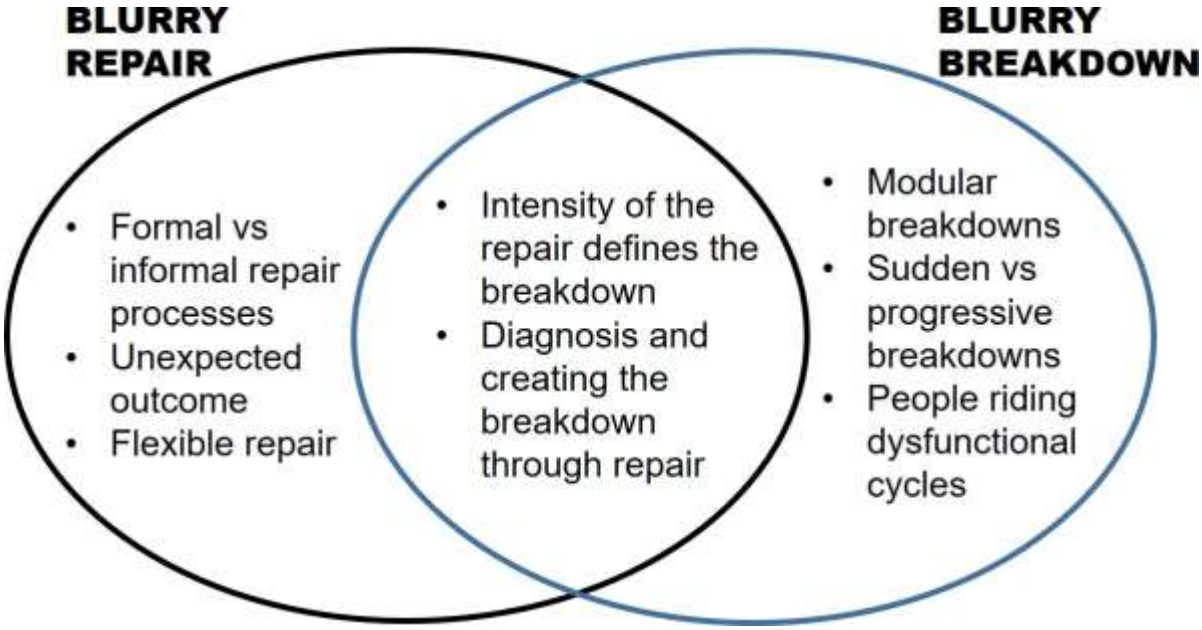


Figure 2.4- Summary of the section: blurry repair and breakdown

2. Inside the Repair Experience

The previous section has focused on repair, breakdown, and the limits thereof. However, repair is also an experience, and even, for some, a craft. In his ethnographic study of the work of a car mechanic, Donald Harper (1987) shows the diversity of skills displayed in repair and maintenance operations, arguing that repair operations must be undertaken with a perfect practical understanding of the materials of which the object is constituted, along with an embedded knowledge of the potential ways in which these materials will react to diverse actions and forces. In this section, I explore the nature of repair skills, along with the general experience of repair. First and foremost, this experience depends on the availability of repair skills and tools. In addition, however, repair practices are also constituted by existing representations, as well as by the complex experiences of professional or amateur mechanics, which tend to encompass both a taste for improvisation and a certain amount of frustration.

2.a. The Availability of Tools and Repair Skills

Due to their simple design and widespread use, cycles are among the most repairable household objects (Whitwham and Trebesses 2016). However, this repairability depends on many factors, including the mastery of repair skills and the availability of tools for repair.

Most people can, by expending a certain amount of time and energy, acquire the skills needed to repair most issues on a cycle. Cycle repair is more accessible than car repair, as the cycle is a smaller object, made of less numerous and expensive components, lighter (and thus easier to lift), and often not motorised. Furthermore, cycling repair equipment is quite affordable, and most repair operations can be executed with basic repair tools (screwdrivers and spanners) or with other affordable tools (cycle pump, tire levers, spoke keys…). However, cycle repair and maintenance are not taught in school at any level, either in France or in Australia. Because of this, an extremely diverse range of cycle repair experiences, skills and practices co-exist among cyclists in both cities. This subsection attempts to provide a more detailed description of these practices by exploring the repair skills of cyclists in Lyon and Melbourne, along with their access to repair tools.

Highly Heterogeneous Repair and Maintenance Skills

The cycle repair survey data confirms this observation of a wide range of repair skills and levels of confidence. In Lyon, as in Melbourne, slightly over a third of cyclists consider that they can easily repair a cycle if given the right tools for it. This is even a strong certainty for 17% of Melburnian cyclists and 22% of Lyon cyclists. On the other side of the spectrum, about 15% of cyclists consider cycle repair to be difficult, with 5% considering it to be very difficult. About half of all cyclists find themselves "in the middle", neither agreeing or disagreeing with the given proposition. Overall, Lyon cyclists seem more at ease with repair than Melbourne cyclists (Figure 2.5).

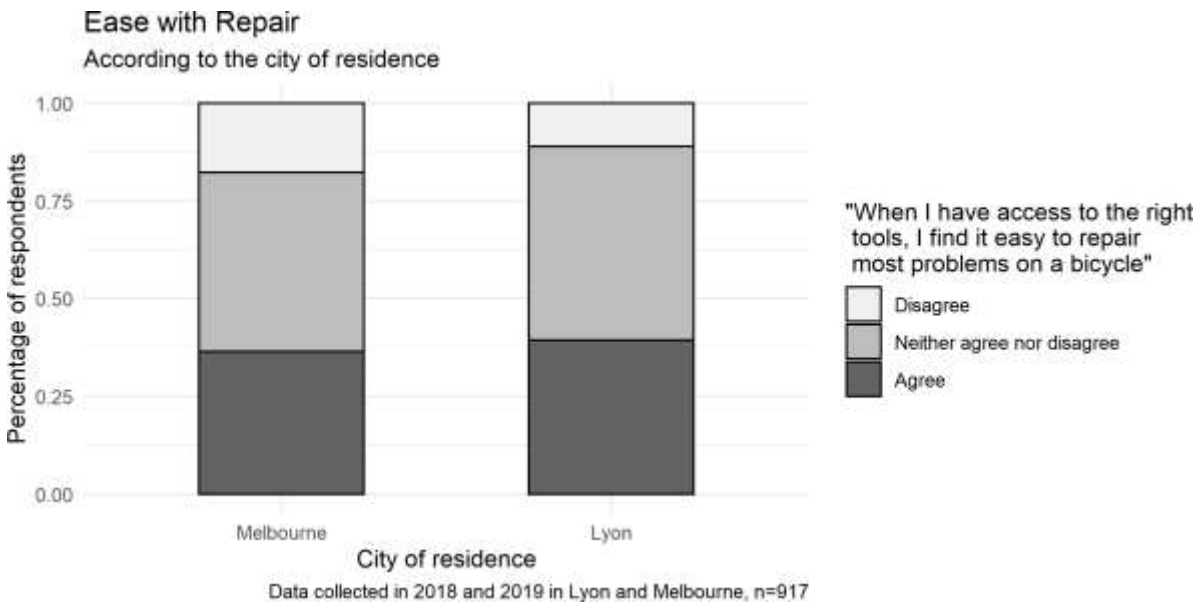


Figure 2.5 - Ease with repair according to city of residence

Ease with repair can be understood in more detail by considering specific repair operations. The best-known repair operation, and the most commonly encountered, is puncture repair. Puncture repair is the first step in learning repair; it is the most frequent repair operation, and workshops that teach basic repair and maintenance typically spend quite a long time on this skill. Despite its ubiquity, however, it is not a trivial operation and is composed of several steps,

which may seem counter-intuitive or require a good amount of delicacy. Puncture repair requires removing the wheel, which may be tricky depending on the braking system installed on the cycle. Tyre levers may damage the tire or the wheel if used without care; a meticulous inspection of the tyre wall and of the rim should be conducted in order to find potential broken glass or a thorn, which may be responsible for the puncture and, if not removed, will cause another puncture soon after the repair. Fitting the tyre back after a puncture repair may also be fiddly, and I have often been present during conversations between mechanics who discussed their preferred tricks and hacks to achieve this outcome without too much difficulty.

Cyclists frequently mention puncture repair as a task that they have performed, struggled with, feared to attempt, or wish to learn. Many people consider that a "real" cyclist is one who can fix a puncture (Aldred 2013a). Meanwhile, mechanics view puncture repair as either a staple – an easy, low-cost operation that takes only a short time to perform – or as a loss leader, a service that does not earn them much money but that attracts customers who may then purchase additional products or request further maintenance operations. Among the survey respondents, 59% reported having mastering puncture repair to the point that they could teach it to someone else, while only 13% stated they had never repaired a puncture. A quarter of all cyclists surveyed said that they were not comfortable with puncture repair. Once again, this illustrates the paradoxical situation of cycle repair, in which many people demonstrate a good mastery of basic skills, while many others do not feel at all confident with the same skill.

A similar situation can be observed with less frequent repair operations: 39% of cyclists feel very confident with brake adjustment, 28% with replacing the chain, 26% with gear adjustment, 13% with wheel truing, and 12% with building a cycle from spare parts (Figure 2.6).

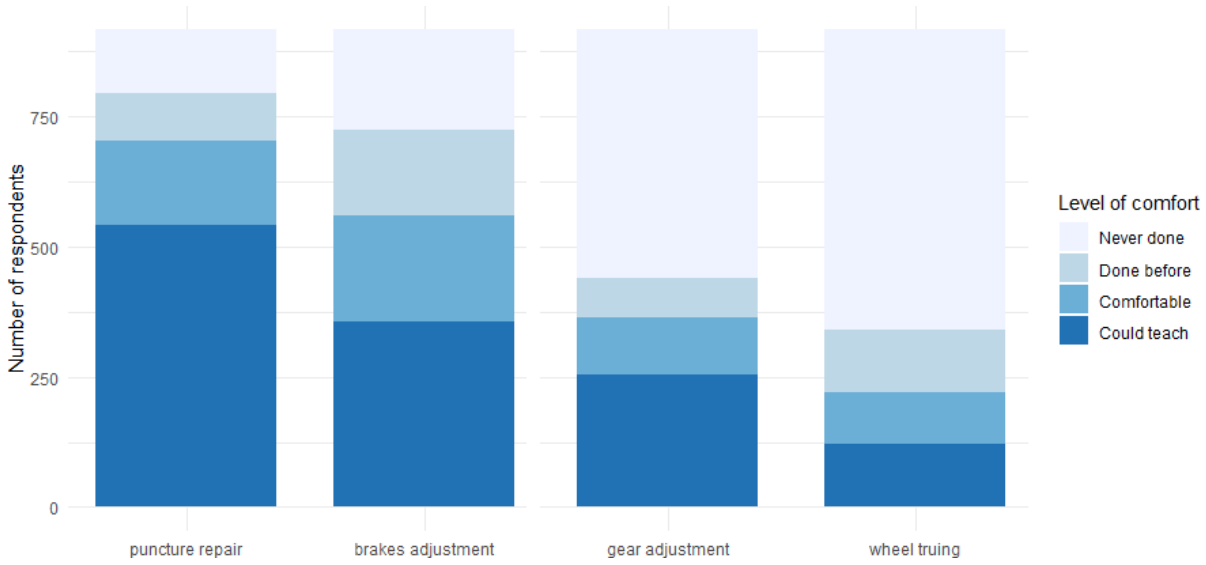


Figure 2.6 - Respondents' ease with specific repair operations

This graph reveals a significant repair skill disparity both between cyclists and for each cyclist individually. It is rare to meet a cyclist who does not know how to do any repairs, or who conversely can perform any repair they require. Most cyclists are comfortable with a certain number of repair operations, but struggle with others. From this disparity of skills ensues a disparity of behaviours in the event of breakdowns: for instance, many cyclists would feel confident repairing a flat tyre themselves, but would go to a cycle shop if faced with any other mechanical issue. In any case, cyclists who can perform most repairs are the exception, although most cyclists possess basic repair skills and can perform several operations when needed.

The Right Tool for the Job

The availability of tools seems to correspond to the mastery of repair skills. For example, most cyclists own, or have easy access to, basic tools that are useful for puncture repair or regular maintenance. More than 99% of all cyclists surveyed had easy access to a pump. Spanners are another commonly owned tool, as they are useful for many non-cycle-related repair operations (Figure 2.7).

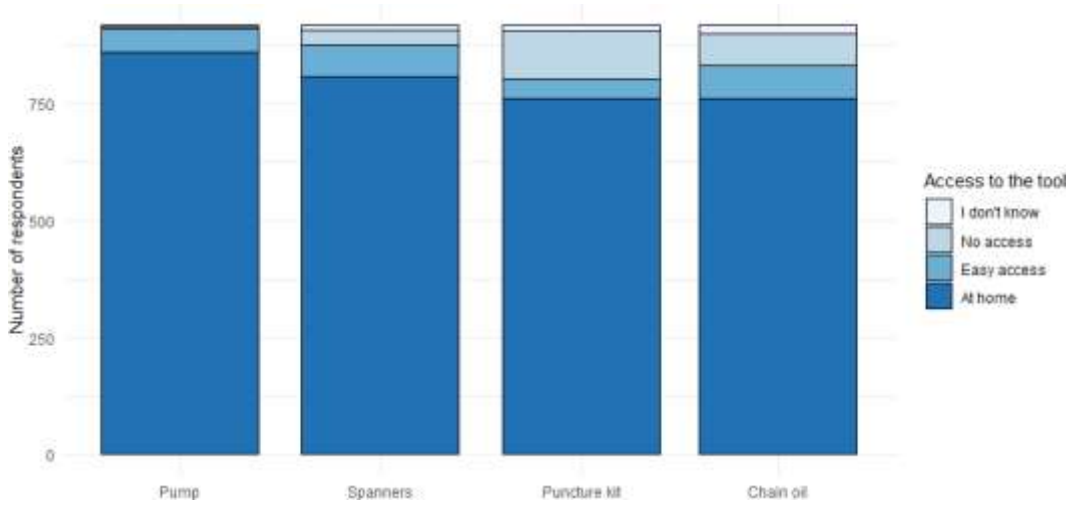


Figure 2.7 - Tool ownership and access (most frequent tools)

Figure 2.8 displays tools that are less frequently owned by cyclists. Some of these are tools that are specific to less frequent operations (e.g., spoke tool).

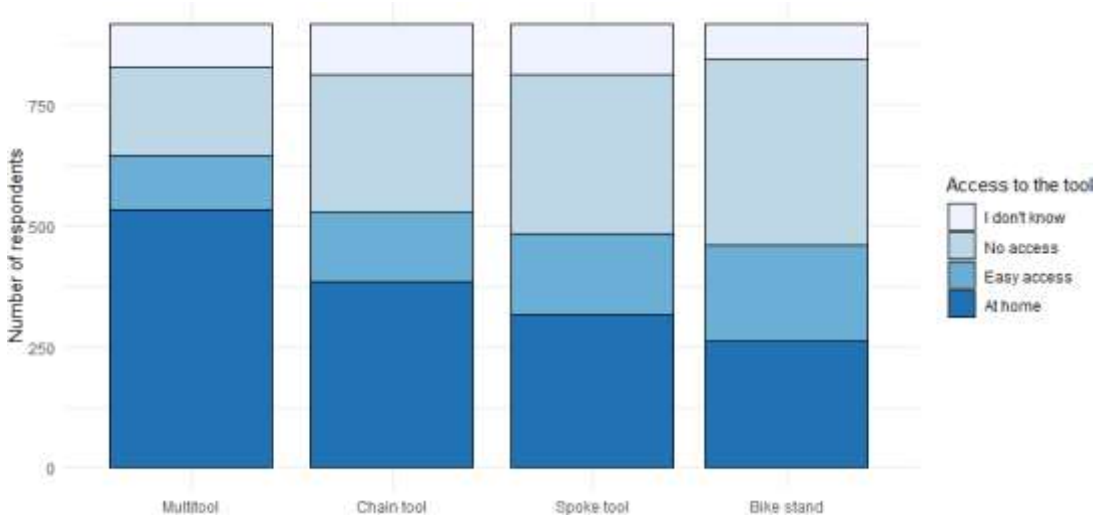


Figure 2.8 - Tool ownership and access (less frequent tools)

The stand occupies a specific place among cycle repair tools: although it is useful for most repair operations, it is almost never indispensable. A bike stand mainly improves the comfort of repair, which is why it is almost always used by professional mechanics, whereas fewer individual

cyclists own one (Figure 2.9). However, some cyclists invest in a stand as part of setting up a routine of maintenance and repair:

> *The other course I attended was about maintenance. Having said that, you know, I've got a bike stand now, so that I can do my chain, I lube my chain and stuff. I find it kind of too hard to do otherwise, [but when it's on the stand] it's quite easy to hook it up there and lube it.*
>
> Julia, cyclist, Melbourne

Although some simple models exist, stands are often a costly tool and occupy quite a lot of space. These two aspects may explain why Melbourne cyclists, who earn more on average and have more available space, are almost three times more likely than Lyon cyclists to own a cycle stand (42% of Melbourne cyclists compared to 14.6% of Lyon cyclists). This difference is the only point on which tool ownership differs strongly between cyclists in both cities.

Figure 2.9 - Home-made solution to keep a cycle still for maintenance and repair

When asked about the tools they own, cyclists describe their acquisitions of tools over time, while learning techniques but also facing mechanical issues with their cycle. One last factor that impacts tool acquisition is the shape and model of the cycle, since different cycles require different tools:

> *The first thing I learnt was adjusting the derailleur myself, and then that goes by, and another thing happens, and so I learnt how to do the cables myself… Now my new bike has disc brakes, so I've learned all about disc brakes and all those sorts of things. When it comes up, I spend the time to do the research, and usually I have to buy one or two tools, and then the next time it's quite easy.*
>
> Stuart, cyclist, Melbourne

Despite this, even cyclists with advanced repair skills rarely own every tool they need. They tend to assess the frequency of certain repair operations and the price of the tools in question before purchase, and may sometimes consider going to a cycle shop for a repair – even if they would have been able to perform it themselves – if they consider that it is not worth purchasing a new tool:

> *I have Allen keys, tyre levers, a set with a spoke tensioner, and a set of tools to loosen the rear sprocket, the cassette, and I've got a tool to hold the rear sprocket while you loosen it… but there are two different systems I use in the rear cassette, and I only have one of them. The one time I needed to do something on the other bike, I brought it to the bike shop, and they loosened it for me.*
>
> Stefan, cyclist, Melbourne

Membership of a community workshop can also be of some help for cyclists who do not want to invest in their own tools, especially in the case of very large and expensive tools. This is for instance the case for Noël, who has no interest in purchasing a truing bench:

> *I learned at the workshop where I was before, more or less, well, when I went to this*

new workshop, I didn't need more skills. It was more about tools. They have what I need to true wheels, do it correctly, do it quietly on a device that is made for this.[39]

Noël, cyclist, Lyon

Even professional mechanics, who have usually invested in a huge range of tools, often lack the specific tools required to repair specific types of cycles. Indeed, many cycle shops specialise in the repair of certain types of cycles, which informs the stock of tools that they own:

I bought tools here and there, I got them second-hand from old workshops, or from the people who trained me. The chick who rides her old Dutch bike, her Mercier, well, that's it. I learned, really, to work on those bikes. And in exchange, if tomorrow you bring me a €15,000 Pinarello with an electric D2 groupset, well, first of all, it'll be a pain in the arse for me, and also I'm not well-equipped to do it correctly.[40]

Val, owner and mechanic, Lyon

These choices regarding the type of tools used are made even more difficult for mobile mechanics, who have limited space, as they carry their tools with them:

Bikes can only carry a given weight and volume, so it's a matter of thinking smart. When you have three sets of Allen keys, because these ones can be held differently from those ones… no. You only take one.[41]

Rémi, mobile mechanic, Lyon

---

[39] « J'ai appris à l'atelier où j'étais avant, grosso modo enfin, quand je suis allé à ce nouvel atelier j'avais pas besoin de plus de compétences. C'est plus de l'outillage. Ils ont ce qu'il faut pour dévoiler des roues, faire ça proprement, faire ça tranquillement sur un truc qui est fait pour. »

[40] « J'ai racheté d'occase des outils à droite à gauche à des vieux ateliers ou à ces gens qui m'ont formé. La nana qui est sur son vieux col de cygne, son Mercier ou son truc, bah, voilà. J'ai appris, vraiment, à travailler sur ces vélos-là. Et en contrepartie si demain tu m'amènes un Pinarello à 15000 balles avec un groupe D2 électrique bah d'une ça va me faire chier et de deux je suis pas équipé pour le faire bien donc voilà. »

[41] « Les vélos ne peuvent emporter qu'un poids et un volume donné, donc il s'agit de réfléchir intelligemment. Quand tu as trois jeux de clés Allen différents parce que celles-ci elles permettent d'être tenues différemment de celles-là… non. Tu en prends une. »

Repairers thus do not wish to own the greatest number of tools, but rather to own the ones that will most likely be needed– something that requires a knowledge of the most frequent operations, as well as a guess regarding which cycle parts will need servicing in the future:

> *There are many different cassette tools, and if I get lots of repairs in that I can't repair, then I'll find the tool. And one time I got a tool, it was from Germany, I couldn't find it in Australia, but I went online on eBay and found someone who had that tool, for $20 maybe. None of the suppliers had it… So I'll definitely invest in things like that. Because you might not get your money back straight away, but you've always got that, a five-minute job comes in, and it turns into a two-hour job if you don't have the tool.*
>
> Charlie, owner and mechanic, Melbourne

To conclude, the availability of tools is less of an issue than the ability to identify which tools will be needed – something that may heavily depend on the model of the cycle in question, on the skills of the repairer, and on the way they are planning to engage with their cycle (or other similar cycles) in the future.

This initial overview of cycle repair skills and tool availability must be understood in light of the fact that they are closely intertwined. Studies of repair as an embodied practice have facilitated an understanding of how tools and skills are incorporated in the course of manual practice. Dant's study of car mechanics provides interesting insights into the relation between repairers and tools (2005). Dant shows that tools are perceived differently by someone who is skilled enough to use them confidently than by someone who has never or rarely used them. However, when it comes to cycle repair, which can be achieved by cyclists with very heterogeneous skills, this incorporation of tools, combined with the knowledge and experience of the repairer, may vary. The next subsection focuses on two ways in which the gesture of repair may be questioned or become problematic: the case of frustrating repair, and the example of improvisations.

2.b. Struggles and Joys of Repair in Practice

Knowing the type of repairs that most cyclists can or cannot perform is an important step in the understanding of repair practices. However, it does not by itself enable a full grasp of what repairing is, or the way it is experienced in the flesh by cyclists, workshop volunteers, and professional mechanics. Repair is an embodied experience, which implies a significant amount of sensorial knowledge and emotional involvement (Dant 2010; Denis and Pontille 2015). This subsection explores the emotions and frequent issues experienced in the course of repair, more specifically two aspects of this experience: the frustration of repair, and the improvisation that takes place within it.

Frustrating Repair

I previously discussed the idea of repair as a smooth and planned process, and how this idea is constantly called into question by actual and practical experiences of repair. Repair can be a very difficult activity, the results of which are difficult to ignore: the cycle either works or does not work, and the only reward is that things return (or at least appear to return) to the way they were before. Sometimes, and even often when it comes to cycle repair, "the intentionality of the object does not match the intentionality that forms a routine sequence of actions" (Dant 2005: 122).

In these cases, stress and frustration are commonly experienced during repair, especially among amateur mechanics who are not yet confident with their skills and often underestimate the time it will take them to perform a repair. Overall, the lexical field of frustration is overwhelmingly present in the discussions that I had in the course of this fieldwork. This frustration also appears in situations involving complex and fiddly repairs, where the cyclist must repeat a repair process several times before it is completed:

> *Now I know a little bit more, so he said, "ok, let's go, take it apart", so I sat in a corner and dismantled the part. Then I said "uh, I'll need help with putting it back together!" [laughs], so he helped me: "Now do the second one!". I compare, I fiddle. I fit it*

backwards – the brake pads were in the wrong direction. He comes back, he says, "what a mess you've made", so we take it apart again, and we start once more from scratch… And since my wheel was quite buckled, I had fitted the brakes correctly, but it kept rubbing the rim, and then they said, "we have a hack for this: you remove two washers, and it'll keep it away from the rim". So I took it apart again, I removed the two washers… But I think that's how you learn. I spent three hours there, but the music was good, and that's important![42]

Marlène, cyclist, Lyon

Inexperienced repairers may struggle greatly with an operation, because they are engaged in a learning process that includes a lot of trial and error. As described above, it is common for one repair to create the need for another, especially for the least experienced repairers. I myself have replaced several components of my own cycle, hoping that it would solve a mechanical issue, before realising that some unrelated minor adjustment would have sufficed to make the cycle functional again.

Inexperienced repairers can also lack the familiarity that would help them understand that a particular breakdown would be too much hassle to repair, and that replacing rather than repairing an affordable or widely available component would save them many hours of struggle. Paradoxically, this is why skills or experience in repair may thus result in non-repair. For instance, a Melbourne cycle shop selling second-hand cycles decided to always replace wheels before selling them:

---

[42] « Maintenant je connais un peu mieux donc il m'a dit "bon bah vas-y démonte", donc j'ai démonté dans mon coin. Après j'ai dit "euh maintenant il faudrait m'aider à les remonter !" [rit], voilà, il m'aide à remonter, "vas-y fais le deuxième", je compare, je tâtonne. Je l'ai mis à l'envers, les patins ils étaient pas dans le bon sens. Il revient il me dit "mais t'as fait n'importe quoi", donc on re-démonte, on recommence… Et comme ma roue elle était hyper voilée, j'avais mis mes freins dans le bon sens mais ça frottait quand-même et là ils m'ont dit "astuce, t'enlèves deux rondelles et il sera plus loin", donc j'ai re-démonté, j'ai enlevé les petites rondelles en trop… Mais je pense que c'est comme ça qu'on apprend. J'y ai passé trois heures mais il y a de la bonne musique, et ça c'est important ! »

When we first started, we were reusing old wheels. The problem with that is, old wheels, for a start, have more problems than new wheels. Maybe not much more, many more, but they do. And we were recycling those wheels, because people will use them and save the environment, but when these wheels have a problem, people don't ride their bikes, they take their cars. So in the end, that actually makes more sense. It costs us more money, but we just charge a little bit more for it. And then you get people whose bikes are reliable and who ride them consistently and it, for us, it's less work, so we don't have to, you know, struggle too much to be focused with these things which takes us time from servicing other people's bikes.

Michael, shop owner and mechanic, Melbourne

Professional mechanics thus sometimes choose to replace rather than repair. Similarly, cyclists often consider repair or maintenance to be a hassle that they would rather avoid. This may lead to a choice to purchase cycles that are designed in a way that requires less maintenance (for instance, cycles equipped with internal gear hubs).

Furthermore, unlike professional mechanics, cyclists may not be able to correctly evaluate the time it will take to complete a repair that they have never performed before. Community workshop volunteers are well aware of this, and are used to warning cyclists that a particular repair may take longer than they expect; indeed, they then need to negotiate with the closing time of the workshop, as well as the attempt to not clog workshop space with cycles waiting for repair:

There's always a couple people who arrive fifteen minutes before we close: "I have to true a wheel". We tell them, "well, that's gonna be a little bit difficult".[43]

Lucie, community workshop volunteer, Lyon

[43] « Il y en a toujours deux ou trois qui arrivent quinze minutes avant la fermeture, "il faudrait que je dévoile une roue", on leur dit "ça va être un peu compliqué quoi." »

I have found myself in this situation several times – a few minutes before closing time, with a cycle that did not seem anywhere close to repaired, despite my having spent hours working on it. This difficulty associated with repair is widely shared between and joked about on the internet by cyclists and professional mechanics alike:

> *They were a particular sort of disc brakes, I wasn't sure on how to fix them, so I went online and I put in the model number, and then there were a couple of videos, one seemed good, it was like two minutes long – so you know, I thought, "that would be good". So I clicked on it, and there was a guy saying "this is the only way to deal with these brakes", and he had a hammer, and he just whacked them – that was a joke, you know.*

Dave, mechanic and owner, Melbourne

Experienced repairers may also experience these frustrations, since they may arise from not only a lack of skills, but also a lack of equipment, or simply unlucky circumstances:

> *You set the bike on the stand, sometimes you see the breakdown directly, you go "bip bip", just like this, you're almost ashamed when the customer asks you how much they owe – you want to answer, "nothing, it's too easy!". And then other stupid stuff, you spend hours on it. I remember once I was struggling to replace a wheel axle, I didn't have exactly the right axle, I wanted to fit the cone nuts back on, but I didn't have the right ones, and I only got it done at 10:30pm! And it was just a fucking axle replacement! It was nothing!*[44]

Rémi, mobile mechanic, Lyon

[44] « Tu poses le vélo sur le pied, des fois la panne tu la vois direct, tu fais bip bip, sur le coup presque, tu as honte quand la personne te demande "combien je vous dois", tu as envie de répondre "mais rien, c'est trop facile !". Et puis d'autres trucs à la con, tu y passes des heures. Je me souviens que j'ai galéré sur un changement d'axe de moyeu, j'avais pas tout à fait le bon moyeu, j'ai voulu repasser les cônes, c'était pas les bons cônes, et je m'en suis sorti à 10h30 du soir ! Alors que c'était un putain de changement de moyeu quoi ! C'était rien !"

Some repairers often struggle with one specific thing that they know will always be a problem for them. For instance, Rémi often faces a similar issue related to tightening wheel axles, a task he often struggles with; he admits that, in many cases, he is not satisfied with the repairs he performs in these situations. Other mechanics are even more frustrated with repair, with one of them admitting that he considers all repairs to be tiresome and does not find much pleasure in performing any of them. However, he considers some cycles more unpleasant to repair than others, even describing some as "nightmarish":

> *I'll be frank, there isn't a single thing that I enjoy repairing. Honestly, today, I won't tell you that I like fixing bikes, it's just that some piss me off less than others, that's it. But it comes from the design of the bike. You've got bikes that are well designed, that are pleasant to work on, and others that can be a nightmare sometimes.*[45]
>
> Val, owner and mechanic, Lyon

The frustration experienced by repairers differs, in a way that depends on the motives of the repair. Similarly to the ways in which cyclists may cycle for leisure, transportation, or sport, and have differing (and even sometimes conflicting) approaches to cycling (Cox 2005), repairers may have different motives for engaging in repair. Repair practices may be performed in the frame of their professional activity, as a way to resume their usual cycling activity, or in the context of experimenting and learning about repair. Cyclists who repair their own cycles may feel frustrated when a repair process turns out to be longer and more complicated than expected, because any delay has consequences for their cycling practices or may require them to spend more money. Professional mechanics experience frustration differently, since it may challenge their professional self-worth and reputation (Orr 1996), as well as, in some cases, their income or quality of life (as in the case of a difficult task that requires longer hours at work).

---

[45] « Je vais te dire clairement, il n'y a pas un truc que je me fais plaisir à réparer. […] Honnêtement aujourd'hui je vais pas te dire que j'aime réparer des vélos, c'est juste qu'il y a des vélos qui m'emmerdent moins que d'autres à réparer, voilà. Mais ça vient de la manière dont est conçu le vélo. T'as des bons vélos qui sont bien conçus, où c'est agréable à bosser dessus, et t'en as d'autres, des fois c'est un cauchemar quoi. »

People for whom repair is a leisure activity or a learning experience may grow frustrated when a difficult repair seems to call the speed of their learning into question, but they experience frustration to a lesser extent and less frequently than others.

Overall, the stress and frustration generated by repair is often secondary compared with the comfort that a repaired cycle provides to its user. However, frustration is an unavoidable aspect of repair, and a thorough understanding of cycling practices should include this consideration.

Improvising Repair

As the repair process diverges from expectations and repair does not go as anticipated, new forms of repair may arise. Above, I cited the distinction made by Dant between "operative intentionality" (when the gestures of the repairer become instinctive as the different steps of repair are successively achieved) and "intentionality of act" (when the flow of action is interrupted, and the repairer is fully conscious of each decision and movement made). When things do not work as expected, or do not match a pre-existing scheme, repairers shift from operative intentionality to intentionality of act (2005: 122). Under these circumstances, the repairer must return to the diagnosis stage of repair, assess potential courses of action, and sometimes develop unique or unusual solutions. This explains why another central aspect of the lived experience of repair is the significant amount of improvisation that occurs in the course of repair processes.

Improvisation is an important aspect of repair practices more generally (Henke 2000), and has also been found to be essential to cycle repair specifically (Tironi 2019), including in the context of Lyon community workshops (Mené 2019: 66).

Tironi argues that this improvisation derives from the nature of repair as an ambiguous and uncertain practice based on investigation (Tironi 2019). He even suggests that this strong element of improvisation embedded in cycle repair practices makes repair practices a major site for innovation.

However, the taste for improvising goes beyond this community workshop culture: indeed,

even the most experienced repairers sometimes encounter mechanical issues that they have never seen before, or breakdowns requiring a tool that they do not have to hand. In some cases, even with the right tools, mechanics know that they will need to be resourceful in order to perform the operation that they are trying to complete:

> *That bike just there is a reasonably designed bike, but it has particular idiosyncrasies that can lead to a trickier service – maybe not hard, but certainly time-consuming. The cables go inside the frame, it can add maybe fifteen minutes, half an hour to service. Fitting the cables can be very frustrating. I mean, there are some tools available, and there are techniques that you can use as well. And that's a really easy one, there are much weirder ones that come up as well. Yeah, I think what makes a good bike shop, or a good workshop, is just knowing how to manage strange things, idiosyncrasies, as they come up.*
>
> Dan, shop owner and mechanic, Melbourne

Indeed, as detailed above, repair is rarely a linear, step-by-step operation. It is quite common that one step simply will not work or requires efforts that were not anticipated. In this context, many mechanics have developed tricks and hacks that allow them to circumnavigate a specific difficulty or the lack of a certain tool or component, as Dave did when he found he was missing a spoke of an unusual size:

> *Sometimes you haven't got the right part, it's not that hard. I had one yesterday that had special spokes of a special length. I didn't have the right one, but it wasn't that hard to cut one of my ones and put it in there, and I said to the customer, "that spoke is actually slightly different than all the rest" and he said, "I couldn't care less"! [laughs]. I say, "well, you got a different one here". So, I think people have been to the bike shop and [hear], "it's going to cost me $300 to repair it", then I say, "I could do it for 30", you know. Because you can wait for 6 months for the part to come from Mavic, you know [laughs], they're good wheels, or I can put in a spoke that's just as good. It's a different colour, but oh well.*

Dave, owner and mechanic, Melbourne

Dave considers his use of improvisation to be a way of saving his customers time and money. Cyclists are also accustomed to small workarounds to compensate for the lack of certain tools: some use fork handles rather than tyre levers, while others replace more sophisticated tools with simply a large piece of timber and a hammer. One mechanic even told me of a workshop volunteer who, rather than using the heavy specialised equipment often employed for the purposes of truing (a spoke key and a truing bench), could achieve the same effect by jumping on the wheel. One very widespread hack known in all workshops is to use an old cycle tube from a dismantled cycle frame as a massive lever that can fit around a spanner or another key and thereby increase the strength of the tool. Similarly, a few techniques and "hacks" are common shared knowledge between mechanics.

Another context in which improvisation can be required is that of unexpected breakdowns occurring at times when tools are not available. For example, this is often the case during long cycle journeys, and several cyclist respondents related stories of improvising repairs in such circumstances. For example, Tom told me about the day he fixed his luggage rack with tent pegs during a long trip across all of Europe (Figure 2.10):

> *Where the panniers join the frame, one of the bolts snapped and sheared off inside. It was somewhere in Albania. Look at this picture – usually there's a steel bolt screwing the pannier into the frame, but here that's three cable ties. And you'd think that would snap instantly. 'Cos there's a lot of weight! But it didn't. It was almost lucky that, where it snapped, there was a little gap, so I could actually get a peg in there, so it could hold it.*

Tom, cyclist, Melbourne

Figure 2.10 – A tent peg and cable ties allowed Tom and his friend to continue their trip across Europe

Notably, however, improvisation does not only happen in exceptional situations; to the contrary, it is embedded in the daily life of many people who are involved, one way or another, in cycle repair. For instance, one mechanic considers that his use of improvisation is essential to the specific repair of older cycles:

> *Yeah, I learned on the spot. I went to school to validate the thing, and… I had good people to help me! I found the elders that I needed. They fixed stuff, I was amazed. They were experienced, had a lot of tools, but also, they used hacks for everything. For everything. That's it, when you fix an old bike, it's good to have old tools, but you know,*

sometimes I go to the bar next door and I get a wine cork to wedge a thing, or some Coca-Cola can. Actually, the guys fresh out of training, well-supervised, who end up in sanitised bike shops, I don't know if they do that sort of thing.[46]

Val, owner and mechanic, Lyon

Integrating improvisation into one's daily life is common among people who repair cycles all day as part of their work. However, some cyclists also adopt this approach, not as a way to make their work easier and faster, but rather to save money or reduce waste. For example, Bill, a retiree and keen cyclist, regularly repairs and updates his cycles using parts he finds on the side of the road while riding:

If one [cycle] is not working perfectly, then I'll just grab the other one and use an alternative. I'll wait until I've thought about a solution. If there's something that I haven't done before… Well, I'll think about it, I'll get some spare parts off an old bike, yeah, I'll try and do it cheaply using second-hand parts, using things that I've already got. Can I swap something from an old bike to another? As I'm riding, if I see a bike that's been thrown away, I'll stop and think, "is that the same as the one I have at home, could I swap something over?".

Bill, cyclist, Melbourne

Bill likes to fit old tyres between his own tyres and the tube in order to increase the puncture protection. He also creates inventive devices with objects he finds in the street: for example, he likes to turn old shopping trolleys into cycle trailers. To him, most objects could potentially

[46] « Ouais je me suis formé sur le tas. Je suis allé à l'école pour valider le truc, et… j'ai surtout été bien entouré quoi ! Je suis tombé sur les anciens qu'il fallait. Ils réparaient des trucs, j'étais halluciné. Ils étaient en mode autant très expérimentés, très outillés, mais aussi du système D pour tout quoi. Pour tout. C'est ça, quand tu répares du vieux vélo, c'est bien d'avoir des vieux outils, mais tu vois des fois je vais au bar à côté chercher un bouchon de liège pour caler un truc, ou de la cannette de coca. C'est vrai que les mecs qui sortent de formation, bien encadrés, qui finissent dans des magasins de vélo bien aseptisés, je sais pas s'ils font ce genre de trucs. »

contribute to the good operation of the many cycles he owns. Bill has developed a series of alternative habits that are based on resourceful tricks: he fits rear-view mirrors onto all his cycles, and has become accustomed to extending his handlebars with some foam in order to reduce the risk of breaking a mirror by leaning a cycle against a wall.

Improvisation does not always involve strange objects and unusual tools; it can also express itself in the way cyclists use their cycles in daily life. For instance, Tom often swaps bike parts between cycles for optimal use. This is the case when it comes to his tandem bike, the wheels of which he suspects are not designed well for holding the weight of two people:

> *As I was saying, many bikes, many parts sort of cost money, and I said I bought a wheel for the back, I haven't actually bought a wheel for the front, so I took the wheel, each time I go out I take the wheel off my commuting bike and use it on the tandem. At least when we've been doing tours. If we're just going down St Kilda on bike, I could use the wheels that were in there.*
>
> Tom, cyclist, Melbourne

Like Tom, several cyclists I met had to develop their own solutions in order to repair a non-standard cycle: cargo cycles, tandems, recumbent cycles, and other more unusual types of cycles have their own unique issues that standardised tools and solutions are not always fit to address. For instance, Xavier, who owns an electric "long tail"[47] cargo cycle, found that it was possible to form a long chain of the kind used in tandems by assembling two separate cycle chains. He also realised that the legislation restricting the power of the battery of electric cycles to 250 watts did not fit with the weight of a cargo cycle, and decided to change the motor:

> *The only other custom bike I've seen like mine is the guy at the cargo bikes store. [...] And I said, "yours is a 500 watts, I bet it is", and he goes, "yeah it is, how did you know?".*

[47] Long tail" cycles are cycles with an oversize luggage rack, which allows the rider to carry several children or large and heavy equipment.

> *I said, "because I've got the same thing, and I know 250 doesn't move it very well" [laughs]. And I don't know who made it that 250 watts is the mandatory, because the moment you load up the cargo bike and try and ride it up the hill, a 250 watt motor just cannot push out the power that you need to get up.*
>
> Xavier, cyclist, Melbourne

Overall, whether it is to adapt to a temporary lack of access to tools or components, to save money, to adapt to a specific situation, or just for fun, amateur and professional mechanics alike are quick to veer off the beaten path, following the main objective of a cycle that works smoothly at the end.

A thorough consideration of these two aspects of the repair experience – improvisation and frustration – show that repair experiences go beyond repair skills. Repair is not simply a list of steps to follow, but is instead often experienced as a series of investigations, some of which are unexpected, or require unavailable resources or skills, and must therefore be successively overcome with patience and creativity.

3. Sharing Repair

Having introduced the definition of repair practices and some key elements of such experiences, I now wish to focus on another important modality of repair: its distribution. The first way in which repair is shared is across time; accordingly, this section first explores the repair/maintenance dichotomy as a way in which repair is shared over time. The second way in which this distribution of repair can be approached is through the different actors of repair and the share of repair that they each have: this is the object of the second subsection, which focuses on the share of repair responsibility.

3.a. Repairing versus Maintaining[48]

Repair and maintenance are two practices that derive from a desire to return a cycle to its initial condition. However, repair occurs after a breakdown, whereas maintenance occurs continuously, even in the absence of any obvious malfunction; maintenance can thus be termed "repair-before-failure", which aims to prevent "repair-after-failure" (Jacobs and Cairns 2011). This difference is nonetheless subtle and sometimes questionable. Indeed, I discussed the ambiguous nature of the definition of "breakdown" earlier in this chapter.

The difference between repair and maintenance remains relevant, as it characterises two distinct attitudes regarding the condition of a cycle: repairing (namely, not caring about the object's condition until some obvious dysfunction occurs that impedes regular use of the cycle) and maintaining (namely, conducting frequent checks of the object's condition in order to prevent any discontinuity in its use). Unlike an attitude focusing on repair, an attitude focusing on maintenance tends to try and anticipate wear and breakdown in order to prevent it. Denis and Pontille argue that maintenance is a practice that requires a specific mindset, a constant attention to the vulnerability of things (Denis and Pontille 2020b). According to them,

[48] Part of this section of the thesis was developed following a presentation on the theme of cycle maintenance at the Vmob seminar in May 2021, the title of which was "Mécanique cycle et responsabilité des cyclistes".

"maintenance takes effect when people develop the capacity to perceive differences within a system of objects that may appear stable at first glance" (Pontille and Denis 2010).

This specific attention can be activated at many levels: for instance, some cyclists conduct frequent checks, cleaning and replacing certain parts at a certain frequency so that they will not break, or adapting the way they ride and park their cycle in order to better preserve its condition.

The Repair-to-Maintenance Continuum

Data from the cycle repair survey provides some interesting insights into the practices and representations of maintenance among cyclists in Lyon and Melbourne. Overall, 88% of Melbourne cyclists and 78% of Lyon cyclists state that it is important or very important to them to maintain their cycles regularly. This declaration seems to match actual practices, since a similar proportion of cyclists report oiling their chain regularly (oiling the chain is one of the most emblematic, and simplest, cycle maintenance activities that can be undertaken). Indeed, 69.2% of cyclists consulted for the survey stated that they regularly oiled their chain; once again, this share is higher in Melbourne (74%) than in Lyon (64%).

However, this overall high level of interest in maintenance conceals a wide diversity of attitudes regarding maintenance among cyclists. The cycling repair survey highlights that some factors are positively correlated with the importance given to maintenance, in particular the length of cycle ownership. Cyclists who have owned their cycle for longer pay more attention to maintenance practices, as do cyclists who ride more frequently. Overall, interest in maintenance seems to be something that increases with time and cycling experience; however, it is also possible that holding maintenance in high esteem contributes to a lasting and intensive cycling experience. Repair and maintenance are tightly intertwined: the more at ease cyclists feel with repair, the more they consider maintenance to be an important issue (Figure 2.11).

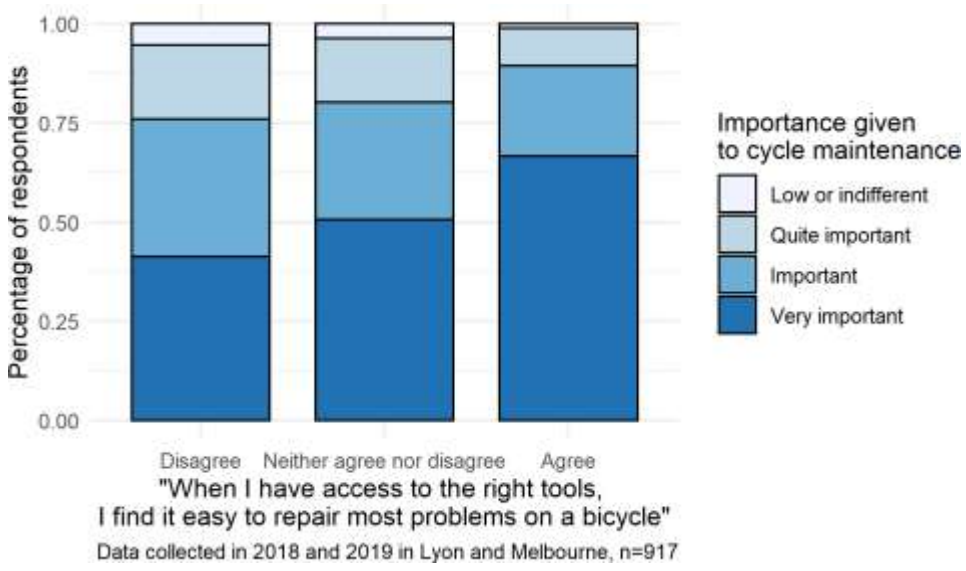


Figure 2.11 - Representations of maintenance according to ease with repair

Although maintenance and repair are two distinct practices associated with very different mindsets, they cover extremely similar technical operations and are often performed by the same people (primarily cyclists, community workshop volunteers, and professional mechanics). Furthermore, it also appears that maintenance is the next stage of repair: in short, people who acquire repair skills increasingly shift towards a "maintenance mindset", as learning how to repair a cycle part supports an understanding of how it works, and accordingly, an understanding of ways to diagnose early wear and how wear might occur over time[49].

Besides these factors related to cycling experience, other factors are correlated with an interest in maintenance. For example, riding a cycle that was purchased new rather than second-hand seems to be associated with a higher level of interest in maintenance. Another aspect of cycling practices that is correlated with maintenance is the use of a cycle in good condition. Overall,

[49] The issue of the transformation of the cycle–cyclist relationship as it relates to learning repair is addressed further in this thesis, as it was adapted from a book chapter on this topic (Abord de Chatillon 2022)

the causality underlying these trends may be dual: cyclists who spent more money on their cycles or own a cycle in better condition tend to worry more about them and are more likely to engage in regular maintenance, while cyclists who care more about their cycles may also care more about preserving their good condition or be more willing to purchase a new cycle. Finally, cyclists who use their cycles for sports and leisure tend to be more preoccupied with maintenance than commuters.

Cyclists and mechanics possess diverse attitudes regarding maintenance. The first trend observed during my fieldwork among mechanics is a general disappointment regarding the neglect that they feel many cyclists show towards their cycle.

Mechanics and Maintenance Neglect

Despite the figures presented above indicating that most cyclists care about cycle maintenance, many mechanics interviewed for this research related stories of customers who did not understand why maintenance was important. Despite being a minority, these cyclists are still numerous enough to be a significant issue in the professional lives of these mechanics:

> *Sometimes people do not understand mechanical objects, they look at it like a form of magic. And the people who look at it like a form of magic, they get a machine, and they treat it like a sculpture. It does its thing, and you shouldn't really have to fix it.*
>
> Michael, mechanic and owner, Melbourne

Due to this lack of interest in maintenance, many mechanics stated that they frequently encountered cycles in very poor condition. Although this could be considered good news for a business based around repair, this is generally not the way mechanics see it; indeed, many are repelled by the idea of a poorly maintained cycle. This is for instance the case for Renaud:

> *For me a scary bike is a bike that is ill-maintained. You hear it, you see it come in, everything is noisy… well, you feel that it's not safe to ride. You try and fix the front wheel*

but the whole back of the bike will screw up. They're surprise bikes.[50]

Renaud, mechanic, Lyon

This feeling of frustration can, as in the case of Renaud, be driven by the idea that work is made more difficult by a neglected cycle. Indeed, in some cases, a certain number of components in bad condition indicates that any part of the cycle could be broken, something that can make the work of repair far more complex. However, in some cases, mechanics worry not only about the amount of work they will need to perform, but also about the safety of their customers:

> *The bike from this morning… The brake cable hadn't been replaced in years, and actually, water had got into the housing, it'd gotten rusty and the cable couldn't brake anymore, it couldn't move. And so it didn't work, and she didn't have any brake pads at the front, either. And the wheel axle was broken, so the wheel wasn't supported by anything anymore. So we booked an appointment for later. Until then, I lubed her brake cables and I adjusted [them] so it'd be tighter, and I told her it was dangerous for her to ride now, and that it wasn't my responsibility.*[51]

Karine, mechanic, Melbourne

Another reason for this feeling of frustration experienced by mechanics is their concern when observing that some cycles are used in a way that accelerates their decay and increases repair costs for the cyclist. Indeed, mechanics are aware that certain simple operations (for instance, replacing brake pads) can prevent more serious damage to more expensive components of the

---

[50] « Pour moi un vélo qui fait peur, c'est un vélo qui est mal entretenu. Tu l'entends, tu le vois arriver, il fait du bruit de partout… tu sens que c'est pas serein de monter dessus quoi. Tu veux réparer la roue avant mais c'est tout l'arrière qui va déconner. C'est des vélos surprise. »

[51] « Le vélo de ce matin… Le câble de frein n'avait pas été remplacé depuis des années et en fait du coup l'eau était rentrée dans la gaine, et ça avait rouillé et le câble ne pouvait plus freiner, il ne bougeait plus. Et donc du coup, ça ne marchait pas, et en fait elle avait plus de patins de freins à l'avant non plus. Et l'axe qui est dans la roue était cassé et du coup la roue elle n'était plus soutenue par quelque chose, quoi. Alors on a pris un rendez-vous pour plus tard. En attendant j'ai mis du lubrifiant dans ses câbles de freins et j'ai ajusté pour que ce soit plus serré et je lui ai dit que c'était dangereux pour elle de rouler là à vélo et que c'était, moi c'était pas ma responsabilité. »

cycle, thus representing an easy way to delay the undertaking of larger-scale maintenance or repair. The feeling of waste that they experience may be exacerbated in the case of expensive or high-quality cycles:

> *When you look at the condition of bikes parked in the street, you see that there's a real lack of investment in maintenance! I can't believe the number of luggage racks [I see] tied to the bike with a string. For instance, in the case of an e-bike, the person's bought a bike that's much more expensive. Despite this, I've seen a lot of them where the brake… I don't know if you know what a disc brake pad looks like, there's a metal plate and a friction block that deteriorates and thins out over use time. When the block is fully gone, well, you brake with the metal, which first of all doesn't work, and second of all deteriorates everything. I've seen so many of those.*[52]
>
> Eric, mechanic, Lyon

In many cases, this neglect is fed by a lack of precise knowledge of the workings of a cycle. Cyclists who do not have a "maintenance mindset" and go to a cycle shop are often surprised or shocked by the operations they are told are necessary. This sometimes leads them to express anger regarding repair prices, which they deem too expensive given that, in their opinion, nothing is "broken":

> *When I tell them that fixing a chain, a cassette, brake cables, brake pads, costs about $250, people tell me "well, no, $250 is too much", and it's true that they are not ready to spend this much money. And so it's quite rare to have a customer – I got one today, but it had maybe been a week since the last one – who says, "do whatever is necessary".*

---

[52] « Quand tu regardes l'état des vélos garés dans la rue, tu vois qu'il y a un sous-investissement dans la maintenance quoi ! C'est fou de voir le nombre de porte-bagages qui tiennent avec des bouts de ficelle [rires]. Par exemple avec le VAE, la personne a acheté un vélo qui est nettement plus cher à l'achat. Et pourtant j'en ai vu un paquet qui freinent… je sais pas si tu vois ce que c'est une plaquette de freins, c'est du métal avec une garniture, et puis quand il n'y a plus de garniture bah tu freines avec le métal, ce qui déjà d'une ne freine pas et puis de deux, abime tout quoi. J'en ai vu plein des comme ça… »

Karine, mechanic, Melbourne

Mechanics often resent these interactions, since they experience them as a lack of recognition of their work. In some cases, it even interferes with the business interaction that they have with cyclists, who may debate the need for a repair, or even go so far as to blame the mechanics or cycle sellers for the wear of their cycle:

> *To be honest, it's slightly frustrating sometimes, because they come in two years later and say, "my bike hasn't been working at all" – and the tires are flat, the chain is rusty, and you say, "did you leave it outside? Did you ride it very much?" and they're like, "nah, but… I bought it, it should work!". I say, "it's a machine! Upkeep it!". It's a lot of people, yeah. Someone came in here recently and complained about getting a puncture just after they'd had their puncture repaired here, and I said "oh, sorry" and repaired it for free, but then when I asked when they'd last been here they said, "oh, maybe like, January last year". And I was like "well, that's not…"*

Michael, owner and mechanic, Melbourne

This issue, which many mechanics experience, is related to the nature of repair and maintenance as a specialised type of work that unskilled cyclists delegate to a skilled mechanic. This delegation – knowing when cyclists should perform some maintenance themselves and how often they should go to a shop – also requires cyclists to have a certain level of skill. Often, mechanics accept that being specialists may imply the need for some communication work to inform their customers about repair and maintenance basics.

These efforts made by mechanics to convince a customer that their work and fees are worth it appear in the following exchange between Paul (P), owner and mechanic at a cycle shop in the Melbourne suburbs, and a young woman (L), who walked into the shop for a service:

> *L – I booked in for a service.*
>
> *P – Just a service… Okay, let's have a quick look… Any problems? Doing anything*

strange? [He takes a look at the cycle] You're pretty much on for brake pads, tyre, I think a rear brake inner cable will be worthwhile.

L – Yeah, I'm happy to do whatever…

P – Alright, I'll just have a quick look and see. The drivetrain… did you get this bike from new?

L – Yeah.

P – Wow, it's done some miles… the chain is actually pretty worn.

L – Yeah, that's fine.

P – As is the… this will have to be replaced as well. L – Okay.

P – It kind of has to…

L – It's okay, I knew it needed a bit of work [laughs], I expected it.

P – You know, my wife takes the train to Melbourne every day, it's $180 a month.

L – Exactly.

P – Bicycles cost about 4 cents a kilometre. 3 or 4 cents, it's nothing. L – Yeah, it's pretty good. I used to take the train, so…

P – Being realistic, about $195 in parts, and then probably an hour and a bit labour, so it's going to be around 320…

L – That's okay. All good.

P – You know, do that, and off you go again.

L – Yeah, yeah, that's alright. Yeah. That's fine.

P – We can do that. Listen, I'll take care of that for you, we'll do a nice job, and I'll send you a message. I should be able to do it today.

In this exchange, Paul makes a strong argument to justify his prices and the repairs he wants to

undertake on the customer's cycle. The mechanic insists that some components are worn, then compares the price of the repairs to train fares (which would be more expensive) and provides a price "per day" for a better comparison. In his last argument, he insists that this repair will allow the customer to resume riding comfortably and that no other mechanical work will be needed for a while. The efforts Paul makes to convince this cyclist, who fully accepted his diagnosis from the outset, illustrates his experience with having his prices and repairs contested by customers:

> *Some people have a feeling that people are gonna steal from you, or overcharge, especially when you don't understand, you know. So I try to explain to people that the charge is reasonable, and show them what they've got, and give them the parts we took off in a plastic bag. [...] Usually it's enough, but sometimes they've got ten questions about this. "Why? How much? Hm, I've seen them cheaper somewhere else."*
>
> Paul, mechanic and owner, Melbourne

The conflicting situations arising from different conceptions of regular cycle maintenance are typical of the different approaches to repair among people with different levels of expertise. The discussions between mechanics and cyclists aim to align expectations of repair between these actors of repair. Such an operation may be arduous and lengthy, and may not result in a final agreement. In one study of workplace repair, Henke (2000) discussed a frequent conflict resulting from customers thinking that something was broken when technicians did not think this was the case. Henke suggested referring to the arguments employed by technicians under these circumstances as "repairing the customer". As demonstrated above, cycle mechanics also engage in "customer repair", but in reverse: rather than convincing customers that repair is not necessary, they try to convince them that it is in fact required.

The choice to repair a cycle oneself or to bring it to a shop also depends on the resources available to cyclists, as well as the different actors who can contribute to this repair.

3.b. Repair Actors and the Share of Repair

Previous research has illustrated the ways in which repair and maintenance responsibility is often shared between actors and the characteristics of the object itself, as in the case of the shared installation and maintenance of the Zimbabwe bush pump (de Laet and Mol 2000). In the case of cycling, different actors involved in cycling practices share between them the responsibilities of repair and maintenance: cycle designers, sellers, cyclists themselves, professional mechanics, and community workshop volunteers can each contribute to the maintenance or repair of a cycle at different times. The choice to repair a cycle oneself or to hire a professional mechanic feels natural to some cyclists, but not all. This subsection explores the overlap and evolving frontier between actors and the way they share repair operations.

Different Resources and Spaces for Repair

The roles of professional repair and community repair differ in each city. For instance, in Lyon, 21% of cyclists report never having gone to a cycle shop, whereas only 6% of Melburnians are in this situation (Figure 2.12). Sixty-eight per cent of Melbourne cyclists go occasionally or frequently to a cycle shop, whereas only 37% of Lyon cyclists do so (Figure 2.13). Thus, even though cyclists in both cities visit them frequently, cycle shops have a stronger importance for cyclists in Melbourne than in Lyon.

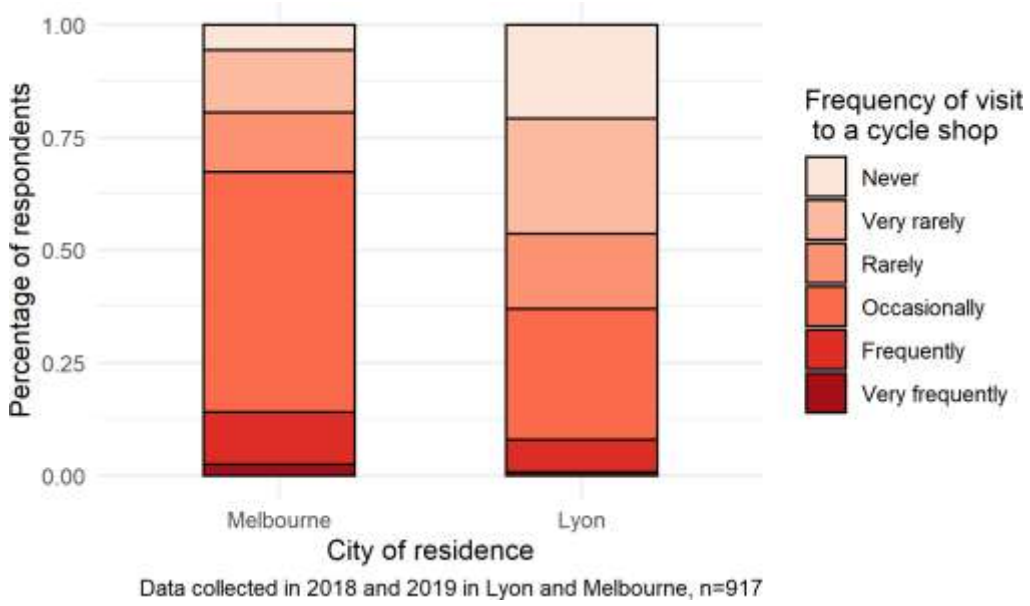


Figure 2.12 - Frequency of visits to a cycle shop in Lyon and Melbourne

Figure 2.13 - Cycles Guédon, a cycle shop in Lyon

Another resource cyclists can seek out when they are in need of repair is self-repair workshops, if any are located in their area (Figure 2.14). These workshops are spaces that aim to empower

cyclists by encouraging them to repair their cycles with the help of volunteers (Bradley 2016; Batterbury and Dant 2019).

Despite the strong academic interest in community and self-repair workshops, they are less widespread, less known, and less used than cycle shops. A minority of cyclists in both cities report visiting them frequently; indeed, 59% of the cyclists surveyed have never been to one. Unlike cycle shops, these workshops are a place used more frequently by Lyon cyclists than Melbourne cyclists (Figure 2.15), echoing the higher number of these workshops in the French city. A third of all cyclists in Lyon (31%) visit these workshops occasionally or more often, whereas this is only the case for 12% of Melbourne cyclists.

In addition to these two spaces of repair, cyclists often ask a friend or relative for help. According to the cycling repair survey, about 70% of cyclists in each city have a friend or relative who could help them if necessary.

The resources mentioned above seem numerous, but many cyclists actually experience a lack of options when faced with a cycle breakdown. Several cyclists mentioned long waiting times to book a service at their repair workshop, or the scarcity of repair spaces in the area where they live. Others hold the places of repair they have found in high esteem, as they are scarce:

> *"There is always some good music, beautiful boys, and above all good advice at the workshop. I don't know anything about it, I don't know anyone who knows stuff about bikes, so this is a life-saving place for me"*[53]

[53] « Il y a toujours de la bonne musique, de beaux garçons et surtout de bons conseils à l'atelier. Je n'y connais rien, n'ai aucune personne de mon entourage qui s'y connaisse en vélo, donc ma seule bouée de secours. »

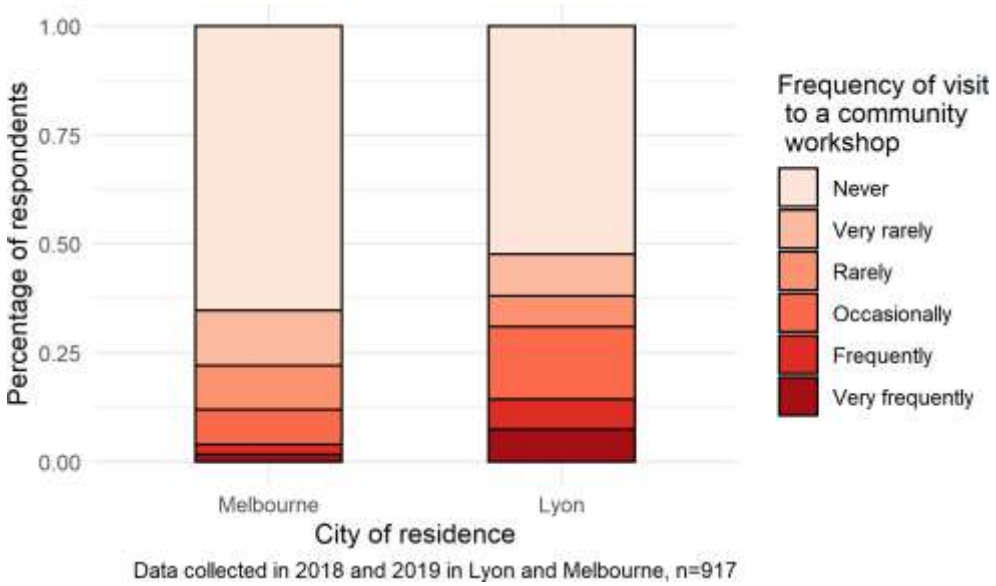


Figure 2.14 - Frequency of visits to community workshops in Lyon and Melbourne

Figure 2.15 - CERES bike shed, a self-repair workshop in Melbourne

This diversity of resources in each city leads to a diversity of practices in the event of a cycle

breakdown[54]. Thus, the cycle repair survey shows that many more Melbourne cyclists (50%) than Lyon cyclists (30%) brought their cycle to a shop or professional mechanic when they last experienced a breakdown. Similarly, Lyon cyclists were more than three times more likely than Melbourne cyclists to take their cycle to a community workshop after their last breakdown (17% of Lyon cyclists versus 4% of Melbourne cyclists did so).

Overall, Lyon cyclists are more likely than Melbourne cyclists to get personally involved in the repair of their cycle. Despite this discrepancy, most cyclists in both cities seem willing to attempt and repair their cycles, with 61% of all survey respondents having contributed to the repair of their cycle when it last broke down.

This choice to repair is however experienced differently for cyclists according to their repair experience and skills.

Delegating Repair and Repair Skills

Some cyclists find a close association between their skills and the times when they decide to repair their cycle themselves. For instance, when asked about their last repair, one cyclist stated: "It was straightforward for them. The stuff I do is straightforward for me."

This attitude is shared by many, and there is a direct positive correlation between self-assessed ease with repair and the personal involvement of cyclists in their own repairs (Figure 2.16).

[54] The share of repair practices between actors is explored further later in this thesis, in the context of income inequalities (chapter IV) and in the frame of gendered repair practices (chapter V).

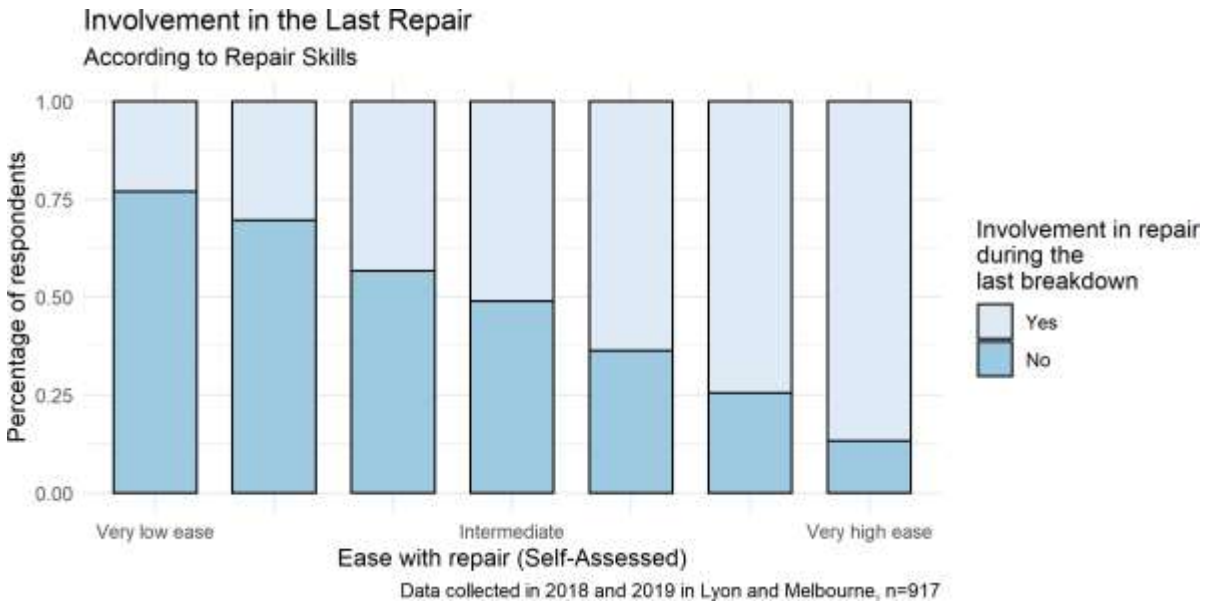


Figure 2.16 – Involvement in the last repair according to repair skills

The testimony of several cyclists illustrates that this choice is made in consideration of their own skills:

> *"Spokes and truing wheels are a little beyond me, otherwise I might have fixed the problem myself."*
>
> *"Complicated repair that had to be performed by professionals."*[55]

However, not all cyclists experience such a clear delimitation between repairs they would like to take charge of themselves and those they would prefer to delegate to someone else. One reason for delegating repairs may be that, as stated above, they may not find any pleasure in performing a repair themselves; this is often because, unlike cyclists who consider repair to be a learning opportunity, these cyclists have an instrumental relationship with repair practices, and prioritise resuming their usual cycling practices. Other reasons for not performing a repair

[55] « Réparation compliquée qui devait être faite par des professionnels. »

despite having the skills to do so include not having the time or tools to do it properly. Reciprocally, cyclists who cannot afford professional repair may feel compelled to do it themselves, despite not being very experienced or skilled at these tasks; this situation is explored further in the fourth chapter of this thesis.

In some cases, as highlighted in the previous discussion of cycle neglect and professional mechanics, being more skilled at repair can contribute to a healthy business interaction when resorting to the service of a professional mechanic. For example, one cyclist reported relying on their repair knowledge to understand or better interrogate the advice they received in cycle shops.

In addition to hiring a professional mechanic, there are other ways in which cyclists share the responsibility of repair and get some help during the cycle repair process.

Getting Help, in Practice

Repair usually does not happen through the will of one repairer alone. One cyclist interviewed told me that after she moved away from her father, who used to help her with most of her repairs, she developed a habit of asking cycle shop employees for help and free advice:

> *I used to call my father on the phone to ask him for some advice on what to purchase. But for repair stuff, there's always a store near you, and you can ask the staff questions, and usually they help you. Sometimes they even do it for you, for free, just like that.*[56]
>
> Chloé, cyclist, Lyon

Although Chloé's habit (performing repairs herself, but with the help of complete strangers whom she does not pay) may seem surprising, it in fact reflects a strong tendency among cyclists: out of the 60% of respondents who contributed to the repair of their own cycle, only

[56] « C'est vrai que j'appelais aussi mon père au téléphone pour lui demander des conseils sur quoi acheter, mais sur des questions de réparation, tu trouves toujours un magasin près de chez toi et tu peux toujours poser des questions aux gens et généralement les gens t'aident. Des fois ils le font même pour toi, gratuitement comme ça. »

half of them (30%) executed the entirety of the repair on their own without any outside help, or only with the help of online tutorials and resources. The other half of these amateur mechanics performed the repair with the help of friends or relatives, a professional mechanic, or a community workshop volunteer. Once again, the picture of repair share is very heterogeneous and complex. Without being the majority of cases, it is quite common for a cyclist to seek for help from different sources at the same time (Table 2.1): Thirty-two cyclists sought help both from friends and relatives and a professional mechanic, while 22 cyclists sought help from community workshop volunteers as well as online videos.

Number of respondents who used this/these sources of help	Help from a professional mechanic	Help from volunteers at community workshop	Help from friends or relatives	Help from internet resources (tutorials, forums…)
Help from a professional mechanic	343	9	32	28
Help from volunteers at a community workshop	/	79	12	16
Help from friends or relatives	/	/	164	22
Help from internet resources (tutorials, forums…)	/	/	/	76

Table 2.1 - Sources of help sought by cyclists for their last repair

This table displays an important crossover between types of help and contributions to a repair.

This crossover may be related to an initial plan of the cyclist, who seeks out certain resources at the time they are the most useful to them:

> *"Diagnosis in my home. Purchase of new part at a local bike shop. Fitting in a self-repair workshop. Small final adjustments in my home after testing it on the way back from the workshop."*[57]

Cyclists sometimes combine several types of resources in the course of one repair: for instance, asking a friend to come with them to the community workshop or cycle shop, using online resources while in a repair shop, watching online tutorial videos with a friend in the course of repair, and so on:

> *"I took a friend to the workshop so that he would help me with the leverage to unjam a part."*[58]

Many situations that result in the use of multiple types of resources are related to the many struggles of repair: often, cyclists encounter difficulties during the repair process and have to switch out one repair strategy for another one, as occurred in the following two stories related by survey respondents:

> *"I took my bicycle to the bike repair shop, planning to get a new gear cable and learn how to fix it on my own, but when I got there, they said lots of scary bike jargon that I didn't understand, so I decided it'd be easiest to just give it to them to repair."*
>
> *"First I took it to a community bike shed, but didn't like the service at all. Besides that, it was surprisingly expensive. Then I tried to fix it myself, and it got a little better. However, as I'm not a mechanic, I used the bike daily, and I wanted to make sure it was safe to ride, I ended up taking it to a proper bike shop and spending more money*

---

[57] « Diagnostic chez moi. Achat de pièce neuve chez un vélociste du quartier. Installation dans un atelier d'auto réparation. Petits réglages finaux chez moi après le test sur le chemin entre l'atelier et la maison »
[58] « J'ai emmené un ami à la petite rustine pour qu'il m'aide en terme d'effet de levier pour dégripper une pièce. »

on it."

Of course, some of the ways in which cyclists get help are more engaging than others: while only a fifth of cyclists who sought the help of a mechanic also contributed to the repair themselves, almost all of the cyclists who received help from a community workshop volunteer or from online sources contributed to the repair of their own cycle. In the case of help from friends and relatives, two-thirds of the cyclists who sought this type of help also contributed to the repair of their cycle themselves.

Overall, the main type of help provided (in 55% of cases) consisted in the complete repair of the cycle, followed by providing advice (a third of cases) and providing physical help or tools (a quarter of all cases for each).

These general statistics do not allow for a full grasp of the experience of all cyclists who receive some support and help in the course of a repair: for example, community workshop volunteers have often not received any professional training, and both their repair know-how and their pedagogical skills can be very heterogeneous. Some discussions of the skills learning and repair executed in these spaces can be found in research that focuses specifically on this topic (Arnold 2012; Batterbury and Vandermeersch 2016b; Mené 2019).

This summary of the different types of help available shows that the cyclist is interconnected with their environment. There is no clear gap between repairing a cycle oneself or going to a cycle shop or community workshop: in practice, cyclists construct a network of assistance from different sources as they evolve, and as the opportunities and surprises of repair unfold.

3.c. The Service and Redistributing Repair Responsibility

As discussed above, many mechanics complain that many cyclists lack the initiative to maintain their cycles in good condition. Although some consider this to be an unavoidable part of their work, others implement initiatives in an attempt to make customers aware that they should check the condition of their cycle.

Many mechanics who participated in the present research had a precise idea of the frequency according to which some cycle parts should be replaced, depending on their design: some stated that cyclists should inflate their tires every other week, oil the chain every month (especially in winter), and (for derailleur gears) replace the chain approximately every six months, while the cassette should be changed following two chain replacements. Such rules of thumb are however limited in practice, since the speed at which components of a cycle deteriorate depends on the quality of these components, on their design, and on the rhythm at which the cycle is being used; for example, cycles with steel frames, inner hub gears, or high-quality manufacturing tend to be more durable. However, these rules are used by mechanics as a counterpart to the tendency among cyclists not to anticipate or identify the deterioration of their cycles:

> *I do some mechanical awareness advocacy, which is to say that people don't walk away without me explaining to them: once a month, one should inflate the tyres, clean the cassette and the chain, and oil the chain. And at the end of winter or summer, since bikes have been exposed to salt and ice, one should clean the bottom bracket and the chain. That's it, it prevents mechanical issues, and I tell them what to do so that they won't come back to me for small maintenance issues.*[59]

Rémi, mechanic, Lyon

This is why, in the cycle industry, the notion of the "service" is widespread – a service is something that a cyclist can book, and during this time, a mechanic will replace some worn parts even if there is no noticeable dysfunction of the cycle. Servicing contributes to a normalisation of cycle maintenance within cycle practices, and is thus something that many

[59] « Je fais de la prévention mécanique c'est à dire que les gens s'en sortent pas sans que je leur explique : une fois par mois il faut gonfler les pneus, il faut nettoyer la cassette et la chaîne et il faut huiler la chaîne. Et à la fin, à la belle saison, vu qu'on a pris du sel vu qu'il y avait du risque de verglas ou des embruns, il faut nettoyer le pédalier et la chaîne. Donc voilà, c'est de la prévention, je leur explique ce qu'il faut faire, ce qu'il faut pas faire, pour que s'ils reviennent chez moi ce soit pour des problèmes qui sont autres que des petits problèmes d'entretien. »

cycle shop employees and owners wish to develop (Figure 2.17).

Figure 2.17 – "Lube your bike!": child's drawing in a Melbourne cycle shop

One way to encourage cyclists to visit a cycle shop frequently is to offer them free services within a certain time after the purchase of a new cycle, in the hope that this first contact will plant the seed of a future habitual practice and contribute to the cyclist identifying the cycle shop as a reliable contact for maintenance issues. Another type of initiative corresponds to the implementation of automatic regular reminders that a service is due. In the course of this fieldwork, I encountered a cyclist who benefitted from this practice (Figure 2.18) and thoroughly appreciated it, as well as a shop owner who wished he could implement this practice in his business.

Figure 2.18 - Example of a service reminder by a cycle shop to a customer

Interestingly, services as a practice are more widely developed in Melbourne than in Lyon. Indeed, 79% of Melbourne survey respondents reported having had their cycle serviced in the previous year, while only 55% of Lyon cyclists said the same. This figure reflects the higher importance of maintenance among Melbourne cyclists, but is also characteristic of a "culture of service": most cycle shops in Melbourne offer servicing, whereas the practice of regular services is less common in Lyon.

In some cases, these services are set according to prices – the more the customer pays, the more components are replaced for them. However, many mechanics work by modulating the maintenance performed according to the condition of the cycle. Indeed, despite the aforementioned "rules of thumb", the wear of most cycle parts can be assessed through the means of diverse diagnosis tools: a chain wears by stretching, and a simple tool measures whether this stretch has reached a critical level (after which the chain should be replaced), or

another more severe level (at which point the chain must be replaced along with the cassette, which is likely to have been worn by frequent use with a worn chain). Visual inspection can also help in identifying the wear of some components: the notches of a cassette in bad condition look like shark teeth, while rusty cables work less smoothly. Other tests can be conducted by holding some parts of the cycle still and trying to move others (Figure 2.19).

Figure 2.19 - Example of diagnosis of a cycle. Credit: Roulement à Bill

All of the above notwithstanding, attempts to inform and develop maintenance habits are not yet widespread.

Cycle repair is thus a practice that is unevenly shared between many different actors and timeframes. One important issue faced by cyclists and mechanics is the shift from a repair-based attitude to a maintenance-based attitude. The different conceptions among repairers with different levels of skill regarding the importance of maintenance may lead to conflicting interactions, especially in the frame of commercial interactions between mechanics (maintenance-oriented) and cyclists (often repair-oriented).

Mechanics sometimes develop strategies designed to reduce this gap and persuade cyclists of the importance of certain maintenance operations. Moreover, a culture that normalises regular cycle servicing and cyclists frequently visiting the same cycle shop may contribute to a better inscription of cycle maintenance into cycling practices.

The repair versus maintenance gap is a central aspect of uneven repair responsibility. However, repair responsibility also fluctuates between different actors, including cyclists, cycle shops, and self-repair workshops. Repair practices often include diverse members of this repair ecosystem, each involved at a different level of a repair operation, or sometimes simultaneously. This distribution of repair responsibility varies according to the resources available (with self-repair workshops being more common and more widely used in France), individual skills (experienced repairers are more likely to perform repairs themselves), and personal preferences.

Conclusion

This chapter has explored the meanings and primary characteristics of cycle repair and breakdown. Drawing on an important area of prior research, it has allowed for the highlighting of several important results. The main one is the high importance of repair in the course of daily practices. Cyclists frequently encounter mechanical issues in their daily lives; moreover, many of them ride dysfunctional cycles. Taken together, this means that for numerous cyclists, maintenance and repair are a daily or weekly consideration, in that they impact past riding experiences (which are likely to have been affected by sudden breakdowns), current riding experiences (impeded by a dysfunctional part), and the ways in which they plan and organise their riding (according to the likelihood that a dysfunction will occur). This strong importance of repair in cycling practices must be understood and taken into account in studies of cycling, as well as in public policy geared towards the development of cycling practices.

Cycle repair practices are characterised in part by a range of phenomena that have also been observed in other studies of repair and maintenance, including the role of attention and care (Denis and Pontille 2020b; Batterbury and Dant 2019), blurriness and unpredictability (Rosner and Ames 2014), and frequent resorting to improvisation (Henke 2000). However, the lack of standard structures and processes of repair seems more obvious in the case of cycle repair than in other types of repair practices; this manifests in the dynamics that contribute to the intertwining of repair and breakdown, as well as the recurrence of the theme of frustration in discussions of cycle repair.

Once informed of this importance of cycle breakdowns in the lives of cyclists, one may be surprised to note that cyclists experience and deal with breakdowns in very heterogeneous ways. Most existing literature on repair and maintenance focuses on tasks that are typically performed either by professional technicians (Harper 1987; Orr 1996; Henke 2000; Dant 2005; Crawford 2010; Pontille and Denis 2010; Strebel 2011; Edensor 2011; Tironi 2019) or by users (Gregson, Metcalfe, and Crewe 2009; Dant 2019), with the exception of studies of spaces in which users are helped in executing the repairs themselves, such as self-repair workshops (Rosner and Ames 2014; Bradley 2016; Batterbury and Vandermeersch 2016b; Batterbury and

Dant 2019; Mené 2019).

However, in contrast to car repair, which is increasingly standardised (as illustrated by the legal requirements to insure and regularly service every vehicle), there is no standard model of attitude adopted by most people regarding cycle repair in Lyon and Melbourne. Some cyclists repair their cycles themselves, others bring them to a professional mechanic, while many cyclists resort to a hybrid of these decisions. Cyclists alternate between diverse repair options according to their levels of skill and the resources to which they have access, even sometimes not repairing their cycles at all. Cycle repair bridges the distinctions between professional and amateur, skilled and unskilled practices, as most of these different forms of repair often coexist in the daily lives of cyclists.

One way to apprehend the heterogeneous and blurry nature of cycle repair mechanisms could be to highlight the (perhaps concerning) lack of a simple and clear repair solution: indeed, the gaps and cracks between the main repair options may represent a high number of cyclists whose riding experience is made unpleasant or even dangerous. Because of this, one could for instance advocate for including cycle repair training in public education schemes, for making yearly services in a cycle shop mandatory, or for the development (and public subsidy) of a network of community workshops geared towards empowering cyclists and providing them with tools. However, it is also possible to apprehend this vast array of diverse repair experiences as the sign of a healthy repair ecosystem in which cyclists have the space to experiment, to try a repair themselves (while knowing that there is a shop nearby that they can visit if it goes wrong), to learn new skills in community workshops, or to buy parts online and ask friends for help with fitting them. I personally believe that preserving this diversity of choices, with a specific concern for inclusive and affordable repair options, should be a priority of any further development of the field of cycle repair.

Chapter III: The Cycle-cyclist Relationship

"There is a kind of love called maintenance
Which stores the WD40 and knows when to use it
Which checks the insurance, and doesn't forget
The milkman; which remembers to plant bulbs;
Which answers letters; which knows the way
The money goes; which deals with dentists
And Road Fund Tax and meeting trains,
And postcards to the lonely; which upholds
The permanently rickety elaborate
Structures of living, which is Atlas."

U.A. Fanthorpe, "Atlas", 1995

The previous chapter explored cycle repair as a stand-alone practice, without any intensive consideration of cycling practices themselves. In reality, however, the practice of cycle repair is closely related to that of cycling. Thus, in order to fully understand cycle repair, one must understand the relationship that cyclists maintain with the cycle as an object. It is this relationship that I will explore in this chapter – first through the application of existing models, and then through developing a more complete model of my own.

A starting point for developing a full understanding of the place that the object of the cycle occupies in cyclists' lives is the application of the model of material possessions (Dittmar 1992). This model defines the affective, symbolic, and instrumental "dimensions" of the relationship to an object. I apply this model to set out key aspects of the cycle–cyclist relationship that manifest in the course of cycling practices.

This application of Dittmar's model of material possessions reveals some shortcomings, which

I explore in the second section of this chapter. While distinguishing between this model's affective, symbolic, and instrumental dimensions is a good heuristic process, I argue that it is also limited in its ability to fully articulate the cycle–cyclist relationship. The discussion of these limitations facilitates a deeper understanding of the complexity of this relationship, which continuously evolves and encompasses separate, but intertwined practices that are embedded within the cyclist's daily life.

Once the contradictions and limits of Dittmar's model have been identified, I introduce and develop a theoretical concept that will be central to the remainder of this thesis: that of velonomy. The third section defines and explores this concept, based on its existing uses within activist circles and academic research. I then develop a model of velonomy that incorporates relevant concepts rooted in the academic disciplines of political science, the sociology of consumption, and mobility studies. I use data from my fieldwork to root the model of velonomy in the lived experiences of cyclists. My reconceptualisation of velonomy also brings together the studies of cycling and repair, with a focus on the political effect and processual nature of these practices, in a way that accounts for the reciprocal relationships and responsibilities between the cycle, the cyclist, and the social environment in which cycling practices occur. This in turn provides a strong theoretical basis for the understanding of repair practices, along with the way they unfold in the lives of cyclists and in the urban environment.

1. The Model of Material Possessions and Dimensions of Cycle Use

The social importance of material objects has been debated across several disciplines and within numerous bodies of research (Julien and Rosselin 2005). While opinions on this subject vary in many respects, there is a consensus that material objects play a significant role in the formation of social bonds between individuals, as well as in the constitution of society on a larger scale (Dant 2005; Daniel Miller 1987). The cycle is not only a tool, but also carries with it a range of representations that contribute to its value to cyclists. By drawing on theory from social psychology, in this section, I examine the relationship between the cyclist and their cycle, asking how cyclists relate to their cycle, what place it occupies in their life, and how meaning is built through material interaction.

First, Olga Dittmar's model of material possessions is considered, both as it is applied by Linda Steg and in its application to cyclists' actual experiences. Specifically, I highlight three dimensions of the cycle–cyclist relationship. I then analyse some responses to the cycle repair survey in order to develop a model of the affective and symbolic dimensions of this relationship as experienced by cyclists. The model of material possessions represents a first step in developing a framework of the cycle–cyclist relationship.

1.a. Discussing the Cycle as a Material Object

In order to understand the cycle-cyclist relationship, we need to understand how people relate with, to, and through material objects in general, along with how this understanding can be applied to both cycling and repair.

Repair and the Materiality of Cycling

The practices of cycle repair and maintenance are extremely material, as demonstrated by many of the documentary photographs included throughout this thesis. Chains, cogs, forks, frames, brake levers, inner tubes, spokes, spanners, brake pads – spaces of repair are full of

things, including tools and components, old and new parts, and bits of metal, rubber, cloth, and plastic. They smell of chemicals: rust remover, greases and lubricants, degreasers, and also fuel, which is often used as a cleaner. Most spaces of repair are strewn with spare parts (so many, but never enough), along with tools and partially functional cycles that exist in a state between life and death, waiting to be diagnosed, repaired, or discarded (Figure 3.1). When faced with a typical pile of cogs and bolts in a repair workshop, a visitor may wonder: what is this for? Where does it all fit on a cycle? Repair is a continuous confrontation between diverse material objects and the ideas that cyclists and mechanics have of what constitutes a functioning cycle. During repair, cycles manifest as an assemblage of parts.

Figure 3.1 - Spare parts and bolts during the repair and re-greasing of a pedal

Repairing an object, and talking about its repair, both considerably shift our focus on the object that is being repaired by emphasising both its materiality and its fragility (Denis and Pontille 2020b). In the context of cycle repair, this occurs in three main ways. First, the materiality of the cycle is brought to the cyclist's attention during repair practices; second, repair and maintenance prompt a consideration of the cycle's "needs"; third, repair and maintenance practices draw focus towards the underlying processes of decay and restoration that the cycle is experiencing. I will expand on each of these below.

When a cycle breaks down, it reveals its own materiality to its user; when cyclists recount the cycle breakdowns that they have experienced, their responses suggest that these breakdowns changed their perspective on their cycle. As discussed in the previous chapter, and explored in more detail below, cycles are tools that disappear from the attention of cyclists while they are in use, as they are incorporated into the cyclist's mind, body, and gestures (Warnier 1999; Spinney 2006). By contrast, at the time of breakdown, a cycle is brought to the forefront of the user's attention.

Susan Leigh Star, who researched the use of dysfunctional IT systems in the 1990s, describes this process of revealing as follows:

> The normally invisible quality of working infrastructure becomes visible when it breaks: the server is down, the bridge washes out, there is a power blackout. [...] Respondents would say prior to the visit that they were using the system with no problems–during the site visit, they were unable even to tell us where the system was on their local machines. This breakdown became the basis for a much more detailed understanding of the relational nature of infrastructure (Susan Leigh Star, 1999: 382)

A cycle breakdown is thus often experienced by cyclists as a moment in which they discover that behind the cycle that carries them to work, to the shops, or to school is a machine comprising multiple components. For example, many cyclists do not think about their cycle

chain until it comes off, or the inner tube inside their tyre until it is punctured. When a breakdown occurs, "the tool suddenly demands attention for itself. The reliable dealings we are used to having with the tool are ruptured, and instead of withdrawing from our attention the tool suddenly forces itself upon us" (Verbeek 2004, cited in Graham and Thrift 2007). A breakdown is a time at which the cycle forces itself upon the cyclist's attention; when the black box of cycling is opened, and its different components begin to matter.

Furthermore, the condition of a cycle becomes important and central during repair and maintenance practice. Specifically, this is the only cycle-related practice (construction excepted) during which the cyclist interacts with a cycle for its own good rather than for their direct and immediate benefit. Although repair is never fully separated from the needs of the cyclist, what is considered during the act of repair is the need of the cycle itself. Most mechanics are well aware that a used cycle will never be brought back to its original state. However, a repair is considered complete when the cycle appears to the cyclist or mechanic as once again "functional"; in short, when the parts of which the cycle is composed no longer draw undue attention to themselves.

Finally, researching repair reminds us that objects are not static, but rather constantly subject to the effects of time:

> The world is involved in a continuous dying that can only be fended off by constant repair and maintenance. (Graham and Thrift 2007: 6)

Focusing on repair means focusing on the underlying processes of decay and restoration of the material world, and thus understanding more of its complexity. The cycle is the evolving product of contradictory fluctuant processes: it will age differently according to its design, where it is stored, how often it is used, and whether it is used in inclement weather. A cycle that is frequently used is more likely to deteriorate due to the wear of its parts (tyres, brake pads, chain,

and cassette), whereas an infrequently used cycle is more likely to deteriorate due to rust or parts that become jammed after not moving often enough.

Researching repair brings the materiality of cycling practices to the forefront, as demonstrated by Tim Dant's book *Materiality and Society* (2005), which is structured around a case study of the embodied practices of car mechanics. Exploring cycling repair and maintenance brings new insights about the cycle – or the car – and reveals it as a more complex object than before.

Through a focus on repair and maintenance practices, the cycle is revealed as:

- A material object that exists outside of its immediate use
- A material object that is made out of many assembled parts
- A material object with specific characteristics that differ between cycles
- A material object with an individual history arising from its past use and treatment
- A material object that has a market value
- A material object that can be damaged
- A material object that will decay with time

Any attempt to fully understand either cycling or repair must take the complexity of the cycle as a material object into account. In particular, the study of repair requires an in-depth discussion of the cycle–cyclist relationship. The first step of this discussion focuses on the specific status of material objects in social science research.

Material Objects and Social Life

In his book Materiality and Society, Tim Dant (2005) presents an overview of existing theories pertaining to the complex relationship between society and material objects. Quoting Fernand Braudel's historical work (1992), Dant argues that historical changes are materialised by the objects surrounding us, which in their turn configure different daily practices, thus the term "material culture":

> From the perspective of the individual, objects are incorporated into the life of a person

> and extend his or her being in the world, both the material world and the social world. Looked at from the perspective of society, the object is a vehicle of the intentions and designs of the culture that can shape the actions of the individual. (Dant, 2005: 60)

Dant argues that material objects mediate the relationship between individuals and society. Furthermore, he contends that the first and most important site of this relationship is the embodied interaction between people and material objects.

Daniel Miller (1987) similarly demonstrates, following Hegel, that material objects are the way in which culture objectifies itself: that is, how it expresses itself in a tangible way in the physical world. According to Miller, this process of objectification allows culture to exist outside of individuals. However, this also comes at a price, namely that people feel alienated from culture because they are constantly surrounded by a huge quantity of mass-produced goods. Miller thus considers consumption as a way for people to position themselves culturally.

Miller also argues that objects are so ubiquitous in our daily lives that they constitute the bricks of our thought process, which is why it is so difficult to talk about, understand, or analyse them:

> These two characteristics of the artefact – its extreme visibility and its extreme invisibility – may also, through their relationship, in large measure account for our difficulty in appreciating the importance of material culture for social relations. (Miller 1987: 108)

According to Miller, this is why social science has thus far struggled to understand people's interactions with material objects:

> There is an extraordinary lack of academic discussion pertaining to artefacts as objects, despite their pervasive presence as the context for modern life. (Miller 1987: 85)

Bruno Latour also criticised the lack of research attention paid to material objects, to his mind a

problem that could be solved by the application of science and technology studies. Latour argues that, before the development of this field of research, sociologists refused to analyse material objects, based on the flawed premise that the social and the material world were two separate things, the latter therefore being the domain of natural scientists only (Latour 2000: 108).

Notably, this statement fails to consider many central approaches of materiality that have been present in social sciences such as anthropology since their inception (Julien and Rosselin 2005). However, it is also true that Latour, like Miller and Dant, contributed to the "material turn", which aimed to return focus to materiality in the social sciences in general, sociology included (Mukerji 2015). This turn was informed, among other things, by the rich cycling history research, structured by the annual International Cycling History Conference[60]. This increased interest in materiality added a new aspect to the growing field of cycling transportation research, which had previously focused on three main research areas: the built environment and cycling infrastructure; the relationship between cycling and health; and evaluating the impact of cycling policy[61].

Another evolution that centred the study of materiality was the growth of sociology of consumption, a field from which emerged a rich discussion of the relationship between people and material objects. This focus on materiality was conceptualised through the application of practice theory to consumption (Warde 2005; 2014). Practice theory thus became the dominant theoretical apparatus of sociology and consumption (D. M. Evans 2019), with the effect of broadening the concept of what would usually be regarded as "consumption":

> One of the key contributions of practice theoretical repertoires has been to expand the remit of consumption scholarship beyond the analysis of individual choices to purchase goods that are acquired through market exchanges. (Evans 2019: 507)

---

[60] Read about the International Cycling History Conference on the association's website: https://www.ichc.biz/index.php

[61] An overview of the most-cited cycling research articles can be found on Jennifer Dill's blog: https://jenniferdill.net/2017/04/23/the-march-of-bicycle-science/

Among the bodies of research that place the materiality of the cycle at their centre, the work of Jonas Larsen and Mathilde Dissing Christensen investigated the process of discarding cycles in Copenhagen, along with the materiality of parked cycles in various states of decay (Larsen and Christensen 2015). Larsen also conducted ethnographic work on cycle parking and locking (Larsen 2017), which highlighted the fact that the majority of cycles present in a city are stationary for most of the day, thereby shifting focus onto parking infrastructure and locks.

When considering other works with a focus on the materiality of the cycle, we can cite research into cycle design, with an emphasis on its evolution through time (Rosen 1993; W. E. Bijker 1995; Cox and Van de Walle 2007; Cox 2014). These studies contributed to developing the academic understanding of cycle design by accounting for the complex processes that underlie the most common shapes and characteristics of cycles. Moreover, Strömberg and Karlsson (2016) demonstrated the relevance of providing people who are willing to try cycling with cycles possessing specific shapes and characteristics. Still other studies have focused on certain specific models of cycles, along with the uses and symbolic representations attached to them: examples include works on cargo cycles (Boterman 2018), electric cycles (Marincek 2021), and fixed gear cycles (Hoor 2020).

This thesis builds on such discussions of the materiality of cycles. Beyond a simple consideration of cycles as objects, it aims to understand these objects as they are integrated into cyclists' lives through what I refer to as the cycle–cyclist relationship.

Towards a Model of the Cycle–cyclist Relationship

Following the broad overview of discussions about the relationship between material objects and individuals provided above, I now focus more narrowly on the cycle–cyclist relationship. This relationship describes the way the cycle is integrated into the cyclist's life and contributes to the constitution of society:

> It is this interaction between people as material bodies and things as material bodies that

> is the stuff of technology and the material culture of a society. Because it is so close to the ordinary flow of life, it is easy to take for granted and treat as something about which we already know because it is so familiar. And yet it is in this taking for granted of our material, embodied relationships with things that we can so easily overlook the way that our material culture gives substance to the society we live in. (Dant 2005: 84)

To begin to conceptualise the cycle–cycle relationship, I now introduce a prototype model: namely, psychologist Olga Dittmar's model of material possessions, as furthered by Linda Steg.

Dittmar (1992) designed a "model of material possessions" according to which the relationship that subjects maintain with the material objects they own can be instrumental, but also affective or symbolic. In a study of the relationship between car drivers and their cars (2005), Steg defined these three parameters more precisely, as follows:

> Instrumental motives may be defined as the convenience or inconvenience caused by car use, which is related to, among other things, its speed, flexibility and safety. Symbolic or social motives refer to the fact that people can express themselves and their social position by means of (the use of) their car, they can compare their (use of the) car with others and to social norms. Affective motives refer to emotions evoked by driving a car, i.e., driving may potentially affect people's mood and they may anticipate these feelings when making travel choices. (Steg 2005: 149–150)

Steg's study determined that a strong symbolic and affective relationship with a car is a better predictor of frequent car use than a strong instrumental relationship.

The model of material possessions recalls the suggestion made by Peter Cox to distinguish between different motives for cycling (Cox 2005). Cox suggests that cycling practices can be apprehended as they are located within two axes of meaning: from mundane to fetish, and from tool to toy. Cox brings up the political consequences of such contrasting approaches to cycling, as they may result in contradictory and sometimes conflicting meanings, representations and

public policies related to cycling.

Although, later in this chapter, I question the relevance of this artificial division between dimensions or "motives" of use, this model also partly reflects the perceptions of many cyclists I encountered during my fieldwork, and thus presents a heuristic opportunity. The remainder of this section explores the affective, symbolic, and instrumental dimensions as experienced and described by cyclists.

An important source of data for this investigation is the answers given by Lyon and Melbourne respondents to one of the very few open-ended questions included in the cycle repair survey: "How would you describe your bicycle in a few words?"[62]. The answers to this question provide first-hand depictions of the cycle–cyclist relationship that are both spontaneous and very diverse.

1.b. The Affective Dimension: Loving One's Cycle

As a researcher, I was struck by the large number of cyclists who cared deeply about their cycle and expressed love towards it. This affective aspect of cycling practices was explored in Karly Coleman's thesis (2015). Coleman shows that the cycle, one of the few objects used in the same way by both children and adults, helps its user to create and sustain relationships with communities and spaces. She argues that the embodied character of the use of the cycle is such that riding a cycle connects people with past memories, and as such is constitutive of their identity. As an example, the special status of the cycle in the heart of many cyclists was made apparent in the many responses to cycling advocate Mikael Colville-Andersen's blog post My Bike is Not a Vacuum Cleaner! (or, a Little Romance Goes a Long Way)[63].

For some people, the affective aspect is the first thing that comes to mind when asked to describe their cycle. For instance, seven of the Melbourne respondents used the phrase "my

[62] In the remainder of this section of the chapter, all references to "survey responses" refer to the answers to this specific question of the cycle repair survey. Moreover, all quotes displayed in tables at the end of each subsection are answers to that same question of the cycle repair survey.
[63] "My bike is not a vacuum cleaner", accessible at https://lovelybike.blogspot.com/2010/06/my- bike-is-not-vacuum-cleaner-or-little.html

favourite possession" or "one of my favourite possessions" to describe their cycle. Seventeen Melbourne respondents explicitly stated that they loved their cycle, with one even using the term "my partner", while for others, the term "well-loved" was one of several affectionate adjectives used in their cycle description.

Many Lyon respondents (nine of them) used terms like "companion", "friend", or "mate" (copain). For some cyclists, this love or affection felt for their cycle is the main way in which they relate to this object; they express this affection by comparing their cycle to a human being or giving it a name.

Melbourne respondents sometimes used "he" or "she" pronouns when describing their cycle, anthropomorphising the object through attributing a gender to it. In French, there is no grammatical distinction between objects and living beings; however, several cyclists expressed their affection for their cycle by pairing it with adjectives usually used for human beings ("smart", "agile", etc.).

One recurring term used to express the affection that cyclists feel for their cycle is the word "beautiful". The beauty of the cycle is sometimes expressed as something that is pleasant, even if not always adequate when compared to the requirements of the cyclist. In other cases, beauty is used as a neutral descriptor. It is very common for cyclists to describe their cycle as "beautiful" as a way of putting their unconditional love for it into words. Some examples of affective descriptions of the cycle are presented in Table 3.1.

"Cheap, cheerful & loved".
"Tattered, well-loved, a bit rusty"
"My bike is one of my passions. I pamper it."[64]
"My primary ride's name is Terrance and he's a wonderful companion."
"Hard-working"
"My hipster friend"
"Light as a feather; quick like thunder; agile like a fox"[65]
"Road bike with front basket, more pretty than aerodynamic"
"Black, beautiful, and fast"
"The most beautiful in the whole world"[66]

Table 3.1 - Affective descriptions of the cycle

Repair and the Affective Bond with a Cycle

The way cyclists repair their cycle is closely related to the affective link that they maintain with it, which determines the way in which a repair is performed. For example, some cyclists may choose to repair (or to have repaired) a cycle that they have affection for, even if it is very old and thus not "worth it".

For instance, one mechanic related the story of a customer who had hired her to restore an old cycle. This process required a lot of time and energy and was far more costly when compared to the purchase of a new, similar cycle. While she ordinarily would have refused to perform this repair, she ultimately agreed upon learning that her customer felt a very strong affection for this cycle:

---

[64] « Mon vélo c'est l'une de mes passions. Je le bichonne. »
[65] « Léger comme une plume ; Rapide comme l'éclair ; Agile comme un goupil »
[66] « Le plus beau du monde entier »

This is the bike… he's 40, this is his BMX from when he was a kid, and we're restoring it. I'll have to show you what it's coming up to. That kind of stuff, it's like, we're selling people a part of their memory, it's their childhood. But you're also selling them a dream, because they want that bike again – and it's not just the bike, it's the feeling that comes from the bike. So come have a look, I'll show you. That was what it was originally like, this is what it's like now: it's been repainted, re-chromed. When we're finished with it, it'll look like it's just out of the factory.

Sam, mechanic and shop owner, Melbourne

Another cyclist explained how she had taken a lot of trouble to repair a cycle, even though she had been told it was impossible, because she loved it dearly:

Actually, I didn't have time for it, I thought I'd go [to the shop] and pay for the repair. And I was told, "No, it's only fit for the bin – if you want, we can issue you a €20 voucher for a new bike, but that's all we can do." I said, "no way, I won't discard it, it's my horse. I chose it with love." So I went to the self-repair workshop. They said, "Not all is lost, but you'll need someone who can weld aluminium, and we don't know anyone." So I called my mate who rides a Vespa and asked him to find me an aluminium welder [laughs]. Then I found one, and it took him three months to weld my thing… And for that, I had to take the bike entirely apart, so I removed the brakes, the chain… everything. And then I came back to the workshop in order to put everything back on.[67]

Marlène, cyclist, Lyon

[67] « En fait j'avais pas le temps, je me suis dit je vais aller [au magasin] et je vais payer la réparation. Et le [magasin] il m'a dit "Non il est bon à mettre à la poubelle, si vous voulez on vous fait un bon de 20€ pour achat d'un vélo neuf mais c'est tout ce qu'on peut faire". J'ai dit "Non, on va pas le mettre à la poubelle, c'est mon cheval, il en est hors de question. Je l'ai choisi avec amour." Donc je suis allée à [l'atelier vélo]. Ils m'ont dit "non, tout n'est pas perdu, mais faut que vous trouviez un soudeur alu mais nous on connaît pas". Donc j'ai appelé mon pote qui fait de la Vespa pour qu'il me trouve un soudeur alu [rit], j'ai trouvé un soudeur alu, il a mis trois mois à me réparer mon truc… Et pour faire ça il fallait que je le démonte entièrement donc j'ai enlevé tous les freins, la chaîne… tout. Et ensuite je suis retournée à l'atelier de vélo pour tout remonter dessus. »

The affective link between a cyclist and their cycle thus may lead them to go out of their way to perform a repair.

Reciprocally, repair may also transform the affective link between cyclist and cycle. For example, Gary, a cycle workshop volunteer, enjoys restoring old cycles in his free time. For him, spending so much time working on cycles turns them into special objects that he does not want to sell; instead, he prefers to gift them to people who will regard these cycles as highly as he does:

> *Yeah, I couldn't part with them! Because I had invested time and effort into them, I sort of fell in love with… with them a bit, they're like a piece of hard work, you know. But what I found also is it's easier if it's someone who really enjoys that bike too. If a friend comes around, and a couple of times, too, like, "oh, wow, that's a really cool bike… I really love that bike", [I say] "so would you ride it?", and they say "Yeah, yeah!" – "Well, have it!". You know, I got rid of a few that way, and that was pleasing, you know.*

Gary, workshop volunteer, Melbourne

Similarly, another Melbourne community workshop volunteer stated that visitors to the workshop often came there not only for the convenient access to affordable cycles, but also because they knew that they would create an affective bond with an old cycle by repairing it:

> *I think that the people that we deal with very much have this sense of satisfaction, a sense of satisfaction that "this is now my bike". This bike, I've worked on it for a couple of weeks, and now it is actually mine. I think people, they come to the [workshop], they might say "I want to build a bike, I want to make a bike", where actually what they want to do is just be… involved in bringing a bike back to life, [which] they would then have this relationship with.*

Donald, community workshop volunteer, Melbourne

In many cases, the affective dimension of the cycle–cyclist relationship is therefore at play in the way cyclists decide to repair (or not repair) their cycle. It can also intervene when it comes to bringing a cycle to a shop for repair: one mechanic told me that he had been taught to treat a customer's cycle with particular care and to ask them for their permission before touching it, in order to respect their affective relationship with the object.

This link between repair and a cyclist's affective relationship with their cycle also appears in the survey answers (Table 3.2). Indeed, when cyclists talk about their cycle, they often discuss repair as a metaphor for love, for example by expressing worry that they have not been "taking enough care" of their cycle. Other cyclists say that they love their cycle despite its (mechanical) flaws; in this situation, the poor function of a cycle may become proof that it is loved, since its owner rides it despite its condition. Mechanical issues may also represent specificities of the cycle that make them unique and special in the heart of their owner; they can also represent the intensive use that has been made of it, and thus the affective memories that cyclists have accumulated with and through their use of the cycle.

"Very big, often with something going wrong with it, a bit heavy, but so convenient, I love it"[68]
"Old and worn but it works very well. And it is beautiful! :)"[69]
"Well-used and getting a little old and tired"
"A genuine & reliable clunker that needs a service and some love"
"A well-maintained road bike from the 90s and my one true love."
"Great, it has been of great use to me, but I have some repairs to do, specifically the handlebars"[70]
"A pretty bike that deserves more attention than I give it"[71]
"A gorgeous wreck"[72]
"My bike is beautiful. It rides well, even though the brakes are not the best and the luggage rack moves a bit"[73]
"It is beautiful, blue, old, in frequent need of repair, and very useful, and swaaaag"[74]

Table 3.2 - Condition of the cycle and affective relation to it

1.c. The Symbolic Dimension: Being Proud of One's Cycle

Attachment to a cycle is often related to the construction of the cyclist's identity. This is the argument presented by Coleman, for whom "the bicycle as object helps to create and maintain a person's identity over time" (Coleman 2015: 123).

[68] « Très grand, souvent avec un truc qui dysfonctionne, un peu lourd mais tellement pratique, je l'aime »
[69] « Vieux et usé mais il fonctionne très bien. Et il est beau ! :) »
[70] « Génial, il m'a bcp servi mais j'ai quelques réparation à faire notamment le guidon »
[71] « Un joli vélo qui mérite plus d'attention que je ne en lui accorde... »
[72] « Une magnifique épave »
[73] « Il est beau mon vélo. il roule bien, même si les freins ne sont pas les meilleurs et que le porte bagage bouge légèrement. »
[74] « Il est beau, bleu, vieux, à réparer souvent et très utile et swaaag »

Cycles for Status

As defined by Ashmore et al. (2018: 1), "Symbolism concerns itself with what individuals or groups feel their choices say about them to others in terms of social placement". According to the theory of conspicuous consumption developed by the economist Thorstein Veblen, material objects can confer social status to their owners, with individuals expressing their belonging to a certain class of wealth through their consumption practices, including the generation of excessive waste (Veblen 1899). A similar view was articulated by the sociologist Pierre Bourdieu, who considered the material consumption of individuals as a way for them to manifest the economic, social, and cultural capital they possess (Bourdieu 1979). In this way, it may be said that the first stage of an individual developing a symbolic relationship with a cycle takes place through the search for a cycle that will be valued by friends and strangers, providing its owner and user with social prestige and status. Of course, the ways in which cycles embody class, wealth, and status differ across geographical and cultural areas: Ashmore et al. (2018) showed that whereas cycle use is socially valued in Northern European countries, it is associated with a low social status in other national cultures, such as in India.

As shown by the survey responses and discussions with cyclists, the relationship that cyclists maintain with their cycle is indeed loaded with symbolic meaning, and they are aware that their cycles may confer some social status or recognition (Table 3.3). Many of them express how valuable a cycle is by describing it as very rare or unique in some way (for example, if it comes from another country, or is made of unusual materials or components). Others mention established and recognised cycle brands as a way to signal that the object that they own is rare or of high quality.

Cool Cycles

With the contributions of the sociologist Pierre Bourdieu, the study of social class and status became more nuanced and complex. Bourdieu argued that "high status" was not monolithic,

and could instead be divided between the accumulation of different types of capital, related to preferences for different material goods (Bourdieu 1979). Miller suggests that this complexity goes further, in that material objects not only embody and reinforce social class, but can also provide a basis around which social groups are constituted: "one of the many results of the rise of material culture as a mode of cultural form [is] its ability to multiply and keep apart a plethora of hierarchies and diverse spheres" (Daniel Miller 1987).

Through purchasing and using material goods, individuals position themselves within material culture – a conception that integrates the possibility for individuals to belong to different social sub-groups, which may overlap or co-exist in different spheres. Several sociologists of consumption have argued that to focus on remarkable objects and spectacular purchases alone would be to miss the point, as the social construction of identity could also occur through more mundane purchases and the material objects involved in daily habits (Shove and Warde 2001; Gronow and Warde 2001).

The cycle as a material object can thus be the basis of the formation of different subgroups. Indeed, as Coleman insists, "The cycle as object can reinforce and show a person's connection to, and disconnection from, others" (Coleman 2015: 116). Case studies in different countries have revealed how various subgroups are constituted around, and confer meaning to, different types of cycles according to a specific local context. For example, in the Netherlands, cargo cycles are associated with family lifestyles (Boterman 2018). In Japan, different cultural subgroups organised around the cycle coexist in a sometimes paradoxical way: while recent public policy has focused on developing representations of cycling as the modern way for an executive to commute to work, it fails to consider the strong pre-existing culture of women riding cycles on the sidewalk for non-commuting trips (Lagadic 2022). Similarly, in India, middle-class cycling activists are transforming the meaning of cycling from a low-class activity to a high-end and environmentally friendly form of transportation (Anantharaman 2017). Some groups of young people in Berlin develop bonds with each other and a feeling of belonging through a shared material culture centred around the fixed-gear or "fixie" cycle (Hoor 2020). Another example of conflicting representations of cycling embodied by different subgroups is presented in Lucy Baker's compelling work on the cycles shipped from Europe to Namibia by NGOs. Baker shows

how these cycles, most of which are mountain cycles, are appropriated by younger generations and associated with fashion, leisure, and fun, in contrast to "roadster" cycles, which are older models that are in widespread use but associated with older generations, work, and family values (Baker 2020; 2018). A final example of the cycle-based materialisation of different subgroups can be found in Zack Furness' study of the punk cycling culture in the United States of America, which shows how this subgroup has created links between cycling and the resistance to a dominant car culture (Furness 2010).

Attachment to the cycle as an item that connects its owner to specific subgroups frequently appears in the survey responses (Table 3.3). Many cyclists describe their cycle as "cool", "stylish", "trendy", or "swag"; these terms express the recognition by others (friends, peers, or relatives) that the cycle is beautiful or good. To them, and to many cyclists overall, the opinion that some other people may have of their cycle contributes to their own appreciation of it.

The Quest for Vintage Cycles

In mainstream cycling practices, high-end and expensive materials such as carbon and titanium are often celebrated by cycle owners due to their association with very useful and valued qualities, such as being light, compact, or strong.

However, symbolic status is sometimes also expressed through the concept of "vintage": this term, widely used in the fashion industry, conjures notions of nostalgia, authenticity, and identity (Veenstra and Kuipers 2013). "Vintage" is a celebration of older objects and of second-hand purchasing; as such, it may stand in opposition to the more widespread view of what constitutes a good cycle (recently manufactured from the lightest and most up-to-date components available). In England, a major celebration of vintage cycles occurs under the name of "tweed runs". These events arose in opposition to the culture of sports cycling, which manifests in the form of cyclists wearing lycra and aerodynamic helmets, even when they were only commuting (Oddy 2018). The ownership of a vintage cycle also indicates some knowledge about, or knowledge of, older objects, and thus becomes a display of the cyclist's cultural capital (Veenstra and Kuipers 2013).

Older cycles may be harder to maintain, as it is more difficult to find replacement parts. This is why several cyclists who describe their cycle as "vintage" also find it necessary to specify its condition and whether or not certain parts have been replaced. For some mechanics, older cycles are a pain to repair, and an interest in vintage cycles is questionable:

> *Well, it's old Motobécane, old Peugeot, fitted with 50 different parts because it's had 40 different repairs, nothing fits anymore, he's put on some tyres that are too wide and don't fit the mudguards, and the mudguards are bent, they're plastic, they're broken… At some point, you should throw things out. I know a lot of people want to reduce waste but there are some limits.*[75]

Val, mechanic and shop owner, Lyon

As the above quote suggests, the symbolic representations of older and vintage cycles differed significantly between Lyon and Melbourne. As indicated earlier, Lyon cyclists are significantly more likely to own second-hand and older cycles. In Melbourne, there are several shops that specialise in the renovation of old cycles (for example, by building up older frames with more recent components), whereas no shop of this type existed in Lyon at the time of this study. One mechanic from one such shop explains that the taste for vintage cycles among Melbourne cyclists is difficult to satisfy, given the low quantity of older good-quality cycles in the city:

> *I think it's easier for people to find really nice bikes in Europe than here. It mostly has to do with the huge cycling culture that existed in Europe for a long time, whereas in Australia, no one really had commuter bikes before the late seventies, and then big manufacturing came in, but there's just not that many people there.*

Michael, mechanic and shop owner, Melbourne

---

[75] « Bah c'est du vieux MBK, du vieux Peugeot, monté avec 50 pièces différentes parce qu'il a eu 40 réparations différentes, que y'a plus rien qui correspond, il a mis des pneus trop gros ça passe pas dans le garde boues, les garde-boues sont tordus, ils sont en plastique ils sont pétés… Il y a un moment, il faut jeter quoi. Je sais que beaucoup de gens sont en mode récup mais après y'a des limites quoi. »

This scarcity of older cycles means that they are more sought after and considered more valuable; by contrast, in Lyon, the large quantity of older cycles present on the street may diminish their appeal to cyclists. This may be why the same cycle that is considered a vintage gem in Melbourne would be viewed in Lyon as a rusty, unremarkable old cycle that should be thrown away. The symbolic dimension of older cycles, and thus their economic value, is therefore dependent (among other things) on geographical context.

Loving Ugly Cycles

Whether or not an individual cyclist enjoys fancier and more expensive cycles, their symbolic attachment to their cycle may strengthen their sense that their cycle represents them not only as a cyclist, but also as a person. This is reflected in some of the survey responses in which cyclists express the idea that their cycle is special, with some respondents even specifying that it "looked like them" (Table 3.3).

While this idea that a cyclist's cycle is similar to them – that it almost is them – was not often articulated directly by survey respondents, it can be seen to underlie many of their answers. For instance, several cyclists described their cycle with adjectives that could be interpreted as negative, if they were not in juxtaposition with other adjectives expressing a strong affection for the same cycle. This indicates that, in some cases, the same characteristics of a cycle that might make it unfashionable or unattractive to many people are considered by its owner to be reasons to prize it.

In these examples, deprecating terms that indicate either poor condition or bad fashion taste, such as "dorky", "daggy", or "ghetto", are used in an affectionate way. It seems that their owners take some pride in being associated with an object that is clearly imperfect, ugly, or dysfunctional. One reason behind this pride may be that the owner feels that few other people can perceive the value of their cycle, and thus, that their own bond with it – and with the small group able to perceive its value – is strengthened.

"High-end, custom-made"[76]
"Hand-made in France, carbon road bike"
"Rare item (vintage road, high-end), well-equipped (Brooks etc.)"[77]
"It's a titanium masterpiece."
"It is a vintage bike from '79, a Peugeot new style, non-folding with a basket"[78]
"A beautiful Peugeot bike that everyone admires as it is so unique, I bought it in France"
"Cool"
"A bike from 1970 that has got some style, it rides but is clearly uncertain mechanically"[79]
"My only reliable means of transportation. I spend my life on it… and sometimes vacations too. It looks like me."[80]
"It's me in non-human and two-wheeled form"[81]
"Unique"
"It matches me well, practical and a little dorky"
"Daggy girl's bike with baskets for all my shopping"
"Single-speed, ghetto, beautiful"

Table 3.3 - Symbolic descriptions of the cycle

1.d. The Instrumental Dimension: Using One's Cycle

For many years, academic discussion of the instrumental uses of material objects remained relatively sparse. Dant argues that social science has long had an excessive focus on the

[76] « Haut de gamme, sur mesure »
[77] « Pièce rare (route vintage - haut de gamme), bien équipée (brooks etc) »
[78] « C'est un vélo vintage année 79, un Peugeot nouveau style non pliant avec un panier »
[79] « Un vélo de 1970 avec du style, roulant mais clairement incertain mécaniquement. »
[80] « Mon seul moyen de transport fiable. J'y passe ma vie… Et les vacances parfois aussi. Il me ressemble. »
[81] « C'est moi en non humain et 2 roues »

symbolic aspect of material objects:

> The material objects of consumption are treated as signifiers of social class and status, telling us about their owners as individuals who have acquired or inherited wealth and the capacity to read and recognize these signs. What is overlooked is how objects are lived with, how their form leads to certain types of actions and curtails others, or how the presence of the objects within a life affects the bodily experience of those who use them. (Dant 2005: 25)

To illustrate this, Dant uses the example of a watch. From his perspective, most sociological research tends to perceive a watch as a symbol of power and wealth; however, such research overlooks the effects of such a watch on the person wearing it, their daily life, their embodied movements, and their interactions with others. Similarly, a car as an object can give some prestige to its owner, but it also drastically transforms their daily life as well as their social interactions.

Two years later, Shove, Watson and Ingram made a similar observation:

> The notion that people buy consumer goods simply because they need them is more common in everyday life than in contemporary theories of consumption and material culture. (Shove et al., 2007: 22)

Describing the instrumental use of material objects is difficult because the uses of such objects are so central in our lives that we struggle to describe, understand, and conceptualise them (Daniel Miller 1987). This is why "procedural knowledge" – or the understanding of how exactly an object is used during a technical operation – is extremely difficult to describe or analyse (Watson 2006).

Despite this difficulty in expressing its use, the cycle is first and foremost a tool, and as such, is highly valued for its utilitarian function; it is known to be a reliable, affordable, and healthy way to get around (Anable and Gatersleben 2005). Over 120 survey respondents (14% of all

respondents) used the terms “practical”, “useful”, “utilitarian”, “efficient”, or “functional” when asked to describe their cycle (Table 3.4). For many cyclists, how well their cycle meets their needs is the only thing there is to know about it.

Several cyclists specify that although they value the functional use of their cycle, this does not mean that they care about how precisely or efficiently it works. Some do not feel overly bothered by certain significant defects, such as broken gears. Another cyclist simply says that their cycle “rides”, which indicates that several other instrumental functions of this cycle may not be fulfilled (it rides, but does it brake? Does it change gears? Is it comfortable?). For some cyclists, the primary instrumental aspect is that the cycle is not broken and that it satisfies their most basic needs. By contrast, others describe their cycles as efficiently fulfilling most of their needs (Table 3.4).

“Convenient for what I use it for”[82]
“Transport”
“Fit for purpose”
“Very simple (the gears do not really work), not chic, not expensive, functional.”[83]
“It gets me from A to B.”[84]
“Does the job.”
“Not incredible, but it works well and gets the job done (it is mainly here to be used).”[85]
“Light but strong, reliable, comfortable, a tool for everyday life, a leisure vehicle, made for travel, a great machine”[86]

[82] « Pratique pour l'utilisation que j'en fais »
[83] « Très simple (vitesses pas vraiment utilisables), pas chique, pas cher, fonctionnel »
[84] « Il m’amène d’un point A à un point B. »
[85] « Pas incroyable, mais fonctionne bien et tient la route (il a surtout pour but d’être utile) »
[86] « Léger mais robuste, fiable, confortable, un outil du quotidien, un véhicule de loisir, taillé pour le voyage, une super machine »

Table 3.4 - Instrumental descriptions of the cycle

In the process of gaining a better understanding of cyclists' lived experience of the instrumental dimension, I identified a split between two scales of this experience. The first scale of this instrumental relationship may be referred to as "general": that is to say, at the scale of the cyclist's life and projects (such as commuting to work, keeping fit, carrying groceries, saving money on a trip that would otherwise have been taken via public transportation). The second scale of this relationship could be referred to as the "embodied": this is the scale of the individual cycle trip, during which the cyclist is in movement. I will now further explore these two scales, or dimensions, of the instrumental relationship; this will permit a more fine-grained understanding of how cyclists relate to their cycle at different levels and steps of their experiences.

The General Instrumental Relationship: Cycling as Part of the Cyclist's Daily Life

The instrumental dimension of cycle use was discussed frequently in the survey responses, with 42.3% of respondents mentioning the general use they made of their cycle when asked to describe it. This discussion accordingly contributed to outlining the objectives that cyclists considered to be met through their use of a cycle. For many respondents, the cycle is not associated with a specific activity, but rather with a general goal; thus, when asked to describe their cycle, many cyclists relayed how it helps them to transform their life in a desired way, or how it fits with their core values.

Table 3.5 provides some examples of this scale of general use as experienced by survey respondents. Melbourne cyclists were more likely to mention "freedom", "fun", or "leisure" than Lyon cyclists, most of whom preferred to focus on specific activities. Whereas several cyclists used very general categories (like "happiness") to describe what they wanted to or liked to use their cycle for, others were much more specific, describing the precise type of activity for which they required their cycle: a long commute, carrying heavy groceries and children, being able to fold it for train rides… In some ways, cyclists consider their cycle, its shape, and its components

as a way to solve specific challenges they may encounter in the course of their daily life.

”My favourite mode of transportation to get around in town (on flat terrain), a fantastic tool for freedom.”[87]
“Environmental and healthy”
“Mental health machine”
“Freedom, fun, independence”
“I can carry my weekly groceries and get to work.”
“It's a Moulton small-wheeled bicycle, fully suspended, that can be pulled apart for transporting”
“A very simple and light bike (easy to carry – it is important for me, since I sometimes take it in public transport, and I have to carry it to my flat on the third floor as there is no safe parking spot)”[88]
“Special bike for the city, with a saddle set back, for an easier position when setting my foot down at red lights.”[89]

Table 3.5 - General scale of the instrumental relationship

The Embodied Instrumental Relationship: Cycling as a Sensorial Experience

The second scale of the instrumental dimension identified in the present research is its embodied aspect. This aspect integrates the sensorial aspects of riding a cycle: the pleasure, comfort, safety, and relaxation that it encompasses. Unlike the general scale, the embodied

[87] « Mon moyen de locomotion favori pour me déplacer en ville (à plat), un outil formidable de liberté. »
[88] « Un vélo simple et très léger (facile à porter - c'est important pour moi, car je le charge des fois dans les transports publics et aussi car je dois le porter chez moi au troisième étage car je manque d'endroit pour le garer). »
[89] « Vélo spécial pour la ville, avec selle en retrait par rapport au pédalier, pour pouvoir poser le pied facilement aux arrêts. »

scale relates to the experiences of the cyclist when "on the cycle"; in short, the experiences of the cyclist *during* a cycle journey. In the below, I describe the embodied instrumental relationship and the different ways in which it unfolds in a cyclist's experience. The first form that this embodied relationship may take is that of the "cycle–cyclist hybrid".

The Cycle–cyclist Hybrid

One way of understanding the instrumental relationship between the cyclist and their cycle is provided by Jean-Pierre Warnier's research on techniques and tools (1999). It draws primarily from Marcel Mauss' lesser-known text on techniques of the body (1934), in which Mauss shows how the use of techniques is highly cultural. Mauss provides the example of French soldiers being unable to dig a trench with English shovels, which serves as a basis for the idea that technical practices are socially acquired. Warnier goes further by coining the phrase "incorporation of techniques by individuals". In his view, a subject who uses a tool during a technical operation integrates it into their "corporal scheme". As a result, the way they perceive the world is transformed by their use of the tool: the hammer extends the hand that holds it, and subjects perceive the end of the hammer as an extension of their own body; they do not focus on the contact between their body and the hammer, but rather on how the head of the hammer hits the nail.

This subject–object integration was also described in the field of mobilities research: for example, in the cases of windsurfing (Dant 1998; Dant and Wheaton 2007) and car driving (Dant 2004; Urry 2006). John Urry showed how car drivers see their body as restricted, but also extended, while driving; their senses are distorted by being inside the vehicle, and they tend to look further, taking into account the fast-moving vehicle they are in, and steer as if they were one with the car: "The car can be thought of as an extension of the senses so that the car-driver can feel its very contours, shape and relationship to that beyond its metallic skin" (Urry 2006). This driver–car hybrid, or assemblage (Dant 2004), is a key example of the way individuals change their perceptions of their environment by incorporating the affordances of the vehicle

they are using.

When it comes to cycling, the cycle–cyclist hybrid is described in Spinney's text about climbing Mont Ventoux as a road cyclist (2006). He argues that the link created between the cyclist and their cycle during the action of cycling, through the intensity and immediacy of this action, creates meaning and identity. This resembles what Cosmin Popan describes as eurythmia, "skilfully coordinating the rhythms of my body with those of the bicycle as well as with those of the motorized traffic" (Popan 2019: 134). Spinney argues that, while riding, "The bike and body are thus produced as one: refined and maintained in conjunction with each other through and within movement." He describes the expression of this hybridisation in cycling as follows:

> Gearing is felt by the rider – the machine asking the rider to maintain a circular movement, perhaps lower or raise the speed of the rider but maintaining movement of the legs and lungs at a manageable pace. (Spinney 2006: 719)

This example shows how, within the cycle–cyclist hybrid, the rider experiences the mechanical attributes of the cycle as if they were qualities of their own body.

Although this feeling of hybridisation is difficult to formulate, since it is, as argued above, an unconscious process most of the time, some survey respondents did express a similar feeling. As it is experienced by cyclists, the embodied dimension comes with a focus on certain sensations, such as comfort, effort, pain, or a certain relationship to the weight of the cycle. I expand on these sensations below.

Comfort

The sensory experience of cycling involves cyclists being exposed to many sights, smells, and sounds, both familiar and unfamiliar – a phenomenon that is to a certain extent accentuated at night (M. Cook and Edensor 2017) – while also being extremely difficult to grasp, articulate, or analyse (Cox 2019). These sensory experiences may appear as pleasant or unpleasant, with many cyclists describing a feeling related to comfort or discomfort while riding: twenty-one

survey respondents spontaneously used these terms in order to describe their cycle. When using the term "comfortable", cyclists expressed a great diversity of aspects of the experience of riding in cases where the fit between their body and their cycle is successful (or at least adequate). Often, the idea of comfort was associated with an upright position, which typically requires the rider to stretch less, although this was not always the case. It was also sometimes associated with the feeling that the cycle is easy to handle, pleasant to ride, or allows for "smooth riding".

Effort and Pain

The embodied relationship with the cycle is, for many cyclists, related to the effort and pain they experience when using it. This physical effort is sometimes considered to be a reason for, or an inherent part of cycling (Spinney 2006). Cox describes the practice of riding an indoor, stationary cycle, connected to screens displaying pictures of landscapes (Cox 2019: 113–115): in these practices, many of the usual sensory stimuli associated with cycling are absent, whereas effort and pain become central. For others, effort and pain are a deterrent or a downside to the experience of cycling, something that a utopian cycling city would reduce (Popan 2019). This relationship with physical effort also depends on certain characteristics of the cycle in question (gears, weight, riding position, tire width, electric assistance, etc.), Some survey responses highlight a capacity of the cycle itself to ride fast, as if it removed any need for physical effort. The cycle is thus perceived as both a tool for experiencing physical effort, along with the potential joy or pain associated with such effort, and simultaneously as one that liberates the cyclist from physical effort. This is possibly the feeling that one cyclist was attempting to humorously express when saying that their cycle could be described as "Tough, easy".

Heavy or Light

Many cyclists mention the weight of their cycle (67 uses of the terms "heavy" or "light"). Metaphors (such as "tank") are often used to convey a sense of the heavy weight. Respondents were three times more likely to discuss the weight of their cycle than its comfort. Indeed, most

components and characteristics that make cycles more convenient for use in an urban setting (steel frame, mudguards or racks, child seat, etc.) also make them heavier. Therefore, cyclists feel that they need to strike a balance between increased comfort and decreased weight (often considered to be the way to improve efficiency).

However, this preoccupation does not reflect the fact that, during commuting trips, the weight of a cycle is not the primary factor that affects how efficiently a cyclist can move across the city (especially in rather flat areas, like most of Lyon and Melbourne). Even in the case of competitive cycling, the emphasis on the weight of a cycle is often exaggerated, as cycle weight is only one of the many factors influencing cycling efficiency, and rarely the greatest determinant, especially when compared with the weight of the cyclist themselves (D. G. Wilson and Schmidt 2020). This common association between weight and efficiency has been reinforced by marketing strategies developed by the cycling industry in order to provide customers with an image of novelty and modernity, something made possible by the construction of lighter components[90].

Table 3.6 provides some examples of survey responses illustrating the diverse aspects of the embodied relationship.

"An extension of my body"[91]
"A fantastic piece of machinery that relies on my physical effort to propel and enjoy"
"It's really fun downhill"
"A very good tool, comfortable, personalised for my own use."[92]
"Great for fast but comfy commuting"
"Too big for me (my husband bought it for me without me being present), it is heavy and difficult to ride as it is cumbersome"
"It is an old and good bike, but the cogs are extremely worn, which makes its use quite

[90] The topic of cycle marketing is discussed further in the fourth chapter of this thesis.
[91] « Le prolongement de mon corps »
[92] « Un très bon outil, confortable, personnalisé pour mon utilisation. »

'technical'".[93]
"It goes like a rocket!"
"Wonderful, first time owning a new bike and it zooms, baby. It zooms!!"
"It is an electric bike with good autonomy, that goes fast, but a bit heavy."[94]
"Heavy and sluggish, but a good bike to build up skills on"
"Made heavier by a child's seat and by the child"[95]

Table 3.6 - Embodied dimension of cycle use

Instrumental Dimension and Repair

When asked about their cycle, many survey respondents (27%) mentioned its condition. Respondents described their cycles as rusty, needing regular replacement of parts, or expressed their pride that their cycle works perfectly or "as new". The reliability of a cycle seems to be a very important criterion when it comes to the cycle–cyclist relationship. This factor was emphasised in the case of older cycles or those purchased second-hand: for example, "Weathered but maintained commuter workhorse", or "Cheap second-hand bike that works okay but needs to be adjusted regularly". Cyclists who owned several cycles sometimes listed model and condition together, as in the following response: "I have a road bike in very good condition, a training bike in good condition, a commuter in average condition, and an old mountain bike in poor condition".

It is unsurprising that the instrumental dimension of a cycle is linked to its overall condition. A cycle that functions poorly is often less likely to be able to be used for a cyclist's desired purposes, while its efficiency and comfort is often facilitated by its being finely tuned and maintained; this is why a discussion of the instrumental dimension is very often presented

[93] « C'est un vieux bon vélo mais les pignons et plateaux sont extrêmement usés ce qui rend son utilisation assez "technique" »
[94] « C'est un vélo électrique de bonne autonomie, qui avance vite, mais un peu lourd »
[95] « Alourdi par un siège enfant et l'enfant »

together with a discussion of the cycle's condition. In some cases, cyclists seem to relate to their cycle more in terms of repairs (past, possible, or necessary) than in terms of the way they cycle with it. Others describe their cycle as the outcome of successive repairs that they have performed. These examples show that the cycle–cyclist relationship is something that unfolds over time, through successive repairs as much as through successive rides and cycling trips. Table 3.7 provides some examples of descriptions of cycles that integrate a discussion of their condition and of their instrumental use.

"A beautiful red seat, brakes that need fixing, wheels that soon need to be replaced."[96]
"Pretty bike, light, not eye-catching or expensive enough to be stolen: it is thus perfect, with the exception of a few little things that require repair."[97]
"It is beautifuuul! It's an old bike, more than 30 years old, very resistant and reliable! Few original components, since I replace them one by one when they get tired due to their age. It is my faithful companion for daily life, at any time, in any weather!"[98]
"My first bike, acquired thirty years ago, but very good components were used back then, so there's nothing to replace, I just have to maintain it, and it is used daily. I love it."[99]

Table 3.7 - Instrumental dimension and condition of the cycle

To conclude, this section focuses on the different ways in which people relate to their cycles. After introducing the inherent materiality of cycling and repair, I suggest an initial or prototype model for describing the cycle–cyclist relationship: the model of material possessions. This model comes from the field of psychological research, and fits many of the ways in which

[96] « Une belle selle rouge, des freins à rétablir, des roues à regonfler et bientôt changer »
[97] « Joli vélo, léger, pas assez "voyant et cher" pour être volé, parfait donc mis à part quelques bricoles à réparer dessus »
[98] « Il est beauuu ! C'est un vieux vélo qui a + de 30 ans, très résistant et fiable ! Peu de pièces d'origine car je les change une par une petit à petit et qu'elles sont fatiguées par leur âge. C'est mon compagnon fidèle du quotidien, par tous les temps et horaires ! » l
[99] « Mon premier vélo acquis il y a 30 ans mais très bon matériel d'époque donc rien à changer juste à entretenir et utilisé quotidiennement. Je l'adore. »

cyclists talk and feel about their cycles; indeed, most cyclists describe cycles in ways that match one of the three dimensions (affective, symbolic, instrumental). The model of material possessions thus presents an important heuristic for describing diverse aspects of the cycle–cyclist relationship. It is a first milestone in conceptualising and describing this relationship as it unfolds within cycling and repair practices, and is highly valuable due to its focus on the cyclist's attitude towards their cycle. This provides cycling researchers with an extensive picture of these diverse attitudes as they unfold through the many quotes shared throughout this section. However, this model also has several shortcomings when it comes to theorising both cycling and repair practices. The next section addresses these shortcomings and proposes a redefinition of the cycle–cyclist relationship.

2. Beyond Dimensions – Towards Material Interactions

The discussion of the model of material possessions presented above has shown that this model facilitates an understanding of some of the ways in which cyclists discuss and relate to their cycles. However, it also has some limitations, which I now wish to address. These limitations can be summarised as follows: the choice to separate out three dimensions; the lack of a common language to discuss cycling and repair together; and the lack of consideration for the evolving nature of the cycle. After outlining these limitations, I introduce a selection of theories of material interaction, which I argue are a first step in going beyond them.

2.a. The Limitations of Separate Dimensions

Although the separation between different dimensions inherent to the model of material possessions facilitates an intuitive categorisation of different types of cycle use, it does not allow for a full grasp of the cycle–cyclist relationship. In practice, there are many cases in which the affective, symbolic, and instrumental uses of a cycle overlap, contradict, or reinforce each other in complex patterns.

An overview of survey responses allows a glimpse into the overlap between dimensions. Some cyclists describe their cycle as objects of conflicting dimensions: beautiful but not very efficient, or functional while not imbued with any affective meaning. However, many others described their cycle as worthy of pride and affection, as well as useful in both a general and an embodied way, as in the following examples:

> *"A very light, fast and pretty companion, that I created and assembled myself. It makes me happy."*[100]
>
> *"Tricked out, all-singing, all-dancing, all bells and whistles, green enduro/gravity machine"*

[100] « Un compagnon très léger, rapide et joli, une création/montage personnel qui me rend heureuse. »

Through creating distinct categories, the model of material possessions facilitates the exploration of each extreme of the cycle–cyclist relationship. However, the imposition of such categorisation may result in an excessive separation between these dimensions. This is the argument brought up by Coleman, whose work focuses on the affective relationship between a cyclist and their cycle (Coleman 2015). Coleman shows how this affective link is constituted and intertwined with actual uses of the cycle (for instance, whether or not it affords some autonomy to the rider), and thus with the cyclist's instrumental relationship with it (2015: 73–79). Thus, the different uses made of the cycle nurture the affective relationship that may be maintained with it. Following Coleman, we can observe that an affective cycle–cyclist relationship is strengthened by regular and easy use. Similarly, many people take pride in their instrumental use of their cycle, as an object that they have travelled with, climbed hills on, and on which they have carried diverse objects. Reciprocally, a cycle that makes its owner proud or that is loved by them is also likely to be used more often or in a greater range of circumstances, and thus to fulfil a greater instrumental role. A cycle that rides comfortably is more likely to provide its owner with happiness or freedom, and therefore more likely to become a tool for attaining a better state of health or certain sporting achievements. Of course, motives for riding transform the link between affective and instrumental dimensions: cyclists riding for exercise and those riding for transportation may have different interpretations of the embodied experience of riding, including any associated pain, effort, and exhaustion.

Affective Relationships, Memories, and Social Connections

One example of this intertwining of dimensions is the role of cycle use in the affective relationship that a cyclist may have with their cycle. Indeed, Coleman argues that cyclists' previous cycling experiences and memories, especially childhood memories, contribute to their attachment to their cycle:

> Because a bicycle is one of the few things from childhood that is still potentially used in much the same way in adulthood, the experiential aspect of the user's attachment to their bicycle over time is a powerful generator of memory and emotion. The amalgam

> of memory, emotion, and continued embodied use factors into the way in which an individual becomes attached to their bicycle and uses it to help create their personal and social identities. (Coleman 2015: 123)

The idea that cyclists' embodied past experiences fuel their attachment to their cycle is shared by several respondents, who mention the length of ownership of their cycle as a sign of its value to them. Cyclists appear to appreciate and value their cycle even more when they can remember using it in the past and when it is integrated into past memories that are dear to their heart. They also tend to care more about their cycle when it reminds them of their relationships with other people around them; indeed, when asked to describe their cycle, many cyclists mention the people they bought it with or for, the people they ride it with, and/or its status as a gift (and the special attention it represented). While cycles are often described as means of individual transportation, they also allow for the intertwining between the social and symbolic aspects of cycling, actual use, and the affective link between cyclist and cycle. Examples of the social uses of cycles as they are valued by cyclists can be found in Table 3.8.

Now 18 years old, it's somewhat old-fashioned, but it continues to work well, and I am too sentimental about it to give it away."
"Companion of my high school and study years, and now of my active life, it means a lot to me."[101]
"It is a very recent birthday gift and I am so in love with it"[102]
"I've got a bike, you can ride it if you like, I'd give it to you if I could but I borrowed it."
"Road bike, frame manufactured in 1992 (Apollo brand) with 2nd-hand components that a friend assembled for me as a gift"

[101] « Compagnon de mes années de Lycée et d'études et aujourd'hui de ma vie d'actif, j'y tiens énormément. »
[102] « C'est un cadeau d'anniversaire très récent et j'en suis trop in love »

"A tall hybrid bought for my mum, very beautiful, a bit too precious for the street."[103]

Table 3.8 - Affective link with the cycle and its social uses

Social Categories of Use

Cyclists very often describe their cycle in terms of the type of activity for which they use it, which can sometimes correlate with established cycle categories: a road cycle for leisure or sport cycling on roads, a mountain cycle for cycling on trails, a city cycle for urban utility cycling, a hybrid cycle for a bit of everything… However, these categories, which may have fitted into the instrumental dimension of the model of material possessions, are also socially co-constructed. In other words, they are co-defined by the practices of cyclists and the cycling industry in a way that is well described in Paul Rosen's study of the mountain bike (Rosen 1993). Cycle categories act as scripts: tacit messages inscribed within the design of a technical object by its designer or producer about its intended use or meaning (Akrich 1992; Rommes 2002; Baker 2018). Scripts are sometimes explicitly articulated in the name of a category (mountain cycles, for example, are intended for use on hilly terrain). Sometimes scripts are understood more implicitly by cyclists, reinforced by the marketing activities of cycle manufacturers and retailers, as well as by cycle shop employees (who work closely with cycle manufacturers). This separation between categories helps cycle retailers meet their goals by providing some clarity to their customers, who, regardless of their personal circumstances, will be able to find a cycle with an attached script associated with their lifestyle or desired activities. It also conveniently justifies the purchase of several cycles (one for each use case) for keen cyclists, through small differentiations in scripts (see Figure 3.2).

[103] « Un grand VTC acheté pour ma maman, très beau, un peu trop précieux pour la rue. »

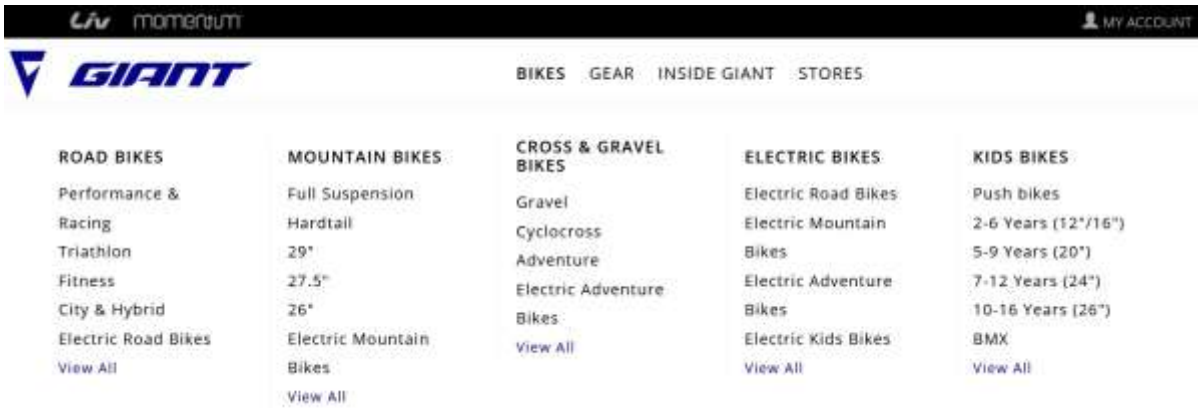


Figure 3.2 - Menu of the website for Giant, one of the most famous cycle manufacturers and retailers (June 2022)

It is thus quite common for cyclists who own multiple cycles to allocate different activities to each of them. For instance, some cyclists clearly separate the cycles they use during the work week from those they use on weekends and holidays. In these cases, the different designs and characteristics of cycles not only structure and help demarcate activities from each other, but may also contribute to defining their owners' relationship with differently demarcated periods of time.

The social impact of the constitution and spread of cycle categories is illustrated by the recent appearance of two very similar categories, namely "gravel" and "cyclocross": many cyclists struggle to differentiate between them, since they are both types of cycles with wide tyres (like mountain cycles) and drop handlebars (like road cycles). This widespread confusion has led many cycle manufacturers, retailers, and cycling media outlets to publish explanatory texts[104]. The massive market success of gravel cycles led to a certain amount of debate as, nevertheless,

[104] For instance, read the website of Décathlon (URL: https://conseilsport.decathlon.fr/gravel-et-cyclo-cross-quelles-differences), Cycling Weekly (URL: https://www.cyclingweekly.com/news/gravel-vs-cyclocross-bike-what-is-the-difference-463580), Bike Radar (URL: https://www.bikeradar.com/advice/buyers-guides/gravel-bike-vs-cyclocross-bike/), Bike Adviser (URL: https://thebikeadviser.com/cyclocross-vs-gravel-bike/), and BikesFaq (URL: https://bikesfaq.com/whats-the-difference-between-a-gravel-bike-and-a-cyclocross-bike).

many cyclists regarded them as yet another unnecessary trend[105].

Although these scripts can be seen to frame the way cyclists use their cycles, they are also a means of structuring a certain set of affordances. Affordances are relational constraints that delimitate the possibilities of interaction between certain actors, including material objects (Gibson 1979).

In the case of the cycle–cyclist relationship, the possible meanings and uses of cycles are not infinite: while affordances include, for instance, the possibility for cyclists to ride to a range of places, lean on them, or hang clothes on them, a cycle cannot satisfy someone's hunger like a piece of fruit would, fly like a plane or a kite would, or be wrapped around someone's body to keep them warm as a blanket would. Moreover, the different models of cycles also have specific affordances: for instance, two-wheeled bicycles cannot stay balanced upright without the use of a kickstand or other suitable prop, while three-wheeled tricycles can. Mountain cycles introduced wide gear ratios into the cycling market; before this, it was very difficult for cyclists to ride up some steeper hills, whereas now, the same cyclists can do so with comparatively less effort by using a mountain cycle. Affordances condition the scripts that are carried by technical objects, as well as the actual uses made of them, even outside of these scripts (Hutchby 2001).

Independently of affordances, a social context may encourage the rise of new categories of cycles. This is for instance the case for the "pub bike", a category of cycle that was mentioned only by Melbourne respondents (and not at all by Lyon cyclists). According to these responses, a pub bike is a very low-quality cycle that can stay parked in exposed areas for extended periods of time with a low risk of being stolen. It is quite striking that the activity of going out for drinks, which is popular both in Lyon and in Melbourne, is associated with an entire category of

[105] On the forum singletrackworld.com, one of the hundreds of thousands of discussion threads on this topic, entitled "Gravel bikes, why?" (published in 2020, URL: https://singletrackworld.com/forum/topic/gravel-bikes-why/), prompted 95 replies, several of which expressed fatigue with this frequently occurring debate. This controversy also appears in the title of the video of the popular cycling influencers, Global Cycling Network: "Gravel: who's to blame?" (URL: https://www.globalcyclingnetwork.com/video/who-s-to-blame-for-gravel-bikes-uncovering-the-history-of-cycling-s-second-biggest-controversy).

cycles in one country, but not another. This may be related to differing alcohol consumption practices, as well as to the overall higher value and prices of cycles in Melbourne, which may justify additional wariness regarding the threat of theft.

With regard to the affordances of diverse types of cycles, cyclists redefine a range of possible uses beyond existing cycle categories and scripts, bending them to suit their own lives, needs, and cycling experiences. Indeed, cyclists in many cases either do not choose or cannot afford to own one cycle for each type of activity in which they engage.

Many cyclists use cycles for a different purpose than that advertised by professional cycle retailers. While some of them do so out of lack of choice, for many of them this is a conscious decision: for instance, although hybrid and city cycles are usually recommended for everyday commuting, a cyclist faced with a long commute may choose to use a road cycle instead. Furthermore, mountain cycles, initially designed for and sold to cyclists aiming to climb mountains and ride rough, hilly terrain, have a wide gear range, which is a useful resource when it comes to pulling a heavy load such as a trailer. Scripted categories are accordingly replaced by new categories, generated through practice – in short, by the cyclist's actual use of their cycle following progressive adjustments made in the course of their daily experiences. Table 3.9 summarises the diverse uses that cyclists make of different categories of cycles.

Thus, the main categories of cycles, which are believed by many cyclists and mechanics alike to structure the instrumental dimension of cycling practices, are themselves the product of a negotiation between different social groups; instrumental and social uses of the cycle constantly overlap in complex ways. The distinction between these categories, inherent to the model of material possessions, is thus challenged and contested by a study of these categories as they are designed and used in practice.

"Electric cargo bike, work horse."
"I have five... racing, training, commuter, mountain, single-speed"
"E-bike: main commuter. Hybrid: former commuter, used today to go places and

park for a long time (for instance: swimming pool, groceries). Road bike: occasional sports and touring use."[106]
"I ride one of my bicycles 6 days a week and I go on 2-week overseas holidays with my touring bike."
"A beautiful gravel bike, a bit heavy, that I don't really use for gravel anymore, but that is a bit too beautiful for daily trips."[107]
"A decent road bike, good for long commutes but not good enough to race/compete"
"Road and commuter are immaculate. Mountain for towing double kids' trailer"

Table 3.9 - Cycle categories and actual uses made of them by survey respondents

Assembling Dimensions of the Cycle–cyclist Relationship

The two examples given above – how cycles are used in a social context, and the scripted categories of cycles – demonstrate that the concept of distinct dimensions of cycle use is incoherent in practice. The strong overlap that exists between these dimensions is not only context-dependent (as illustrated by the specific situations in which a cyclist owns a cycle that is both useful and symbolically valued), but also embedded within the nature of technical objects, as argued by Miller:

> The object form which has always been seen as most clearly exemplifying the utility principle is the tool. [...] This notion of the instrumental object as an extension of being should not, however, be reduced to a relationship of efficiency. [...] It is the object's relationship to the social group which is crucial, rather than its ability to perform a transformation of nature under the sign of utility. The artefact's capacity to separate itself from the immediacy of a relationship embodied in the concept of utility is most evident

[106] « Vélo à assistance électrique : vélotaf principal. Vélo tout chemin : ex-vélotaf, aujourd'hui utilisé pour me déplacer et stationner longuement (exemple : piscine, courses alimentaires). Vélo de route : usage ponctuel sportif et randonnée. »

[107] « Un beau gravel un peu lourd, qui ne me sert pas encore vraiment pour le gravel, mais qui est un peu trop beau pour les trajets quotidiens »

> in the manner in which it is used for precisely the opposite function, that is, to separate the individual from productive activity. Although one means of detachment from the world is a spiritual asceticism based upon a lack of material possessions, more common has been the desire to accumulate luxuries and objects which themselves signify the lack of any need to engage directly in productive labour. (Miller 1987: 117–118)

In a society where work and labour are devalued, the symbolic value of an object depends strongly on its instrumental value. The separation between instrumental, affective, and symbolic dimensions becomes artificial in this context.

Artificial separation between dimensions creates a false distinction between the social and technical aspects of a material object; this is why a study of technical and material objects should consider the co-constituted nature of the social and instrumental dimensions. This is the argument put forward by Albena Yaneva:

> Presently, the object is grasped in two different ways: either through its intrinsic materiality (something that would define it as material, real, objective and factual) or through its more aesthetic or "symbolic" aspects (that would define an artefact as social, symbolic, subjective and lived). ANT [(Actor-network theory)] helps us escape this modernist division. Suggesting that matter is absorbed into meaning, that design is in the world as the ANT terms script and prescription imply it, design studies could engage in analysis of how materiality from one side, and morality, ethics, politics from the other, are to coalesce in design. (Yaneva 2009: 283)

Yaneva thus offers a vision of design studies that stands in opposition to a separation between instrumental and social dimensions. In this way, she emphasises the intertwining between material objects, the experience of their uses through practices, and the social reality in which these practices take place. The essential aspect of this intertwining is material interaction, something that I will return to later in this thesis; before that, I will address another shortcoming

of the model of material possession, namely its inability to address cycling and repair practices simultaneously.

2.b. A Common Cycle: Aggregating Repair and Cycling Practices

Another shortcoming of the model of material possessions is that it does not allow for an articulation of the integration of cycle repair and cycle riding, which are very different practices.

This distinction is made obvious in the movie Raoul Taburin (2019), directed by Pierre Godeau. The main character is a cycle mechanic who struggles with the fact that he cannot himself ride a cycle, something that his friends and family are unable to imagine is possible. This movie, and the comic by Sempé on which it is based, question the link between repairing and cycling. Must these two activities necessarily be linked? What is the link between riding and repairing a cycle? This section explores these questions, focusing on the cycle as a link between different practices. I show that it is appropriate to group cycle repair and cycling together, as they are tightly intertwined in the daily experiences of cyclists.

One important contribution of the mobility turn in social science was its call for researchers to focus both on mobilities and on immobilities and "moorings" (Hannam, Sheller, and Urry 2006). In the case of cycling, studies of the cycle in movement are more widespread than studies of the cycle out of movement. However, researching cycle repair also requires attending to the cycle when it is not moving, along with the social implications of this state, since vehicles also transform their social environment outside of states of movement.

Existing research on the motionless cycle includes the studies of cycle parking and locking, and abandoned cycles, conducted by Jonas Larsen and Mathilde Dissing Christensen (Larsen and Christensen 2015; Larsen 2017). These studies showed that motionless cycles constitute the urban space in ways that cycle parking aims to order and pacify. A study of car parking also showed that motionless parked vehicles contribute to the creation and transformation of practices within time (Kurnicki 2022). The cycle as an object contributes to different cycling practices by forming assemblages with other elements (Cox 2019: 28): the street; a parking rack; a tree; a cycle stand; tools; a mechanic; a cyclist; a cycle lane; adequate clothing… Accordingly,

the cycle alternately becomes a cycle-in-movement, a cycle-in-parking, or a cycle-in-repair. However, it is still the same object that contributes to each of these different practices, even though it will be considered in diverse ways and in relation to different characteristics within each practice.

There is a clear link between repair and riding; despite the unquestionable difference between these two practices, they in fact feed each other. Indeed, survey results show that self-assessed ease with repair operations and frequency of cycle use are positively correlated among cyclists[108] (Figure 3.3), suggesting that it is frequently the same people who are at ease with both practices.

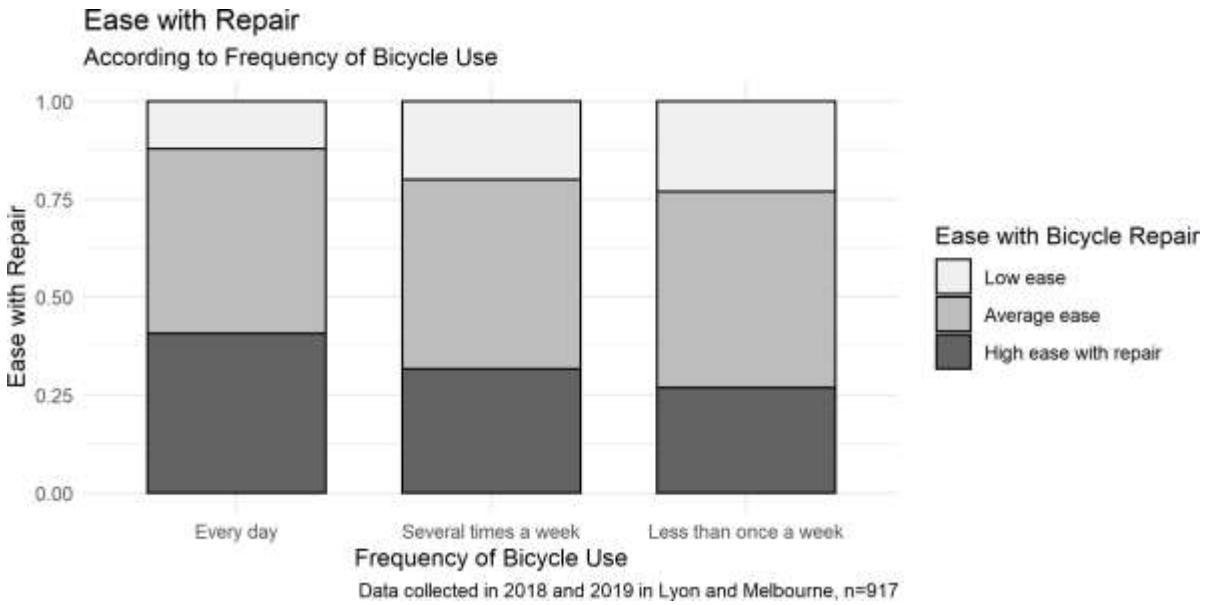


Figure 3.3 - Self-assessment by survey respondents of their level of ease with cycle repair according to their frequency of cycle use.

Cyclists who have owned their cycle for longer also report greater ease with repair on average. Cycling experience is correlated not only with repair overall, but also most repair and maintenance indicators. For example, frequent riders and people who have owned their cycle

[108] $\chi 2 = 15.84$, $p = 0.003$

for longer are more likely to regularly oil their chain or pump up their tyres. There is therefore an integration of repair and cycling practices within the lives of cyclists themselves.

The following subsections dive deeper into the lived experience of cyclists in order to explicate the link between cycling and repair, along with the intertwining between both these practices, as made possible by the common centrality of the cycle itself.

The Diverging Uses of a Cycle

The model of material possessions implies that a cyclist's relationship to the cycle will remain stable, regardless of the practices in which they engage. However, cycling and repair are two distinct practices: the cycle drastically changes its role and function according to the practices it is engaged in.

While cycling involves movement in space, cycle repair and maintenance usually occur in one particular space (often a cycle shop or workshop, or the cyclist's place of residence). Moreover, while cycling is an activity in which the cycle is used as a tool for a given objective, cycle repair and maintenance require the use of other tools to promote the cycle's well-being. A cycle that does not function as desired is an impedance to the successful realisation of a cycle ride, while also being the necessary condition for cycle repair. On the contrary, a functional cycle removes any reason for repair, but creates all the possibilities for riding.

The attributes that cyclists typically seek in a cycle (speed, lightness, comfort, ease of handling, etc.) are very different from the ones that mechanics might prioritise (easy access of parts for handling, wide availability of spare parts, compliance with standards, ease of adjustment and durability, etc.).

It may thus occur that attributes of a cycle that greatly improve a cyclist's riding experience, or that are considered to improve its quality, in fact make it more difficult to repair. This may for instance be the case for electrically assisted cycles, since the improvements in riding comfort typically result in increased repair complexity.

Many other characteristics that improve riding comfort may make repairs more difficult. For example, one Lyon mechanic argues that two types of cycles popular in the city – Dutch cycles and those previously used by post office workers (and often sold to regular cyclists after a few years of use) – are in fact very difficult to repair:

> *I don't like post office bikes. I have assembled and taken apart many of them. They are made and assembled to have the least breakdowns. But as soon as you get a puncture… It's so hard to remove the back wheel that they made special inner tubes, you know, open inner tubes, they are not a closed loop, so you open them, and then you fit one end inside the other, and it gets inside itself… But me, I don't like to fit these inner tubes, I prefer fitting normal ones. But fitting a normal tube on a post office bike, oh, it's absolute hell! You need to take everything apart on one side, and then the other, you need to remove the mudguard, take out the gears, often you must remove the cable and then fit it back, it's a real chore actually.*[109]
>
> Val, shop owner and mechanic, Lyon

As this mechanic argues, some cycles that are designed for the comfort of the cyclist, and thus for reducing the chance of breakdown, may be harder to repair. One way to prevent breakdown is to protect a specific part from dust and rust by covering it; however, this also reduces a mechanic's ease of access to the part during repair. The addition of items that increase the comfort and ease of riding (such as mudguards) can accordingly sometimes add extra steps to an already tedious repair process.

This difficulty of repairing "special" cycles is however contested by another mechanic who has

---

[109] « Les vélos de la Poste j'aime pas. J'en ai monté et démonté plein. C'est des vélos qui sont montés et qui sont faits pour pas avoir de panne, le moins possible. Par contre dès que tu crèves… c'est tellement la merde d'enlever la roue arrière qu'ils ont fait des chambres à air spéciales, tu sais les chambres à air ouvertes, il y a un boudin, c'est pas un truc fermé, donc t'ouvres, ça rentre dans lui- même… Mais j'aime pas mettre ces chambres à air moi, j'aime mieux mettre des normales. Mais si tu veux mettre une chambre à air normale sur un vélo de la poste, oh, c'est une galère ! Il faut démonter tout d'un côté après faut démonter tout l'autre, faut enlever avec le garde-boue, désarmer les vitesses, souvent faut enlever le câble et après faut le remettre, en fait c'est une vraie tannée. »

had the opportunity to work on them. Pauline, who has worked for the Lyon shared bikes company Velo'v, found to the contrary that cycles like these (designed to never break down) were actually very easy to repair using the right tools and processes – so easy, in fact, that it could sometimes get boring:

> *The goal is optimising time, so you've got great processes: you put your tools away in such a way that you can access them in a specific order for a repair, and that's it, after this you repair in a certain way. They also have this system for adjusting the derailleur and the brakes in no time, we almost never replace the cables. They are always made in a way that is extremely protected. Usually you touch a couple of screws and it's good to go again. Everything is designed so that it is quite easy.*[110]
>
> Pauline, mechanic, Lyon

Another aspect of cycling experiences that contributes to the difficulty of repair is the quest for aerodynamics. Cycles designed for speed, or for a sleeker appearance, may be more difficult to repair; for example, as in the case of gear and brake cables being routed inside the frame, which may add considerable time to the repair process. The quest for aerodynamics and minimised weight may also contribute to the development of materials that are very light and capable of taking very specific shapes, but are also more difficult to repair: carbon frames, unlike aluminium or steel frames, are known to be almost impossible to repair when they crack.

One mechanic discussed the widespread use of road cycles in Melbourne, which he finds inadequate, since these types of cycles require very frequent and specific maintenance:

> *Most of the commuters ride road bikes. And sometimes, you look at some bikes and you think… if, in car terms, you're driving an F1 car to get to work, it's ridiculous. But they*

[110] « Le but c'est l'optimisation du temps, donc du coup tu as des super process là-dessus, tu ranges tes outils d'une telle manière que tu puisses les avoir dans tel sens pour faire telle mécanique et puis voilà, et derrière tu procèdes de telle manière. Et surtout ils ont tout un système pour pouvoir régler le dérailleur et les freins en deux temps et trois mouvements, les câbles on les change quasiment jamais. Ils sont toujours faits pour que ce soit extrêmement protégé. Normalement tu touches deux vis et c'est bon, ça repart. Tout est fait pour que ce soit assez facile. »

like it. And things wear out more quickly and break more quickly, because they're not designed to be ridden like that, they're designed to be serviced everyday by a mechanic on the race.

Phil, mechanic and owner, Melbourne

Overall, the same cycle that is a pleasure to ride can be a nightmare to repair – or, on the other hand, a cycle can be a pleasure to repair independent of what it feels like to ride it. For instance, one mechanic told me of the excitement he felt when repairing a cycle so old that he had never seen another cycle with similar components – at that moment, repair felt like an adventure to him, even though he admits that the components were also so old that the result may have been unsatisfactory in the end:

I spent a whole afternoon repairing a tandem, a 1935 CPN. I'm sure that this one was used for the first ever paid holidays. Back then it was very common, but today it is an oddity. But I still talk about it – I did this thing up, I fitted new tyres, I adjusted the gears, I really was very happy. The derailleur did not have springs, it was fitted on a helical axle. I had no idea something like that existed, it was fun. The cable system was a continuous cable. They don't do this stuff anymore! Yeah, it's a good memory.[111]

Rémi, mobile mechanic, Lyon

Repairing and riding a cycle are thus two very separate practices, for which one particular cycle may be more or less suited. Despite this, there are strong links between repair and riding, links that are embodied in the cycle itself. The following subsections further explore these links and the ways in which they operate.

---

[111] « J'ai passé tout un après-midi à réparer un tandem, un CPN de 1935, je suis sûr qu'il a fait les premiers congés payés celui-là. À l'époque c'était plus courant alors qu'aujourd'hui c'est une curiosité. Mais j'en parle encore, j'ai retapé tout ce truc-là, j'ai monté de nouveaux pneus, j'ai reréglé les vitesses, j'étais vraiment super content. Le dérailleur n'avait pas de ressort, il était monté sur un axe hélicoïdal. Je savais pas du tout que ça existait, c'était marrant. Le système de câble, c'était un câble continu. Ce truc ça ne se fait plus ! Voilà, c'est un bon souvenir. »

Co-experiencing Cycling and Repair

As argued in the previous chapter of this thesis, the way in which a cycle is repaired, maintained, transformed, and adjusted depends on the actual uses that are made of it. Habits and meanings of repair and maintenance fluctuate according to individual experience, and the assessment of the cycle's condition is strongly affected by the socio-economic background of the cyclist and their previous experience with riding and repairing: several cyclists and mechanics could assess the same cycle differently. In this context, the riding experience is central to the repair experience.

Repair and maintenance are embedded into the social lives of cyclists whose personal preferences, daily habits, and physical abilities determine the type of repair and maintenance in which they wish to engage. For example, Julia wanted to have her handlebars replaced, since her way of life and desk work places a lot of stress on her back, something that is exacerbated by her long ride to work. In this case, the repair is made necessary by the daily life and the riding habits of the cyclist. Julia is willing to make a lot of effort to adjust the cycle that she is going to ride every day.

The riding experience of cyclists thus transforms the way in which they perform repairs or have them done by professionals. A mechanic may also ask a cyclist about their riding habits in order to understand the nature of a repair and what might be needed. This is, for example, the case for one Lyon mechanic, who takes pride in being able to guess how a breakdown occurred, and thus to more accurately gauge the price of a repair:

> *Some youngsters show up with the dad or mum, and the mum says: "The bike doesn't work! It's under warranty, you've got to fix it." I ask the young guy, "Is it your bike?" "Yeah, it is." "And what happened here, young man?" I have a look, the bike's got marks on it in certain locations. You can see whether it fell down, if there are marks from skidding and all that. "You fell and landed here, am I right?" "Yeah, I did, how did you guess?" "Well, it's obvious! And what about skidding?" And then you see the smile. See, madam, we say "skidding", and he smiles. And then we're in the right place. They try to*

trick me, but when you've got professionals in front of you, you can't do it.[112]

Renaud, mechanic, Lyon

In many ways, repair practices are informed by the cyclist's riding practices – a broken brake does not mean the same thing for someone who commutes a short distance every day as it does for someone who rides competitively, or someone who wants to ride for a long distance on a holiday. When mechanics ask cyclists how often they ride, the answer provides them with clues about what repairs are needed and which maintenance operations may be useful in anticipation of the riding that will be done in the future.

Reciprocally, for some cyclists, considerations of repair and maintenance can also inform the way they ride. For example, Bill is a cyclist who keeps an eye on the roadside for old cycles from which he can salvage parts. His experience of his urban environment, and of moving through the city, is therefore transformed by his interest in repair:

> *As I'm riding, if I see a bike that's been thrown away, I'll stop and think, "is that the same as the one I have at home, could I swap something over?". Yeah. And so that's how I would find, uhm, a worn tyre that I could use to reinforce another one, or I'll assemble parts and use them to make trailers to pull my shopping trolley.*

Bill, cyclist, Melbourne

Besides this rather unusual example, there are many ways in which riding practices are informed by repair. First of all, it is obvious that the riding experience is strongly impacted by the condition of a cycle, which is itself a consequence of the successive repair and maintenance operations

---

[112] « Il y a des jeunes qui arrivent avec le papa ou la maman, et la maman elle dit "le vélo il va pas ! Il est en garantie, faut le changer". Je demande au jeune, "il est à toi le vélo ?". "Oui il est à moi". "Il s'est passé quoi là jeune homme ?". Je regarde, en fait le vélo il a des marques à des endroits. Tu vois s'il est tombé, tu vois s'il a des marques de dérapage et tout ça. "T'es tombé là il me semble, non ?". "Ah oui, comment tu le sais ?" Bah ça se voit ! "Et les dérapages ?". Et là tu vois le sourire. Vous voyez madame, on dit dérapage et il sourit. Et là on est dans le bon. Ils essaient de m'avoir mais quand tu tombes sur des professionnels, au bout d'un moment tu peux rien faire. »

conducted upon it; a lack of repair, or a bad repair, may lead to cycle components rubbing against each other, or to other effects that could make it much more difficult to ride the same distance. Furthermore, it is quite common for cyclists to adapt their riding to their estimation of their cycle's condition. For instance, cyclists who ride a cycle with broken or wobbly gears may avoid changing gears, as they know from experience that doing so would make the chain come off. Cyclists in this situation accordingly anticipate and avoid hilly areas because they know that their cycle is not in good enough condition to help them accomplish a steep climb. Thus, riding can be impeded, or made entirely different in its form, because of repair practices and how they are understood by the cyclist. Similarly, some cyclists will avoid certain routes because they are afraid of getting a puncture.

Another situation during which cycling and repair practices merge with each other is the situation of diagnosis during the ride. Indeed, it is quite common that experienced cyclists, while riding, will unconsciously monitor the condition of their cycle, identifying certain sounds, vibrations, and unusual movements as indicating a potential need for repair. In this situation, riding becomes itself a form of repair, or, at least, riding and repairing occur simultaneously. The cyclist's sensorial experience of riding a cycle is thus informed by their repair and maintenance skills. In this case, the diagnosis occurs within the cycle–cyclist hybrid, defined above as the cycle and the rider functioning as a unit. Cyclists experienced with repair and maintenance often diagnose mechanical issues while riding and can anticipate a mechanical issue before it occurs. This diagnosis is based on collected sensory information, as illustrated by Samuel:

> *Usually the first thing is hearing the chain, you can hear the chain squeak, yeah, and then you check the bike over again. And [...] when I'm riding, I'll listen to it, so you can usually hear when a spoke is loose, it goes "queek, queek" – so then I'll just flick the spokes, just to listen to that, to adjust... keep the spokes tight.*
>
> Samuel, cyclist, Melbourne

Samuel uses the sounds that he hears while riding (a squeaky chain or loose spokes) to help him identify which cycle part needs to be repaired or maintained.

Same Cycle, Same Values

One final point in common between riding and repair is that, for some cyclists, riding and repairing a cycle go hand in hand in contributing towards a better society. These cyclists associate both cycling and repair with the same values that are important to them. This is a phenomenon frequently observed in self-repair workshops (Rigal 2020). In many cases, mechanics believe cycling to be a very valuable practice, to which they are happy to contribute through their work:

> *People do not always realise it, but being a bike mechanic is a beautiful occupation. Car mechanics have been the focus for many years. But in the current times, when people say they care about the environment and all… bike mechanic is a beautiful occupation. And it makes me happy. Already, while cycling, we get wind in our face, but we are fit and healthy – people who cycle are rarely late, except if they get a puncture. Cycling is also a mindset.*[113]
>
> Renaud, mechanic, Lyon

Environmental values are often ascribed to cycles. Cyclists and mechanics both consider that repair contributes to sustainability, which is one key aspect of cycling practices:

> *The whole thing with the industry of cycling is it's meant to be a sustainable industry, so, sustainable transport, that kind of stuff. The reason why we've got such a good reputation is that I don't sell people things that they don't need. You know, people come in to see me and say, "I think I need new tyres", and I'm like "no, you've got a few more months on those". Because for me it's waste.*

[113] « Réparateur de vélo, on se rend pas compte mais c'est un beau métier. Les mécaniciens auto ont été bien mis en avant pendant des années. Mais avec l'air du temps, et puis les gens se disent écolo et tout… réparateur de vélo, c'est un beau métier. Et puis ça rend heureux. Déjà faire du vélo, on a le vent dans la gueule mais on est en pleine forme, les gens qui font du vélo sont rarement en retard, sauf s'ils crèvent. C'est aussi un état d'esprit le vélo. »

Sam, mechanic and shop owner, Melbourne

For some cyclists and mechanics, repairing a cycle is thus logically continuous with riding it, as both practices contribute to preserving natural resources. These two practices are thus intertwined in how they both work towards the same aim.

This intertwining of cycling and repair prompts us to reconsider the cycle–cyclist relationship. Although repair and cycling practices are different and follow different dynamics, they are nonetheless strongly linked. The ways in which a cycle is ridden and the ways in which it is repaired mutually constitute each other. This means that it should be possible to discuss both these activities simultaneously, while also acknowledging their separation, something that is made difficult by the model of material possessions.

2.c. The Evolving Cycle–cyclist Relationship

As an object produced from an assemblage of parts and accessories, cycles are objects that are in a constant state of flux, which is something that tends to be overlooked by the model of material possessions and other formulations:

> In certain cognate literatures such as transport geography, the status of mobility artefacts has remained unquestioned; positioned as already 'made up' and acting as neutral nodes in a given network (Ernste et al. 2012; Spinney 2010). (Spinney, Reimer, and Pinch 2017: 4)

By contrast, a focus on repair reminds us that cycles are not fixed objects, frozen in a fixed state, but rather continuously changing objects that are also transformed by the diverse uses made of them.

Table 3.10 presents some examples of cycle transformations as experienced by survey respondents. One way in which cycles can evolve is through the equipment that is added to them. Indeed, despite usually having little choice regarding the exact shape of the cycle frame,

cyclists often have the opportunity to add or replace accessories, which are for the most part easily detachable: handlebars, racks, mudguards, the seat, cassette and derailleur… For many, describing their cycle involves describing the many ways in which they have customised it.

Through customisation, cyclists can reject or subvert the predetermined categories of use discussed above, and instead create assemblages with features usually associated with a mixture of separate categories; in the street, for example, it is common to encounter mountain cycles with panniers or child seats, or city cycles with drop handlebars. Another form of customisation involves replacing cycle components with higher-quality ones, or introducing different functionality through DIY additions or the repurposing of standard components (Figures 3.4 and 3.5).

Figure 3.4 - A cycle with inverted handlebars, a transformation sometimes adopted by cyclists wishing to ride with a more upright posture than the one encouraged by the initial position of the handlebars

Figure 3.5 - Cardboard from a beer pack turned into a DIY mudguard

The cycle–cyclist relationship may also be transformed in the course of changes in a cyclist's life. Even without any intentional physical changes being made to their cycles, cyclists' uses and representations of their cycles may evolve as their cycling practices change. This can correspond to a physical transformation of the cycle that occurs in the course of everyday practices – for instance, when a cycle ages and becomes either dysfunctional or obsolete, at least in the opinion of its owner – or to a change in the cyclist's representations of what constitutes a good cycle for a particular activity.

"Utilitarian commuter – pannier racks, mudguards, and dynamo lights"
"A road bike with slightly wider tyres that makes commuting easier."
"A tourer that I have changed the handlebars on so as to sit straight up. It has 14 hub gears, belt drive, hub dynamo, and hydraulic disc brakes"
"It's a mountain bike bought in 1996 in Québec, that I use with slick tyres for riding in the city and for winter training."[114]
"It was an average mountain bike, but I enhanced it a lot: tyres, brake callipers, rims, brakes, which makes it perfect now."[115]
"Kalkhoff bought for €500 in 2015, for bike touring (like 500ks in 10 days) every year, and that I now use on a daily basis."[116]
"The perfect bike for getting started. If I continue to ride more than 100km per week I will purchase an upgrade."

Table 3.10 - Cycle categories and actual uses made of them by survey respondents

Of course, cycle repair, along with the regular interventions made by cyclists and mechanics on cycles, are among the main forms that this transformation of cycles can take. Repair and cycle riding, as forms of material interactions, transform both the cycle and the cyclist.

2.d. Using the Cycle, Making the Social

Faced with the limitations of the model of material possessions, this study aims to establish a new theoretical standpoint from which a fuller understanding of cycle and repair practices can arise. Since both cycling and repair are practices based on the cycle–cyclist interaction, I next

[114] « C'est un VTT acheté en 1996 à Québec que j'utilise avec pneus slicks pour la ville et entrainements d'hiver »
[115] « C'était un VTT moyen mais je l'ai grandement amélioré : pneus, étriers, jantes, freins, ce qui fait qu'il est parfait maintenant »
[116] « Kalkhoff acheté 500€ en 2015, pour des randos à vélo (genre 500km sur 10 jours) tous les ans, et que j'utilise maintenant au quotidien »

turn to theoretical avenues that focus on the interaction between individual and object.

Theories of Material Interaction

Albena Yaneva is one of the researchers who emphasises the centrality of material interaction. Specifically, she argues that social norms and links are performed through the use of material objects:

> The objects from my university mornings [...] do not stand for social forces and divisions, nor do they symbolically represent the university's order, hierarchy or divisions of labour; rather, they *perform the social* as we use them, and connect us in a new way with fellow colleagues, students and university administrators. (Yaneva 2009, emphasis by author)

Here, Yaneva refers to actor–network theory, which stipulates that material objects and individuals are jointly responsible for the course of an action. ANT first emerged from the field of science and technology studies, which explicitly aims to unravel the diverse social implications of technology. The focus on object and technology use as central to the social world arose logically from this initial intent. One ANT theorist, Bruno Latour, even declared that artefacts have the capacity "to construct, literally and not metaphorically, social order", and that they are "in large part the stuff out of which socialness is made" (Latour 2000: 113). According to Latour, by focusing on technical objects, science and technology studies questions and renews traditional sociological approaches, since this theoretical move leads to a redefinition of what exactly the social is. Science and technology studies is thus a fruitful theoretical field for discussing both cycling and repair.

Whereas, in the course of cycling, a cyclist uses a cycle, quite the opposite is true during repair. It could in fact also be argued that the cycle uses the cyclist in order to move. This debate regarding the agency of inanimate and technical objects has been renewed by ANT researchers, some of whom have highlighted the agency of inanimate objects in social organisation (Callon

1986). However, as suggested by Bijker and Pinch (2012, cited in Cox 2019) the question of the agency of technical objects is secondary, as actor–network theory demonstrates that what matters most is the effect of the constitution of an assemblage between people and things within action (Akrich and Latour 1992). The key question is not who exactly is responsible for a specific action, but rather how this action comes to arise from the assemblage of different elements.

Another way to frame this focus on material interaction is through the concept of "articulation", first introduced by the French anthropologists Marie-Pierre Julien and Céline Rosselin (Julien and Rosselin 2003). Through their work, these two researchers made important efforts to shift focus onto material objects and material culture (Julien and Rosselin 2005; 2009). In more detail, they argue that apprehending only the symbolic social meanings or technical uses associated with a material object has the effect of parcelling this object out, extracting it from its context, and thus preventing the full understanding of its integration in a given society and culture, since "an object is more than the sum of its components" (Julien and Rosselin 2003: 6). These authors consider that material interaction, namely the technical gestures and human action used with and on material objects, are the site at which different dimensions of the object come together. It is within practice that symbolic, affective, and instrumental (general or embodied) aspects articulate with each other, sometimes in contradictory or unexpected ways.

A similar role is given to material interaction within social practice theory, or SPT (Shove, Pantzar, and Watson 2012). This theory also defines action as the first element of the social. The term "practice" emphasises the fact that such actions are often repeated and habitual for the people who perform them. Like ANT, SPT contributes to undermining the conception that individuals act in accordance with pre-existing social representations (Reckwitz 2002). The assumed focus on individuals as the only relevant actors, and on society as a existing prior to, and outside of individual interactions, is strongly questioned by both theories. SPT decentres individuals by designating them as "carriers" of practice, highlighting the fact that it is only when they are assembled with specific elements of practice that they can contribute to its realisation. These elements of practice are identified as falling under three categories: materials,

competences, and meanings. Once again, SPT assigns fundamental importance to material objects:

> A key feature of our own approach is the emphasis we place on the constitutive role of things and materials in everyday life. (Shove, Pantzar, and Watson 2012: 9)

SPT is thus aligned with ANT in arguing for the idea that "agencies and competencies are distributed between things and people" (Shove, Pantzar, and Watson 2012: 10; Sahakian and Wilhite 2014). Indeed, it assigns the same importance to interactions between people and objects as to interactions between people and people (Reckwitz 2002). SPT allows for the theorising of consumption, use, and innovation as three forms of material interaction, and three interwoven aspects of material practices, which has contributed to its increasing popularity in the field of sociology of consumption (D.M. Evans 2019). Accordingly, it presents the cycle itself as successively contributing to the practices of cycling and repair, according to the context, meanings, and material elements with which it is assembled (Spotswood et al. 2015).

To avoid the pitfalls of the model of material possessions when theorising both cycling and repair, it is thus important to focus on material interactions. As an example of such a focus, I will next present a study of the practices of vintage cycle riding.

Vintage Cycles: Between Representations and Action

The interest of this focus on material interaction appears through studying the case of vintage cycles. While I have briefly described the phenomenon of vintage cycles earlier in this chapter, I will now focus more closely on some practices in which vintage cycles are involved, since, in my opinion, these practices demonstrate the way in which material interaction articulates the different dimensions of the cycle–cyclist relationship.

One person I had the privilege to interview in Melbourne is Gary, a volunteer at the local community workshop. Gary's interest in cycle repair was sparked by his desire to own an old cycle, which he would sometimes ride while wearing outfits from the 1920s:

I said, "we should both get a fixie, one day, and just, you know, ride around Brunswick and you know, hang out in a few places and display our bikes". We made an arrangement, and one day I opened the door: he had like a waistcoat, an old tie, pants, he's got a big beard anyway, and his sleeves were rolled up, and he's got this old rusty bike from the 1930s, it looked like he had found it in the river, and he said "oh, hello, old chap!" [laughs] I was laughing my head off, and I thought, I don't think he gets where I was going with it, but… I like it, you know! So we started doing that, and I found an old bike too, at the local tip.

Gary, community workshop volunteer, Melbourne

Gary and his friends created a social club to meet regularly and organise scavenger hunts that have a historical aspect to them. These involve hopping from one pub to another, dressing up, and riding vintage cycles around town, similar to British "tweed rides" (Oddy 2018). These events are also an opportunity to learn about the history of the neighbourhood in which they occur. A YouTube video by Cam Bisley[117] shows the group in a pub, displaying their vintage outfits, which they had purchased second-hand or inherited from their great-grandparents. In the video, event participants marvel at the surprise they read in people's faces in the street: some were asked whether they were filming a movie and whether it was possible to take a picture with them. Cycles are integral, in Gary's opinion, to the reconstitution of the scene: since some alcohol is consumed during the event, after a certain hour, participants are encouraged to walk rather than ride their cycles. At this point, the cycle becomes "a prop": whether people are riding it or not, it is essential to the historical reconstitution.

This use of old cycles for leisurely historical reconstitutions of 1920s Melbourne life shows the symbolic power that cycles can exert on cyclists' perception of their self and identity. Riding an extremely old cycle and wearing vintage outfits allows participants in these events to feel like they are part of another era, even though they will return to wearing their usual outfits and using

[117] Cam Bisley (cambees on YouTube), "Dry July with Cam – Knackers McShagbag and the missing mace". URL: https://www.youtube.com/watch?v=CTr9UZl-AZs

their regular modes of transportation the next day. In this context, the symbolic evocation of the past is achieved not only by riding an older cycle, but by a whole social practice: this consists in gathering several other people with the same interests and riding to certain locations with a specific historical meaning, and is also reinforced by many other accessories, outfits, and even hairstyles. In this context, the cycle is simultaneously a symbol of the past and the means of transportation used during the event – a means of transportation that transforms the rhythm of the event and the places that vintage enthusiasts can access, as compared to other historical-themed events during which attendants might drive cars or walk. Similarly, the use of cycles and alcohol consumption are two elements that were considered simultaneously by event organisers, who designed a route that would take both into account. In this situation, the symbolic, instrumental, and affective aspects of vintage cycles articulate together in the course of one specific action. Following SPT, it is possible to identify this action as realised through the assemblage of different elements, which include materials (old outfits, hairstyles, alcohol, vintage cycles), competences (knowledge or interest about a neighbourhood's history, ability to cycle) and meanings (shared interest in vintage cycles and in local history). The symbolic representations of vintage cycles shared by people attending these events are both necessary to, and a consequence of, the realisation of this event. The material interaction of riding vintage cycles in certain outfits and in the specific context creates and transforms social meanings and norms, while also redefining the social bonds between people.

Although most people's experience of riding older cycles differs from these vintage historical reconstitutions, the more common experience of riding an old cycle on a daily basis is also a material interaction that performs the social. Indeed, many cyclists enjoy being associated with an unusually old object that is in some way trendy. The attraction of old French brands in Melbourne is such that there are even some counterfeits circulating in the city (Figure 3.6):

> *There was a chance we had to say to the owner of the bike, that this frame is dead, because we can't get a new bottom bracket for it. But we were able to, and it worked up fine... That one was okay, because it was actually – I think this one has been made in Australia, not in France. It doesn't have any of the French, you know, bottom bracket or headset, but it looks similar, like it's the same paint and stickers and everything.*

Dan, mechanic and shop owner, Melbourne

Apart from the unusual situation of a counterfeit Peugeot cycle, it is not uncommon to find cycles sold in Australia that attempt to imitate an older design – for example, a plastic seat or handlebar grips that imitates the look of leather. One Melbourne survey respondent even described their cycle as "fake retro". These examples once again demonstrate the articulation between the social and symbolic value of a cycle and its instrumental dimension: some cyclists want a cycle that seems old, but matches today's technical standards, prices, and riding comfort.

Figure 3.6 – Australian Peugeot

The symbolic value of vintage cycles is also related to their rarity: cycles with designs that imitate old models but that are obviously recent may not be valued by connoisseurs, for instance. In some places where older cycles are affordable and easy to find, cyclists may not find much symbolic value in their use. Old cycles that do not work well due to having deteriorated over time may discourage cyclists who were initially attracted by their symbolic representations of vintage cycles; by contrast, other cyclists may accept some discomfort as a small price for the pride that they feel in riding a cycle that has, to them, a strong symbolic value.

French cyclists also appreciate the symbolic value of older cycles; for example, Aline expressed the following view:

> *I also have always had bikes for the style, because I find them beautiful [laughs], overall I like beautiful objects. My favourite was a bike from the 70s, it was a camper van bike, and it folded in the middle, with coaster brakes. It was stolen from me.*[118]
>
> Aline, cyclist, Lyon

Through riding her old cycle, Aline developed an affection for coaster brakes (operated by backpedalling, rather than via a lever on the handlebars), which is how that cycle was equipped. She then actively looked for a similar braking system in the next cycle she purchased (this time new). Aline associated this instrumental feature with the affective bond that she developed with her cycles, something that eventually transformed her overall instrumental relationship with cycling. Once again, this shows how the symbolic, affective, and instrumental dimensions of cycling assemble into the material interaction of riding.

This brief study of vintage and older cycles demonstrates the effectiveness of an approach based on material interaction, as this approach avoids many of the shortcomings of the material

---

[118] « J'ai toujours aussi eu des vélos pour le style, parce que moi je trouve ça beau [rit], globalement j'aime bien les beaux objets. Mon préféré, c'était un vélo des années 70, qui est de camping-car, qui était pliant au milieu, et à rétropédalage. On me l'a volé. »

possessions model when it comes to discussing cycling and repair. I have presented several of these shortcomings in this section, while also providing examples of the complexity of cyclists' lived experiences. The next section of this chapter goes further by introducing a political approach and a reflection on justice to the study of the cycle–cyclist relationship. It suggests a framework that allows for the assessment of cycling and repair as material interaction, which allows (or does not allow) the achievement of political aims.

3. Velonomy: Making the Cycle–cyclist Relationship Political

The previous sections of this chapter explored the model of material possessions and its limitations. Drawing on alternative theoretical approaches (science and technology studies, actor–network theory, social practice theory, and anthropology of techniques), I now propose that a focus on material interaction could be a more fruitful way of structuring our analysis of cycling and repair practices.

Through a focus on material interaction, it is possible to reflect on what is being achieved through the cycle–cyclist relationship. This is where questions regarding the ways in which this relationship could transform society – and, thus, the political aims that can be achieved through it – arise. This section accordingly aims to integrate the discussion of the political effects of these daily practices into the discussion of cycle repair and maintenance. This is done through introducing the concept of velonomy, which will be useful for understanding cycle repair and maintenance practices, along with the social consequences of these practices in French and Australian society, in the remainder of this thesis. I first introduce velonomy as it has been previously understood and discussed in activist circles and in academic research. I then elaborate on the political aspect of this concept through a discussion of the ideas of control and dependency. Subsequently, I focus on two operational aspects of velonomy, namely its processual nature and the fact that it is shared between different elements: the cyclist, the cycle, and the social environment in which cycling and repair occur.

3.a. Velonomy – From Activism to Science

Velonomy is a concept that considers the cycle–cyclist relationship to be intertwined with repair and maintenance. This term – which assembles the words vélo (cycle) and autonomy – was coined, and is regularly used, by French-speaking cycling activists, more specifically members of French self-repair workshops. This subsection further explores the definition of velonomy for these actors both within and outside of academia and practice. Despite its rather widespread use in certain circles, velonomy has not yet been thoroughly conceptualised. This section attempts to present and develop a more extensive definition of this concept that integrates both

its existing uses and meanings with the discussions of the cycle– cyclist relationship presented earlier in this chapter.

Velonomy for Cycle Repair Activists

The centrality of the term velonomy is evident in the charter of the national network of community workshops, l'Heureux Cyclage. Every member workshop is required to express its agreement with this charter[119]. The main section of this very short, one-page document states the following:

> L'Heureux Cyclage is a network of federated not-for-profit workshops that all pursue the following objectives:
>
> - Encourage everyday cycling practices.
> - Put abandoned bicycles back on the road, reuse bicycle parts, and recycle raw materials.
> - Exchange know-how in order to encourage cyclists' autonomy: velonomy.
>
> (Charter of L'Heureux Cyclage)[120]

Despite this central role of velonomy as one of the three core values of cycle repair activists, the term is often very loosely defined; this is all the more surprising because it is also rather widely used. For instance, in October 2020, the collaborative French cycle encyclopedia, Wiklou, listed 18 mentions of the terms "vélonomie" (velonomy) or "vélonome" (velonomous)[121].

Interestingly, despite its widespread use, the term "vélonomie" does not have its own page on

---

[119] https://www.heureux-cyclage.org/charte.html
[120] « L'Heureux Cyclage est un réseau fédérant les ateliers sans but lucratif ayant chacun l'ensemble des objectifs suivants:
- Favoriser la pratique du vélo au quotidien.
- Remettre en circulation des vélos délaissés, réemployer les pièces détachées et recycler les matières premières.
- Échanger les savoir-faire pour favoriser l'autonomie des cyclistes : la vélonomie. »
[121] These mentions are summarised in the Appendix of this thesis

Wiklou, which, by extension, indicates that it is not yet properly defined in the volunteer-managed encyclopaedia. As can be observed above, the meaning of velonomy is interpreted in very diverse ways by community workshop members. It is often understood as a synonym for "autonomy" and as the application of autonomy to cycle riding. In most cases, it is assumed that this autonomy can be achieved through learning cycle maintenance and repair skills . However, some definitions of velonomy also mention cycling and cycling practices in general. Overall, velonomy is seen as a goal for individual cyclists that community workshops must help them achieve. The example of "white gloves repair sessions" illustrates this: during these sessions, the volunteers are requested to wear white gloves, on which any bike grease would become noticeable; thus, they must give advice to members without touching the cycle themselves. These sessions aim to encourage volunteers to withdraw from the repair space in order to support members in taking the initiative and trying their hand at performing repairs[122].

Velonomy in Academia

The same heterogeneity that exists in common uses of the term velonomy can also be found in academic research, as academic uses of this term differ. Indeed, Mundler and Rerat define velonomy in a way that associates it strictly with cycle repair and maintenance skills:

> The bicycle's simplicity makes it possible to technologically master it and to acquire "velonomy", namely the ability to repair and maintain one's own mode of transportation.[123] (Mundler and Rerat 2018:6)

The definition provided by Batterbury and Vandermeersch is more extensive, and encompasses both repair and cycling itself:

> In France this is termed "vélonomie", or the creation of a self-sufficient or autonomous bicycle citizen capable of riding safely and keeping their own bike maintained.

[122] https://wiklou.org/wiki/Permanence_des_gants_blancs
[123] « Grâce à sa simplicité, le vélo est de surcroît technologiquement maitrisable et permet la « vélonomie » , c'est-à-dire le fait de pouvoir entretenir et réparer soi-même son mode de déplacement. »

> (Batterbury and Vandermeersch 2016:191)

This definition also uses the term "citizen", thus hinting at the political meanings of cycling; specifically, it implies that within the concept of velonomy, there is an underlying assumption that connects cycling and cycle repair to some form of social improvement. This third aspect of velonomy is the one emphasised by Alexandre Rigal, who argues that while the meaning of the term does cover the acquisition of cycling skills and the replacement of cars by cycles in the daily life of individuals, it also contains a third meaning:

> However, if this double meaning is shared by all of the workshops, it should not omit a third meaning, associating the bicycle with the value of autonomy and the opposition to the heteronomy associated to the car due to the restrictions to which the car driver is subjected: dependency to fuel, traffic congestion, cumbersome vehicle that restricts the fluidity of moving in the city as compared to the bicycle, difficulty to repair the vehicle, etc.[124] (Rigal 2020:6)

Rigal draws focus onto the political intent that underpins the creation of the term "velonomy" by cycling activists. The term not only describes the acquisition of skills by cyclists, but also situates this skill acquisition within the political context of "automobility", or the strong physical and social domination of the car (Urry 2004). This political aspect is a reminder that the development of cycling practices necessarily comes into conflict with a mobility system oriented towards the near-unilateral dominance of cars in urban environments.

The definition of velonomy that I have developed, and henceforth follow in this thesis, is aligned

[124] « Or, si ce double-sens est partagé par l'ensemble des ateliers, il ne doit pas laisser omettre un troisième sens, celui de l'association du vélo avec la valeur de l'autonomie et de l'opposition à l'hétéronomie rattachée à la voiture en raison des contraintes auxquelles l'automobiliste est soumis : dépendance au carburant, congestion, caractère encombrant de son véhicule qui entrave la fluidité de ses déplacements en ville comparé au vélo, difficulté pour réparer le véhicule, etc. »

with these key points. I thus define velonomy as follows:

"Velonomy is the level of autonomy of a cyclist; that is to say, the ease they show in riding their cycle, as well as in repairing, maintaining and adjusting it, in order to achieve their individual and collective goals".

This definition brings together cycling and repair as two facets of the material interaction between a cyclist and a cycle, while also allowing for a focus on what is achieved through this interaction.

3.b. Velonomy as a Political Relationship for Cyclists and Society

Another important aspect of velonomy is the political insight that it facilitates by introducing a social reflexion into the study of cycling practices. The model of material possessions does not allow for a political discussion of the cycle–cyclist relationship because it does not account for the consequences of cycling practices. This is also the case for other forms of theories of material interaction. For instance, in the frame of consumption studies, the development of practice theory has contributed to de-emphasising environmental inequity and political approaches (D.M. Evans 2019). By contrast, mobility practices vigorously and repeatedly raise questions regarding justice and equity (Sheller 2018). Mobility practices are restricted and costly; they are the site of many restraints, with some people being forced to move while others lack the opportunity to do so. They also consume vast amounts of natural resources, and are the reason for a significant proportion of the pollution occurring across Europe and Australia.

Velonomy brings a different perspective to the cycle–cyclist relationship. It suggests that some forms of this relationship are more likely to contribute to social transformation than others. It also hints at the existence of a spectrum, from not velonomous at all to very velonomous. Cycling activists continually refer to this spectrum, and consider that one of their goals is to help cyclists in developing velonomy, which they consider to be a desirable goal.

This political conception of cycling is developed through a consideration of tools as material objects that contribute to achieving the goals of both individuals and society. Madeleine Akrich (1987) argues that tools are very difficult to apprehend and describe, since they are

intermediaries between individuals and the operations they wish to perform. They exist in service of this aim and because of what they can help produce, not for themselves. As a result, technical objects are highly social; indeed, their shape is not only a reflection of the values, norms, materials, and representations prevalent in the society in which they were designed, but also determines social interactions related to the use of such tools, and thus helps to constitute powerful "modes of social organisation" (15). Akrich cites two different modes of energy production –fuel tanks and photovoltaic panels – as a demonstration that technical objects are in fact political, in that they configure the interactions between individuals in society. Following Akrich, it is possible to argue that the cycle–cyclist relationship also constitutes the society in which this relationship occurs, and thus, that a better society can be achieved under some configurations of this relationship. We can thus understand velonomy as the form taken by the cycle–cyclist relationship that corresponds to a greater autonomy of the cyclist in society.

This argument is developed further by Ivan Illich, who, like Akrich, proposes that tools are intrinsic to social relationships. For Illich, tools are what people can use in order to have an effect on society; thus, they are the basis of social organisation. Because of this, Illich argues that we should base a rethinking of social life on our relationship with tools:

> An individual relates himself in action to his society through the use of tools that he actively masters, or by which he is passively acted upon. To the degree that he masters his tools, he can invest the world with his meaning; to the degree that he is mastered by his tools, the shape of the tool determines his own self-image. (Illich [1973] 1975: 34)

Illich thus offers a normative analysis of tools in society and argues that a good and "convivial" society, or what I refer to here as a velonomous society, is one in which individuals surround themselves with "convivial tools": that is, tools over which they have complete control.

While Illich does not focus on repair specifically, many maintenance studies researchers adopt a similar approach to the political importance of repair and maintenance:

> Repair is a political act, a repurposing of designed objects in ways that may or may not

> have been planned. Tools or facilities for repair are similarly political in that they can rewrite conventional beliefs about what we can change and how we can change it, or be an admission that breakdown has occurred (Rosner and Ames 2014)

The lived experience of lacking control over one's cycle appears during discussions with those cyclists who are the least experienced in cycle repair and maintenance. These cyclists, even if they cycle frequently, may not fully understand their cycle and how it works. They use it in ways that are less adapted to their practices, and feel less at ease overall while on their cycle, which they to some extent consider as alien to them. A lack of repair and maintenance skills thus combines with a less comfortable relationship with the cycle to create a lower degree of velonomy overall. Some cyclists even report some fear of the inner workings of their cycle; one example is Ellie, a cyclist in Melbourne, who states that she is afraid to engage with the mechanical aspects of her cycle, and that she has a "phobia of tyres":

> *I push myself to learn lots of other things, but when it comes to the bike... anything mechanical is quite intimidating.*
>
> Ellie, cyclist, Melbourne

Velonomy and Control over Cycling Practices

Being able to control one's cycle is a personal objective for cyclists (Mundler and Rerat 2018), but it is also a political achievement: indeed, society as a whole benefits from the presence of numerous individuals who move in the ways they desire and in accordance with their personal values. Illich's concept of conviviality allows for a better understanding of autonomy that is central to the definition of velonomy: here, we can understand autonomy as the ability to use a cycle according to one's will, rather than in a way that is pre-inscribed in the tool itself. For example, according to this definition, a cycle is more convivial, and provides more autonomy, than a train, which runs at a certain pace and along a certain route that cannot be decided by its user.

The most velonomous cyclists are those who can achieve their goals and control their use of their cycle. I further develop this idea below through the use of two examples, concerning the practicality of cycling and repair and the anticipation of breakdowns respectively.

Towards Practical Cycling Practices

A lack of mechanical knowledge sometimes leads to a lack of efficiency in both cycling and repair practices. Cyclists who are inexperienced with cycle repair and maintenance are more likely to ride an ill-adjusted and uncomfortable cycle, because they are less aware of the condition of their cycle; this is detrimental to their ability to ride comfortably, and also leads to unexpected breakdowns and costs. One example of this is provided by a cyclist who, when trying his girlfriend's cycle, realised that she had been riding her cycle while unaware of its many mechanical issues:

> *For my bike, I found all the things to fix the posture, how the chain goes, how braking works and everything, I found the seat that I like, I found basically everything that works for me, actually – and so it's okay now, I don't have any issues, I just replace the brake pads every once in a while and the inner tubes when they get punctured. But my girlfriend, I don't know, she doesn't have the same sensibility as I do. The other day I tried riding her bike, and I said, "What the hell is this? We need to review everything!" When she was pedalling, there was a constant little noise. It was the noise of a problem, you know, not the noise of something that works right. Well, it turns out her bottom bracket was too loose.*[125]

Florent, cyclist, Lyon

---

[125] « Sur mon vélo j'ai trouvé tous les trucs pour la position, pour comment va la chaîne, comment va le freinage et tout, j'ai trouvé la selle que j'ai, j'ai trouvé à peu près tout ce qui me convient en fait, et du coup ça va là, j'ai pas de problème, juste à changer les patins de frein de temps en temps et la chambre à air quand ça crève. Et ma copine, je sais pas, elle a pas la même sensibilité que moi, l'autre jour j'ai essayé son vélo j'ai fait "Mais c'est quoi cette horreur ? Faut tout revoir là !". [...] Quand elle pédalait il y avait un petit bruit en permanence. C'était le bruit d'un problème hein, c'était pas le bruit d'un truc qui marchait bien. Donc voilà, le pédalier il avait du jeu. »

Similarly, velonomous cyclists find it easier to perform repairs efficiently, as they are more likely to understand what has gone wrong and what steps should be taken in order to fix the problem. However, many cyclists are not very velonomous and accordingly lack a fuller understanding of what is happening when their cycle breaks down. This frequently manifests in interactions between mechanics and cyclists who come to them for puncture repair. For example, some customers do not know that a flat tyre is caused by a punctured inner tube, and instead think that their tyre or wheel is broken. This common misconception may lead to some difficulties in the repair process.

Anticipating Breakdowns

A second unpleasant consequence of lower velonomy is the different attitude to anticipating breakdowns. The least velonomous cyclists often exhibit a lack of ability to anticipate mechanical issues. It is thus common for cyclists to ride broken cycles while being unaware that they are broken. This lack of knowledge often leads them to discover a mechanical problem only after it has become a serious issue that could otherwise have been prevented, as happened to Patricia:

> *My bike broke down after a minor incident, but it wasn't really what broke the thing. It was just that this incident had me realise that there was a problem..*[126]
>
> Patricia, cyclist, Lyon

For her part, Ellie recounted an accident that could have been avoided if she had understood the warning signs:

> *For several years, my front handles would rock. [...] One day, my handles completely fell off! I was riding, and they just flew off into the air [laughs]. Luckily I got off my bike,*

[126] « J'ai eu un petit choc, mais en fait c'est pas le choc qui a cassé le truc, la casse datait d'avant. C'est juste le petit choc qui m'a permis de m'en rendre compte. »

I didn't fall or anything.

Ellie, cyclist, Melbourne

Many cyclists are in the same situation, in that they do not anticipate mechanical issues even when faced with clear evidence that something might be wrong. For example, one respondent mentioned that she pumped up her tyres whenever she "heard them make some noise": in fact, this "noise" is an indication that the tyres have deflated to such an extent that riding becomes both extremely uncomfortable and damaging to the wheels. Inflating them ahead of this stage would lead to a more comfortable, efficient, and safe riding experience. Lack of repair and maintenance skills can accordingly prevent a cyclist from detecting, understanding, and treating the warning signs that their cycle is giving them.

Reciprocally, cyclists who are very experienced with repair can anticipate breakdowns and solve them before serious consequences result, thus preventing these breakdowns from disrupting their cycling practices. Knowing how a cycle works allows the cyclist to anticipate breakdowns. For instance, Florian rides in a way that allows him to unconsciously monitor the condition of his cycle:

> *I ride every day, and because of this, I would be able to tell, just by taking the bike and making the wheels turn a couple of rounds, whether there is some play in the bottom bracket, in the steering, or if the tyres are not inflated enough.*[127]

Florian, cyclist, Lyon

Velonomy and Dependency

Another aspect of conviviality is that tools should not create a dependency, result in a monopoly, or contribute to the constitution of mass inequalities within a society. Indeed, in a

[127] « Moi en roulant tous les jours, je serais capable de dire, juste en prenant le vélo et en faisant quelques tours de roue, s'il y a du jeu au niveau du pédalier, dans la direction ou si les pneus ne sont pas assez gonflés. »

society dependent on a certain mode of transportation, people who cannot use it are sanctioned, as is the case of people without a car in car-dependent environments (Dupuy 1999). For Illich, "Tools foster conviviality to the extent to which they can be easily used, by anybody, as often or as seldom as desired, for the accomplishment of a purpose chosen by the user." (Illich [1973] 1975: 35) Dependency on a means of transportation is thus considered undesirable, as a person using such transportation does not necessarily do so by choice.

As always, this discussion of cycles and dependency must be framed within the context of ubiquitous automobility (Cox 2019: 4). Under Illich's criteria, cycles are more convivial than cars, since they require less expertise to ride and can be more easily understood and repaired. Cars create dependency by transforming spaces and lifestyles in a way that makes their use necessary (Urry 2004). Thus, cycling practices contribute to challenging, questioning, and confronting the domination of cars and the dependencies they create.

In addition to dependency on one given tool, another important consideration is that of dependency on others in order to use this tool. This is the reason why Illich warns against very sophisticated tools, the use and repair of which require advanced knowledge that can only be mastered by an elect few. He also warns of systems that lead to the professionalisation of skills that could have been mastered by most people, since he considers that such processes of professionalisation lead to dependency on others.

Although the cycle is a vehicle that generates less dependency than the car, this is also contingent on the personal experience of cyclists, who can be more or less velonomous. The least velonomous cyclist can experience a stronger dependency on others compared to a more velonomous cyclist. For example, Ellie described how, for a long period, her father would maintain her cycle, without her understanding precisely what he was doing:

> *Yes, and I wasn't riding it that much, and then my dad would come over – and all he would do, now I do understand, he tightened [components] with an Allen key.*
>
> Ellie, cyclist, Melbourne

Ellie, like many other cyclists, also recounted her unpleasant experience of going to a cycle shop for a repair and being told that more components on her cycle needed repair than she had initially anticipated. While she found this outcome acceptable and trusted the mechanic who gave her the diagnosis, this reliance on professional expertise is a form of dependency that is detrimental to velonomy. Mechanics are knowledgeable about this dependency, and sometimes joke about it. For example, Renaud, a mechanic who prides himself on being able to repair something with extreme ease when a customer would have expected it to take a lot longer, describes it as follows:

> *Often, I have a look, I see the problem, I do one little thing, and it's sorted. And people say, "woaaaah, how much do I owe you?" Well, nothing, it's free, I only did one thing! "Really?! Oh, but I must owe you something!" You know? Often this occupation is such that you can fix a small thing at a glance. It could be a brake cable that needs to be clipped back in its place. And people are like, "I don't have brakes anymore!". Well, look, I just put this back on and it's fixed. It's tiny things sometimes.*[128]

Renaud, mechanic, Lyon

This phenomenon may thus lead to lower velonomy among cyclists, as it transforms their relationships with others and makes the cyclist more dependent on them than they might prefer.

Notably, however, this conception of autonomy does not mean that there should be no restrictions on tool use and on cycle use. In fact, Illich advocates for moderate energy consumption and believes that it is important for tools to be animated by an energy that is fully under the control of their users. Autonomy thus does not represent a full freedom from the social and material world, but rather a more direct relationship between individuals and their

[128] « Souvent je fais ça regarde, le problème il est là, je fais ça, c'est réglé. Les gens ils font "woaaaaah, je vous dois combien ?". Bah non bah là c'est gratuit, j'ai juste fait ça ! "Ah bon ! Oh mais combien j'vous dois quand-même ?". Tu vois ? Souvent le métier fait que tu peux en un coup d'œil juste remettre un petit truc au bon endroit. C'est par exemple un câble de frein qui est sorti de son logement. Les gens ils font "j'ai plus de frein". Bah regardez, je remets juste ce truc à sa place, c'est des toutes petites choses parfois. »

tools, and thus between individuals and their effect on society. The autonomous freedom of velonomous individuals is accordingly one that takes the scarcity of natural resources into account. This conception of autonomy, as opposed to "total freedom", is developed by Noel Cass and Katharina Manderscheid when defining the concept of "autonomobility":

> We assert freedom as a central value of an autonomobility system, understood not in 'positive' terms of mobility being individually unlimited (or rather, only limited by economic power) but 'negatively' as *freedom from compulsion* (Berlin, 1969). Translated into common-sense terminologies of rights, there should be, as far as possible (with the limits defined by present and future impacts), a right to move and a correlative right to remain immobile if necessary/desired. Operating under conditions of scarcity, such rights would not be absolute, but relative, and judged in the contexts of social necessity and value, subject to social negotiation. (Cass and Manderscheid 2018, emphasis by authors)

Another important insight that can be derived from the concept of "autonomobility" is the focus on the capacity to move, or not, according to one's wishes. Indeed, the system of automobility is characterised by a strong pressure on the localisation of housing and employment, which in turn creates a strong need for mobility among people who may have preferred to move less or to move differently (Urry 2004). This emphasis on capacity is important for an approach of mobility justice; indeed, mobility injustice may take the shape of forced immobilities for certain categories of the population (older, poor or unemployed people) whereas for others, it takes the shape of forced mobilities, (as in the case of the Traveller community). The idea of capacity, or autonomy, allows the development of an integrated approach encompassing these different forms of mobility injustices (Gallez 2015).

Following this, it is possible to conceive of velonomy as the ability to move by cycle without being forced to, as well as the ability to repair one's cycle without having to do it in a pre-defined way.

Velonomy thus represents a condition of the cycle–cyclist relationship that allows the cyclist

some autonomy within their mobility, and within society, while still taking the common good into account. It is thus a political interpretation of the cycle–cyclist relationship.

3.c. Velonomy as a Process[129]

Velonomy is not a given: it is a process occurring within the cycle–cyclist relationship. The previous section of this chapter has argued that an accurate conception of the cycle–cyclist relationship must take the evolving nature of this relationship into account. As the cycle changes or decays, or is repaired or adjusted, or as the cyclist learns more about how to ride or how to repair, the cycle–cyclist relationship will evolve accordingly. One way in which this evolution may be understood is through the application of theories of sociology of consumption. Indeed, the cycle is both a tool and a consumer good that can be purchased in certain markets in exchange for money. In the above, some theories from science and technology studies were employed to discuss the cycle as a tool. I now investigate consumption studies to explore the cycle as a consumer good.

Appropriating the Cycle

The anthropologist Marcel Mauss ([1924] 2012) previously drew attention to consumption as a form of identity creation. In many societies, material objects play a role in representing their actual or previous owner, as has been widely discussed in anthropological research (Julien and Rosselin 2005).

One key contribution to this field is Daniel Miller's book Material Culture and Mass Consumption (1987), which explores the relationships that individuals in our society maintain with the manufactured objects that surround them[130]. Following Hegel ([1807] 2019), Miller argues that material goods constitute material culture in that they are an externalisation of who we are as a

---

[129] Part of the arguments developed in this section were published in Abord de Chatillon 2022. *'Appropriating the Bicycle: Repair and Maintenance Skills and the Bicycle-Cyclist Relationship'*. In Becoming Urban Cyclists, edited by Matthieu Adam and Nathalie Ortar, 215–43. Chester: Chester University press.

[130] I would like to thank Sophie Chevalier for pointing out Miller's work as relevant to my own work during the AnthropoVilles annual congress in November 2019.

society at the time they are produced. Society is thus constituted by these objects, which act as the "bricks" of our social lives and frame our social interactions. While Marx ([1867] 2013) describes this relationship through the lens of production, Miller advocates for a more contemporary reading of Marx's work, with a focus on consumption rather than production.

The work of German sociologist and philosopher Georg Simmel ([1900] 2011) further considers the action of consumption. Miller argues that consumption does not inherently create a relationship with the material object being consumed, and that possession should instead be considered both an activity and a profound relationship, since it is inscribed in time. Miller goes on to argue that developing this relationship has been made more difficult by the increased availability of material goods within a consumer society:

> The massive increase in objective material culture has not been appropriated by the subject in such a way that material goods become the instrument of the subject's self-development through the sublation of its own projections; instead, the subject confronts the world of material goods as an alien sphere. (Miller 1987: 77)

Faced with these issues, individuals associate themselves with certain material objects in a process referred to as appropriation. This concept of appropriation provides us with new insights regarding how velonomy may develop in the course of the life of cyclists, namely as an appropriation of the cycle. This appropriation occurs through acquiring, possessing, and using a material object, or what Miller terms "the work of consumption", through which meaning can be transferred back into the objects while they are reintroduced into the social lives of the subjects.

One example of appropriation of the cycle, or of the way it can be increasingly integrated into a cyclist's life, is provided in the following extract of a conversation with Aline, a woman who often carries her groceries and her daughter on her Dutch cycle:

> *I have a small hand pump – it works, but it has more limited capacity and takes longer to inflate. And, you know, you can't see the air pressure displayed, so you can't be truly*

sure of where you're at. Even if I don't need anything that [...] I just need it to ride, to brake. And when I ride my bike, I usually plan my trip based on the lowest speed. I never worry about the time, or think, "oh, I have to be fast". And even if the tire isn't inflated perfectly at 3 bars, as it should be, well, that's not so bad, it'll just be harder for me, but there isn't much at stake.

Aline, cyclist, Lyon

Aline says that she does not mind her pump not being high-capacity, since she does not cycle with the goal of achieving high performance. Her approach to inflating her tyres, as well as the resources she regularly uses, are thus not ideal, but are adapted to what she considers her riding practices should be. Aline's confidence that she knows exactly what uses she can make of her cycle allow her to feel comfortable with her repair and maintenance practices as they are. In this way, she has appropriated her cycle, since her repair and maintenance practices fit her idea of herself and the person she is in society.

A key moment in this process of appropriation is purchase (or acquisition of ownership, if money has not been exchanged), as an initial and important radical transformation of the relationship with a material object:

> As consumers, we confront these abstractions of money and the state most fully at the moment of obtaining goods. [...] The situation is radically transformed upon obtaining the goods in question. On purchase, the vast morass of possible goods is replaced by the specificity of the particular item. The extraordinary degree of that item's specificity becomes apparent when it is contrasted with all those other goods it is not. Furthermore, this specificity is usually related to a person, either the purchase or the intended user, and the two are inseparable; that is, the specific nature of that person is confirmed in the particularity of the selection, the relation between this object and others providing a dimension through which the particular social position of the intended individual is experienced. This is the start of a long and complex process, by which the consumer works upon the object purchased and recontextualizes it, until it is often no longer

> recognizable as having any relation to the world of the abstract and becomes its very negation, something which could be neither bought nor given. (Miller 1987: 190)

Through applying the concept of appropriation, it is possible to highlight some connections between the model of material possessions and velonomy. In the course of acquiring velonomy, cyclists develop their autonomy and independence from others regarding their use of the cycle, but they also develop a relationship with their cycle – they integrate it into their lives, whether by developing a feeling of affection for it or developing uses adapted to their needs. The development of velonomy may also have a symbolic aspect. Indeed, an important step of appropriation is what Miller terms "recontextualisation": material objects may become representative of a group of individuals, and meanings associated with these objects may become a part of these individuals' identity.

The process of developing velonomy thus belongs to a more general process through which individuals or social groups shape and appropriate material culture rather than considering it as alien. The idea of appropriation considers the cyclist as a consumer who also exerts their agency on the material world. The shape taken by this agency evolves over time, in the course of both repair and maintenance practices and cycling practices.

Appropriation in Action

I argued previously that repair and cycling practices should be considered as intertwined. This means that the development of velonomy occurs simultaneously at two levels: at the level of cycling practices, and at the level of repair practices. Cycle repair can be learned while on a cycle, and cycling can also be learned in the course of repair. This subsection explores the diverse forms of appropriation that occur as cyclists become familiar with cycles in general, and with their own cycle specifically, over the course of time.

Learning Repair within Cycling Practices

Although it is possible to learn repair and maintenance in a workshop or a classroom, it is also possible to learn it within cycling practices, and sometimes as part of the cycle–cyclist hybrid.

It is common that a cycle breakdown or accident will reconfigure the way a cyclist understands the operation of their cycle. Ellie's bad experience with her cycle handlebars stayed with her; it made her reconsider things that she had not previously cared about and understand them in different ways. Acts of repair and maintenance, such as her father regularly maintaining her bike, were understood differently after the incident.

It is common for cyclists to discover something about how their cycle works after it suddenly breaks down. One example of this is provided by Daniel, a cyclist who recounted a trip that he went on twenty-five years ago: this trip was an important life experience, but also a time during which he learned a lot about how cycles work, as shown by the following extract:

> *Thinking about that, when I did the trip, I learned a lot as I went. So I actually got a new chain when I came over to Australia, I had brought the bike with me, but I didn't realise that the shop that [put the chain on] hadn't put on a new cassette. So I found out the hard way as I was going up in Kangaroo Valley, New South Wales, and it just kept slipping. Because it's a new chain and an old cassette, [...] it was slippery, it would come and go. I have learned since then that you've gotta pay for the whole thing. And I don't know why the shop didn't just do it.*
>
> Daniel, cyclist, Melbourne

Daniel understood that something was wrong when his cycle began to change gears for seemingly no reason, but it was only afterwards that he came to understand exactly what had caused the issue. He thus learned in retrospect that, in some cases, chains and cassette should be changed at the same time. This shows that learning is not a linear experience, but rather one in which each new event re-contextualises previous events (Delbos and Jorion 1990).

These examples demonstrate how the appropriation of the cycle proceeds through a back-and-

forth exchange between the theoretical application of mechanical principles and the sensorial experiences of riding. Cycling manifests as a test of the theoretical knowledge of cyclists and mechanics alike. What Daniel initially thought was right turned out to be incorrect once he was actually riding; in this case, the cycle–cyclist hybrid was the site for a lesson of repair.

In addition to the cycle–cyclist hybrid, there are other aspects of cycling practices that create the opportunity for acquiring velonomy. Indeed, the acquisition of repair skills can be triggered by diverse events related to the general cycling life and projects of individuals, for example in the case of the acquisition of electric cycles (Marincek 2021; Müggenburg, Busch-Geertsema, and Lanzendorf 2015). We can sort such events into three categories, each of which can be an opportunity for learning about repair: namely, the intensification, transformation, and continuation of riding practices.

The first category of key events is when cyclists *intensify their riding practices*. This can take the form of a house move that extends the length of a commute, or of an upcoming trip. For instance, Caitlyn attended a basic cycle maintenance workshop as a way to prepare for a cycle tour of New Zealand; as she explained it, "I didn't know how to change a tyre and I thought it would be important to learn before I went".

The second category is that of key events related to a *transformation of riding practices*. One example is the case of Florent, a man who, when his father died, found himself alone in his house with an old cycle that he decided to turn into a fixed-gear cycle as a new project. In the course of doing so, he visited numerous cycle shops and asked them for advice about the mechanical aspects of fixed-gear cycles; over time, this allowed him to learn enough repair and maintenance skills that he subsequently decided to become a cycle mechanic.

Another example of learning repair skills through the transformation of riding practices is the purchase of a new cycle. For instance, Aline was once given money to purchase a good-quality cycle. She then searched for one that would have a similar coaster (pedal) braking system as the cycle she used to ride. She recounted how this search made her aware of some technical aspects of the cycle that were previously unknown to her:

> *It happened when I was looking for a pedal brake bicycle. The thing is, we often confuse pedal brakes with fixed-gear or freewheel, but they're not the same. That was it, that was how I was confronted with, how I learned the difference between the two and which one I wanted and all that. [...] I don't know how I could have learned otherwise*.
>
> Aline, cyclist, Lyon

The third category of key events in cycling practices that lead to the acquisition of repair and maintenance skills occur in the course of the *continuation of riding practices*. One example of this was provided by Karen, a middle-aged e-cycle rider who regularly takes her cycle to a particular shop for servicing. Over time, Karen established a relationship with the mechanics working at this shop, who often gave her advice on how to maintain her cycle. For instance, as she recalls, they advised her to change gears more often, despite her not feeling the need to do so on her electric cycle: in her own words, "When the bike chain had to be changed, the guys tried to explain to me how to use it better so that it would not happen that often, and I think I got better at it now."

In another example of such an interaction, Karen received advice from the mechanics on how to better inflate her tires: "So again, I went back, and then they said, 'you got a lot of wear on your tires because you are not pumping them up enough', and blah blah blah. I said, 'no, I've pressed them and they're fine!', but no, it was not as pumped up as supposedly it needs to be." According to Karen, these frequent visits to her local cycle shop contributed to her good relationship with the staff, who then began to give her mechanical advice. Her regular riding habits and her social integration with the cycle shop staff are two factors that contributed to her acquiring cycle repair and maintenance skills, including the ability to gauge whether the pressure in her tires is sufficient by squeezing them.

The appropriation of the cycle may thus occur in the course of cycling practices, either while riding (within the cycle–cyclist hybrid) or outside of riding, when cyclists decide to intensify abd.ir transform their practices, or while continuing them. Cycle shops can also contribute to cyclists appropriating their cycles.

Transforming Cycling by Learning Repair

Learning repair, and the practice of repair, both contribute to the appropriation of the cycle, since they transform the cycle–cyclist relationship. This appropriation occurs both within the cycle–cyclist hybrid and outside of the riding experience.

Acquiring repair and maintenance skills transforms the ways in which cyclists ride and the experience of assembling into a cycle–cyclist hybrid. For example, Caitlyn, who attended a cycle maintenance workshop in anticipation of her New Zealand trip, states that her riding behaviour changed after attending the workshop:

> *I probably inflate my tyres more regularly now. I didn't realise that I needed to do it so often. I was riding around with probably close to flat tyres, let's be honest. I had to change my brake pads myself as well [...] And that was good, like, I felt confident to do that, to adjust the brake pads. That was fun. And now... I had a crash recently and now my brake pads need replacing again, on the front end, and I feel confident to do that, to just tinker.*
>
> Caitlyn, cyclist, Melbourne

Caitlyn's testimony shows that learning repair skills transformed not only her ability to intervene when her cycle breaks down, but also the way she considered her cycle. She additionally felt more confident experimenting with its mechanical setup. The workshop contributed both to transforming her attitude regarding her cycle and her appropriation of it. Furthermore, it led her to reconsider her embodied perception of adequate tyre air pressure, since she now feels less comfortable riding with deflated tyres than she used to. This example illustrates how acquiring repair skills can contribute to the appropriation of the cycle, as expressed through the cycle–cyclist hybrid.

Learning repair also transforms the cycle–cyclist relationship beyond the immediate moment of cycling. For instance, Barbara, who recently created a repair organisation for women, found that

learning repair skills allowed her to keep her cycle for longer and to ride further without fear. By developing some ease with repair, she not only changed her riding habits, but also transformed some broader life habits related to her cycle:

> *One of the main things is to not be too quick to throw away my bike. Now I know how to maintain my bikes, so it's okay. Particularly in bike shops, they're always quick to go 'get rid of that bike,' but actually, I'm finding that I don't want an upgrade. I'm quite connected to my old vintage bike, and I just want to maintain it to a point where it rides fine, it gets me from A to B. It's been a big shift, just knowing that you don't always have to upgrade. And also, I guess I'm more confident riding around, and I always carry around a tool set and stuff, so if something happens, I'll be able to do the repairs on the road.*
>
> Barbara, mechanic, Melbourne

Barbara's situation presents an example of a cyclist's relationship with their cycle being transformed by the acquisition of cycle repair and maintenance skills. She found that these skills brought more autonomy into her riding practices.

This process of appropriation goes both ways: the learning of repair transforms the cycle–cyclist relationship and cycling practices, while the unfolding of cycling practices in someone's life also transforms their relationship with their cycle and contributes to their acquisition of velonomy.

3.d. Velonomy within a Society

If velonomy is a specific state of the cycle–cyclist relationship, then where does it originate from, and who or what is responsible for making it happen? According to the Collins English Dictionary, "autonomy" is defined as "The ability to make your own decisions about what to do

rather than being influenced by someone else or told what to do."[131] In this context, velonomy could be understood as the ability to make one's own decisions regarding a cycle without any external influence. However, a further exploration of the idea of the cycle–cyclist relationship encourages a more nuanced approach to this concept of autonomy. Indeed, autonomy regarding the use of an object is not something that occurs in a void: it in fact occurs in relation to, and is constituted of, a range of social factors and the characteristics of the object in question. In this subsection, I focus on several elements that articulate together, each fostering velonomy at their own scale, in order to develop a more nuanced concept of velonomy.

A Velonomous Cyclist

The earlier subsections of this chapter have explored and developed several aspects of velonomy in order to better highlight their characteristics and how they unfold in the lived experience of cyclists. The focus in the following chapters of this thesis will shift to different social dynamics of velonomy as they are embedded in economic systems, social norms, and the material resources available to cyclists.

Prior to this exploration, we should also take into account the cyclist as a carrier of velonomy. I will now describe two aspects of velonomy as it is experienced personally by the cyclist: the knowledge of parts and materials, and the mastery of precise vocabulary.

The work of repair is based on possessing a very good understanding of the materials used in the machine that is being repaired and of how it behaves in different situations (Harper 1987). Similarly, for a cyclist, being velonomous is associated with an understanding of the materials and components of a cycle, something that allows for a better understanding of both cycling and repair. One example of this is provided by Chloé, who considers herself able to autonomously complete most repair operations her cycle requires.

> *One gear cable broke down inside the gear shifter [...]. But that had already started becoming noticeable – it's true that I'd previously noticed that it was harder to shift*

[131] URL: https://www.collinsdictionary.com/dictionary/english/autonomy

gears, and I think that the cable had started loosening already, maybe some threads had started breaking.

Chloé, cyclist, Lyon

In short, Chloé is knowledgeable about the composition of brake cables (which are made of threads), and can apply this knowledge to understanding and anticipating mechanical issues.

A second aspect of velonomy as it is experienced by cyclists is the use of precise vocabulary to talk about the cycle. In the above example, Chloé has mastered the appropriate vocabulary ("shifter", "gear cable") and is able to precisely describe the problem she experienced.

Procedural knowledge, like that involved in riding or repairing a cycle, is very difficult to put into words (Watson 2006); moreover, in some manual professions, it is considered inappropriate to describe or explain a technical action (Delbos and Jorion 1990). Despite this, the knowledge of a specific vocabulary and way of speaking is key to engagement with technical practices. For instance, Ellie, who does not feel confident when it comes to repair, also struggles with cycling vocabulary:

I say "left and right brake" instead of "front and back brake," that kind of thing.

So he actually fixed the tires, he gave me new brake cables, he gave me new... something else, and something else, at the same time.

Ellie, cyclist, Melbourne

The mastery of specific vocabulary also contributes to the socialisation of a new practice, as demonstrated by Agnès Jeanjean's study of construction workers (2009). Velonomy is a social relation with others: by engaging skilfully with material objects, practitioners give themselves self-worth and position themselves in society (Naji 2009). Similarly, the practice of cycle repair and maintenance contributes to feelings of legitimacy as a cyclist (Aldred 2013a). This sentiment is expressed by Ellie, who regularly mentions friends of hers who are more knowledgeable

about repair than she is. Her relationship with cycles is also very important for her social relations at her workplace:

> *As an avid cycler, people talk to me about how bikes work, but when they talk to me... I just smile. Because where I work is a depot, it's rather uncommon to cycle there, so people talk to me about bikes all the time, and I'm just like, "oh, yes, I understand."*
>
> Ellie, cyclist, Melbourne

Ellie thinks that it would be easier to bond with her colleagues if she was more knowledgeable about cycles. She sometimes even pretends that she understands what they are talking about in order to fit into the conversation.

The study of velonomy, even when focusing on the standpoint of the cyclist, must also integrate with the wider environment in which cycling and repair practices take place. One example of this is an interaction that I had with two cyclists who were inflating their cycles at a public pump in a park. When I asked them why they had thought inflating their tyres was necessary, they answered that they were going on a ride, but suddenly realised that one of them was "unusually slow": "I usually beat him!" one of them said, while laughing. This shows that the habit of riding together, with the same cycles and in the same environment, had allowed these cyclists to develop a precise embodied knowledge. They knew their usual respective rhythms in relation to the physical efforts they invest, and thus knew that any variation in those rhythms would likely be due to a mechanical issue (such as deflated tyres). This example demonstrates the importance of the wider environment in velonomy as experienced by cyclists.

Although velonomy is the outcome of assembled elements, the cyclist, as a carrier of cycling and repair practices, also contributes to its development. Acquiring specific vocabulary and developing some knowledge of cycle components is part of this development. But the individual aspects of velonomy are also context-dependent.

A Velonomous Object

Velonomy is not only carried by the cyclist, but also strongly dependent on the cycle itself, its shape, and its characteristics. When discussing convivial tools, Illich asserts that a material object carries within itself some basis for the relationship that people maintain with it:

> Tools foster conviviality to the extent to which they can be easily used, by anybody, as often or as seldom as desired, for the accomplishment of a purpose chosen by the user. The use of such tools by one person does not restrain another from using them equally. They do not require previous certification of the user. Their existence does not impose any obligation to use them. They allow the user to express his meaning in action. (Illich [1973] 1975:35)

For instance, a smartphone is a non-convivial tool. While it provides its users with many capacities that they would not have without it, they are not free to decide exactly how and exactly when they use it. They also cannot repair it or change basic things about it (for instance, if they wish to replace the battery or some parts of the camera); such changes either require the help of a specialist or are not possible at all.

Cycles foster velonomy, as tools foster conviviality, by their ability to be controlled by the individuals using them. Cycles can therefore also be regarded as being carriers of velonomy.

For Illich, convivial tools allow their users to be in control of their operations on the world, and thus to transform the world in the way they want; by contrast, non-convivial tools control the ways in which people operate, as well as the way they feel. Illich considers that industrialisation, and the corresponding division of labour and specialisation of tools, led to an increase in the complexity of tools used, and therefore a decrease in their conviviality:

> The inhabitant of the city is in touch with thousands of systems, but only peripherally with each. He knows how to operate the TV or the telephone, but their workings are hidden from him (Illich [1973] 1975: 73).

Illich is also concerned with the rise of professions that establish some form of control and monopoly over activities that used to be performed by individuals. For him, the fact that "Ford produces cars that can be repaired only by trained mechanics" (78) is proof that, if goods are designed in a non-convivial way, individuals will lose their freedom, since they will be dependent on professionals to live their everyday lives. Indeed, convivial tools are such that their very shape makes it easy to understand exactly how to use them:

> Crucial to how much anyone can learn on his own is the structure of his tools: the less they are convivial, the more they foster teaching. (Illich [1973] 1975: 72)

This discussion of convivial tools applies to cycles and velonomy: a cycle can be more or less velonomous. Most cycles allow their user to exert precise control over the exact speed and trajectory of their travel. Illich also states that the range of speeds at which a cycle moves give "optimal value to community life", and that any vehicle capable of travelling faster than cycle speed creates space scarcity, inequalities, increased costs, and road congestion (Illich [1973] 1975:97). The cycle is accordingly a tool that multiplies its user's capacities rather than replacing or reducing them.

Another central aspect of this conviviality of the cycle is its repairability, since it can be repaired with much simpler tools and fewer mechanical skills than a car: although the profession of cycle mechanic does exist, and these mechanics mediate repair for many cyclists, the previous chapter demonstrates that many cyclists feel comfortable engaging with repair themselves without assistance from others.

Furthermore, many parts can be replaced or added to the cycle in order to transform it for another use.

However, not all cycles are equally velonomous: some of them are more easily ridden, repaired, or transformed, depending on their materials, the technologies included in their components, and their other characteristics. For instance, a road cycle with clip-on pedals requires specific clothing (the cyclist must be wearing shoes that match this type of pedal), as well as specific

skills (related to how to clip into and unclip from the pedals). The same cycle equipped with flat pedals can be used with almost any sort of shoes and without any specific training. A cycle with clip-on pedals is thus, to some extent, less velonomous than one with flat pedals.

A Velonomous Society

Another important contributing factor to velonomy is the extent to which society favours and supports cycling and repair practices. It is important to understand autonomy, and thus velonomy, as something social. This idea, which initially appears to contradict concepts of autonomy, is discussed by Matthew B. Crawford:

> [The tradesman's] individuality is thus expressed in an activity that, in answering to a shared world, connects him to others: the customers he serves and other practitioners of his art, who are competent to recognize the peculiar excellence of his work. Such a sociable individuality contrasts with the self-enclosure that is implicit in the idea of 'autonomy'. The idea of autonomy denies that we are born into a world that existed prior to us. (Crawford 2010: 206)

The consideration of velonomy as a relational and social quality echoes the idea in practice theory of cycle riding or repair as practices that are embedded in a web of materials, competences, and meanings. As a goal to achieve, "autonomy" cannot be separated from the social surroundings of the cyclist or mechanic. In order to express this relational aspect, I chose to develop and employ a definition of velonomy in which the term "autonomy" is used in conjunction with "ease".

The social aspect of velonomy is also emphasised by Illich's term "convivial society". He argues that such a society should allow all its members the most autonomous action by means of tools least controlled by others (Illich [1975] 1973: 33). According to Illich, individuals should work to establish a more convivial society, since this equates to "defending their liberty" (Illich [1973] 1975: 38). The way in which society is organised is central to the relationship that people

maintain with their tools; for instance, through the widespread provision of information regarding their use in a way that facilitates the learning of skills through ordinary living. A velonomous society is thus a society organised in a way that facilitates the velonomy of its citizens. The existence of many community spaces in which people can learn how to repair their cycle themselves, along with the availability of affordable spare parts and tools, are two examples of elements constitutive of a velonomous society. Overall, the broader social and economic environment shapes the affordances given to individuals related to the use and repair of their cycle.

One of the ways in which a velonomous society could develop is through normalising a form of social relations in which people are accustomed to discussing cycles and their condition. For instance, one cyclist I conversed with told me about her habit of asking her friends about their cycles, something that sometimes led to collective repair:

> *I was just at [my friend's] house… I think I must have said something like, "how's your bike going", something like that, and he's really into bike riding as well, so with him it's more a normal conversation. And then he was like, "oh yeah, this is happening, I don't know what's wrong." And I said, "oh, maybe I can have a little look at it!"*
>
> Olivia, cyclist, Melbourne

Through his concept of convivial society, Illich defends ideas similar to those put forward by Cornelius Castoriadis, for whom the idea of autonomy should be simultaneously considered at the individual and social levels. For Castoriadis, the liberal idea of a freedom experienced uniquely at the scale of the individual, independently from institutions, is impossible (Straume 2013: 218). Instead, he argues that society and its institutions are the primary space in which the conditions are set for autonomy and for exercising freedom.

A similar idea is raised through the concept of autonomobility (Cass and Manderscheid 2018): while the supremacy of the car is enforced by a whole system, comprising a network of infrastructures and social norms, developing a mobility that would be environmentally and

socially just would also require the transformation of infrastructure and norms, specifically the construction of a complete system that encourages fair and sustainable mobilities. Cass and Manderscheid focus more on the environmental aspect of mobility than the technical aspect; unfortunately, their insights therefore do not extend to the relationship that can be had with the vehicle used to move. Nevertheless, their work makes important contributions to an understanding of the social implications of mobility, along with the systemic changes that are required for its transformation.

It is thus important to step away from singling out the cyclist as the only carrier of velonomy, and the only element of the development of velonomy – by contrast, it must be acknowledged that the way in which cyclists engage with their cycles, and the design of these cycles, are also determined by local and global social processes.

To conclude, this section introduced the concept of velonomy, as used by cycling activists and in academic discourse, and developed it in relation with other theoretical concepts, such as appropriation (Daniel Miller 1987), convivial tools (Illich [1973] 1975), and autonomobility (Cass and Manderscheid 2018). Velonomy is thus defined as the level of autonomy of a cyclist: that is to say, the ease they show in riding their cycle, as well as in repairing, maintaining, and adjusting it, in order to achieve their individual and collective goals. This definition aims to illustrate the intertwining between cycling and repair practices, as well as to highlight the political aspect of these practices. This exploration allows for an understanding of velonomy as a condition of the cycle–cyclist relationship, which contributes to a just society, and which is developed through a process that begins during the purchase or acquisition of a cycle and evolves throughout the course of material interactions with it. Velonomy accordingly resides in an interaction between the cyclist, society, and the cycle itself.

Conclusion

In this chapter, I have constructed a detailed conception of the cycle–cyclist relationship, with the help of three theoretical anchors: the model of material possessions developed by Olga Dittmar (1992), discussions of material interactions, and my own extended formulation of the concept of velonomy. Through these, I present the complexity of the cycle–cyclist relationship, in which affective care and symbolic pride for the cycle co-exist, intertwined with each other, and are made real through the material interactions of riding and repair.

The model of material possessions highlights different aspects of the cycle–cyclist relationship that correspond with the feelings that many cyclists have towards their cycle: some feel a strong attachment to it, others find that it contributes to their social status or helps them to belong to certain social groups, while others care only about its instrumental use, considering it to be a tool and nothing else. These different aspects of the cycle–cyclist relationship are grounded in the individual experiences of cyclists, the model and condition of their cycles, and their cycling experiences overall. Practices of repair are reciprocally transformed by these different aspects of the cycle–cyclist relationship.

However, the model of material possessions is of limited use in explaining cycling and repair practices; it does not permit a full understanding of the evolving nature of the cycle–cyclist relationship, nor of the intertwining between cycling and repair or that between the different dimensions. Accordingly, I instead advocate for a model of the cycle–cyclist relationship based on use and material interaction: in short, it is through material interactions involving the cycle that the cycle–cyclist relationship occurs, while the affective, symbolic, and instrumental aspects of this relationship articulate with each other.

In a final section, I introduce velonomy as a concept that is widely used among cycle activists, and increasingly in academic literature. Velonomy is one form that the cycle–cyclist relationship may take. Using this concept allows avoiding the shortcomings identified in the model of material possessions while shifting focus towards the political implications of the cycle–cyclist relationship, something that was not easily achievable with existing theories of material interaction. As the concept of velonomy had not been previously defined in-depth, I presented

some meanings that it carries as they can be applied to cycling and repair: its political implications in relation to control and dependency, its processual nature, and the fact that it is fostered by several actors and elements of practice.

The political nature of velonomy transforms our approach to cycling and repair practices. It provides us with a frame for discussing the social context in which the cycle is designed and used, including the accessibility of repair skills in a given time and place, the evolution of cycle design, planned obsolescence, the training of cycle mechanics, and the availability of cycle tools. It also allows for cycling and repair to be discussed together, without the need to make assumptions regarding the relationship between both practices. Velonomy suggests a direction that these practices could take, while also providing the researcher with an easy tool to evaluate the practices themselves and how they unfold in the urban space. It can thus also inform policymakers and cycle designers. Velonomy is the framework used in the following two chapters of this thesis.

Chapter IV: Velonomy in a Consumer Society

"Dénivelé violent, pédale comme une cinglée

Fini par faire des wheelés pendant que tu tinques des

Litres et des litres d'essence

Mon bike y date d'avant la Renaissance

Monter des côtes sur la grosse gear, au pire

Rendue en haut c'est sûr que tu vas perdre connaissance, ayy"

Calamine, "Les 4x4", 2020

The previous chapter introduced velonomy as an aspect of the cycle–cyclist relationship, which is deeply shaped by the socio-economic environment in which it occurs. The aim of this chapter is to explore the cycle–cyclist relationship as it is framed by the consumer society that exists in both Lyon and Melbourne at the time of this study.

Velonomy has been defined in this thesis as an individual's level of autonomy regarding cycling; that is to say, the ease they show in riding and repairing their cycle. Velonomy is fostered by the cyclist and by the cycle itself. It also resides in the general social context in which cycling practices take place: this context can be more or less velonomous according to whether it facilitates the appropriation of the cycle by a diversity of cyclists and the development of accessible repair practices. This chapter addresses consumer society as it mediates the cycle–cyclist relationship and transforms velonomy.

In a consumer society, the cycle is a commodity, and is as such subject to market dynamics and economic inequalities. It is designed, marketed, and sold according to market dynamics, which in turn impact velonomy and the cycle–cyclist relationship. Furthermore, in industrialised

societies, where the focus is on saving time and specialisation of skills, repair is both an activity that involves restoring the object (cycle), thereby enabling the continuation of cycling practices, and a profitable activity for shop owners and mechanics. The choice to repair one's cycle or to hire someone to do it is made in a context in which the financial resources of cyclists vary, accordingly becoming a source of inequality. Indeed, this unequal access to some resources restricts the choices available to cyclists when it comes to repair, and thus limits their velonomy.

In the first section, the status of the cycle in a consumer society is discussed. The cycle is not only a tool defined by its use, but also an object with a market value. This section also describes the many forms of planned obsolescence to which the cycle is subjected

The status of cycles as commodities produces inequalities in velonomy between different socio-economic groups. Accordingly, the second section focuses on the link between income and repair and maintenance practices. Lower-income and higher-income cyclists have different relationships to cycles, since these relationships are mediated by consumer markets and trends; this difference also exists in the context of repair and maintenance practices.

The third (and final) section of this chapter focuses on repair and maintenance spaces and the ways in which they enable or restrict velonomy, with particular attention paid to community workshops and cycling shops. Each of these spaces, which collectively constitute an ecosystem of repair and maintenance, is exposed to consumer dynamics in different ways and provides cyclists with different resources.

1. The Cycle as a Consumer Object

This section aims to explore the nature of the cycle in a consumer society.

1.a. The Cycle as a Disposable Good

Consumer Society and the Reduction of Object Life Span[132]

As a consumer object, the cycle is inscribed in the current consumer society, in which the life span of material goods is increasingly shortened.

The economist and sociologist Juliet Schor (2010) argues that consumption patterns have evolved drastically in the United States of America since 1960 alongside the development of a dominant culture that she calls "business as usual", which is centred around consumption and a constant desire for more material goods:

> From the perspective of fifty years earlier, when the nation was already very prosperous, the expansion of consumption is also striking. In 1960 the average person consumed just a third of what he or she did in late 2008. Since 1990, inflation-adjusted per-person expenditures have risen 300 percent for furniture and household goods, 80 percent for apparel, and 15–20 percent for vehicles, housing, and food. Overall, average real per-person spending increased 42 percent. (Schor, 2010: 26)

This massive increase in both consumption and the abundance of material goods available in daily life has led to a transformation of the role of material objects in the lives of consumers. Schor argues that the instrumental function of these objects becomes secondary in comparison with their symbolic meaning and the social status with which they are associated. This leads to what Schor calls the "materiality paradox": as material goods become less important, their

[132] I developed this discussion as applied to a study of a cycle workshop on the blog Anthropocène 2050: URL https://medium.com/anthropocene2050/sur-la-possibilit%C3%A9-de-vivre-dans-les-restes-de-la-soci%C3%A9t%C3%A9-de-consommation-7a235f3b0d1e

impact on the planet increases. This has occurred for all types of consumer goods, from clothing to items typically considered consumer durables (such as electronics or furniture). While the figures quoted by Schor apply to the United States, the same trends are at play globally: in both France and Australia, the consumption expenditures of households and non-profit organisations have been steadily increasing since 1960, and tripled between 1960 and 2019[133]. In France, the annual consumption expenditure of households was multiplied by 4.3 in the same period[134].

One effect of this massive and continuous consumption is the overwhelming increase of waste on a global scale (Hoornweg, Bhada-Tata, and Kennedy 2013). Plastic waste, among other types of waste, continues to increase, and developments in recycling and incineration practices have made minimal difference: the cumulative amount of plastic discarded in landfills is expected to reach 12 million metric tons by 2050 (Geyer, Jambeck, and Law 2017).

According to Schor, the problem is not the importance of material goods in this society, but perhaps rather the fact that we do not give them enough care and attention:

> We don't need to be less materialist, as the standard formulation would have it, but more so. For it is only when we take the materiality of the world seriously that we can appreciate and preserve the resources on which spending depends. (Schor 2010: 14).

Schor thus does not advocate against consumption, but instead for a society that places greater value on each consumer good. In her view, we should transform our relationship with material objects to escape the excesses of consumption that occur in our business-as-usual society.

The cycle is also affected by this shift in consumption habits, as evidenced by the shape taken by the cycling market.

---

[133] World Bank National Data (2020): Households and NPISHs private consumption expenditure per capita (constant 2010$) – Australia, France (url: https://data.worldbank.org/indicator/NE.CON.PRVT.PC.KD?locations=AU-FR, accessed June 2021).
[134] INSEE 2020, tableau de bord de l'économie française, « Consommation et équipement des ménages » (URL: https://www.insee.fr/fr/outil-interactif/5367857/tableau/30_RPC/35_CEM#, accessed June 2021).

The Cycling Market

Despite its widespread image as an anti-consumerist object, the cycle is in fact a consumer object. It is often purchased in a shop; it has a price and a market value; it decays and is discarded after a certain period of time. In many ways, the conditions of acquisition of a cycle transform cycling practices. Most cyclists had to make a decision when acquiring the cycle that they use, to think of characteristics that they value in aicycle, and to compare their financial means with their idea of what constitutes a good cycle (Eskenazi 2022). The dynamics of the cycling market thus mediate the cycle–cyclist relationship. Three key characteristics of the cycling market are its very wide range, market segmentation, and the annual changes made to models.

The cycle market ranges extremely widely in price and quality: it is possible to purchase a cycle for only a few dozen euros on websites such as Gumtree (in Melbourne) or Leboncoin (in Lyon). Because of these low starting prices, for many inhabitants of both cities, cycles are, as they should be, an affordable good. Cycles can even be free, as in the case of the Brunswick public cycle, a cycle left on a street in a Melbourne suburb and available to whoever wants it – anyone can take and use it, on the condition that they leave their name and the date on which they borrowed the cycle on a document hanging on an adjacent wall (Figure 4.1). One key aspect of the affordability of cycles is the second-hand market. In this regard, practices in Lyon and Melbourne differ significantly, since Lyon cyclists are substantially more likely than Melbourne cyclists to ride a cycle that was purchased second-hand (50% of Lyon cyclists and 30% of Melbourne cyclists ride second-hand cycles).

Figure 4.1 - Community Bikes, Brunswick, Melbourne – Credit: Faith Hunter

On the other hand, some cycles can cost up to 12,000 euros. The cheapest road cycle sold by Giant, the world's biggest cycle manufacturer[135], costs 1,500 euros. This wide array of prices has given rise to a wide array of cycling and repair practices. As far as repair and maintenance is concerned, some spaces are also devoted to cycles as luxury goods. This is for example demonstrated by the existence of a list inventorying the "world's coolest bike shops"[136]. The existence of this list implies that some cycle shops are "above" others, that cycle repair is a sophisticated craft that most people perform at an average level while a rare few are truly exceptional at it; in other words, that luxurious cycles can best be taken care of through luxury

[135] https://www.cips.org/supply-management/news/2016/january/secret-giant-is-worlds-biggest-bicycle-manufacturer-and-still-growing/
[136] https://cyclingtips.com/2013/05/ten-of-the-worlds-coolest-bike-shops/

cycle repair. The cycle–cyclist relationship and the acquisition of velonomy are therefore mediated by the diverse cycling markets in which cycling occurs: although almost anyone can access a cycle, higher-income cyclists can access cycles with the exact specifications that they prefer, along with spare parts that are tailored to fit their exact needs or desires. For instance, one mechanic described the very high-end components that he was hired to fit into a cycle as follows:

> *- We've been working on that bike, it's had a lot of time spent on it, but also a lot of money spent on it. You know, a crazy amount of money, really.*
>
> *- Is it because of the high-quality components?*
>
> *- Yes, it's like, everything on this is new old stuff. So, you know, like, everything he's been supplying… This was high-end, this is hand-made, top-of-the-line racing performance. And you know, this box alone is worth a couple of thousand dollars. It's the crankset. Everything on that has never been ridden before. So I guess it's like, yeah, a show-piece bike. But he wants to do a bit of riding on it, uhm, you know, which is good. It's meant to be used.*
>
> Dan, owner and mechanic, Melbourne

Another characteristic of the cycling market is market segmentation. Since the stabilisation of its structure and general characteristics following the invention of the safety cycle in 1879, the cycle has undergone innovation at a lower scale, mainly focusing on the transformation of individual components. However, the cycle industry has long maintained consumer interest and a sense of novelty by implementing (as early as the 1890s) market segmentation (Mari 2021).

Market segmentation consists in identifying different categories of customers to whom a specific model of cycle would correspond. In the case of the cycle, this segmentation is performed with reference to gender, age, and cycle usage. The latter is a particularly interesting variable, since, unlike the others, it depends on the purchaser's individual choices:

> Bicycle usage, as a further market segmentation variable, helped bicycle firms to focus

> on the desire of potential cyclists for being part of a community of customers sharing the same interest in cycling. For those cyclists, buying a specific kind of bicycle was a way to be associated with a distinct group of customers, such as the commuters using their bicycle on road, the tourists riding across-the-road, or the racers competing off road. (Mari 2021:84)

Similarly, Cox argues that market segmentation in the cycle market "reflects wider trends within contemporary consumption and its stress on exchange-value over use-value." (Cox 2005:6).

In addition to market segmentation, cycle sales have been supported by annual model changes and the association of cycling with sales, as embodied by the Tour de France (Mari 2021). These annual changes in models present the opportunity for the introduction of new models, in a manner facilitated by the encounters between cycle manufacturers and different cycling subcultures (Rosen 1993). In other cases, such changes offer an opportunity for the cycling industry to foster feelings of novelty among customers, even when the technical characteristics of a new model are almost identical to the previous year's model, as argued by Cox in a study of German cycle manufacturing in the 1920s (Cox 2017).

The case of cycle couriers and their subculture (Fincham 2007), which was partly appropriated by a wider population as a sign of wealth and class (Hoor 2020), illustrates the current evolution of marketing as it relates to cycling: new subgroups related to specific practices emerge, leading to the identification and development of new markets. The growth of the cycling industry can even constitute a motive for the development of a cycling culture, as occurred in Taiwan (Spinney and Lin 2019).

This overview of the cycling market sheds some light on the dynamics of cycle acquisition. However, as argued above, the dynamics underlying the consumer society also manifest in the ways that cycles are appropriated. Thus, one way to explore the effects of the consumer society on velonomy is to study the length of cycle ownership.

Length of Cycle Ownership

The sociologist Alan Warde highlighted the two different understandings of the term "consumption":

> The concept of consumption has two separate historical roots. One emerged from political economy in the eighteenth century to describe market relationships by distinguishing the consumer from the producer. The other, an earlier notion, emerging from Latin into Early English, had a negative connotation – to destroy, to waste, to use up. Use, not acquisition, was primary. The tension between the two meanings drives current public and scholarly debates about modern consumerism. (Warde 2015)

According to this distinction, a comprehensive study of the cycle as a consumer object should discuss the market in which it is acquired, as well as the conditions under which it is discarded.

Cycle ownership is less researched than car ownership, and data on this subject is often unreliable (Mari 2021:40,64). Cycle ownership is associated with positive attitudes regarding cycling, as well as with the availability of cycle parking at the place of residence (Castillo-Manzano, Castro-Nuño, and López-Valpuesta 2015). Cycle ownership is also more common in areas that are less hilly or equipped with better cycling infrastructure (Handy, Xing, and Buehler 2010).

France and Australia have exhibited similar cycle ownership trends over the last decades, with an approximately constant figure of 60% of households owning at least one cycle (Oke et al. 2015). Moreover, between 2007 and 2017, about 4.5% of the inhabitants of each country purchased a cycle[137]. Despite this, cyclists' relationship to new cycles seems to differ in France and Australia. Indeed, Lyon cyclists tend to own cycles for longer than Melbourne cyclists do[138] (Figure 4.2). These two phenomena – a preference for new cycles and for changing cycles often in Melbourne, and for second-hand cycles and for keeping cycles for longer in Lyon – give rise

---

[137] Data for Melbourne accessible at URL: https://www.statista.com/statistics/788362/australia- bicycle-sales/

[138] X^2=18, p=1.2e-04, Crammer's V=0.14

to different cycling consumer cultures in both cities. The length of cycle ownership is also related to the age of its owner, with older cyclists being likely to have owned their cycle for longer than younger cyclists[139] (Figure 4.3).

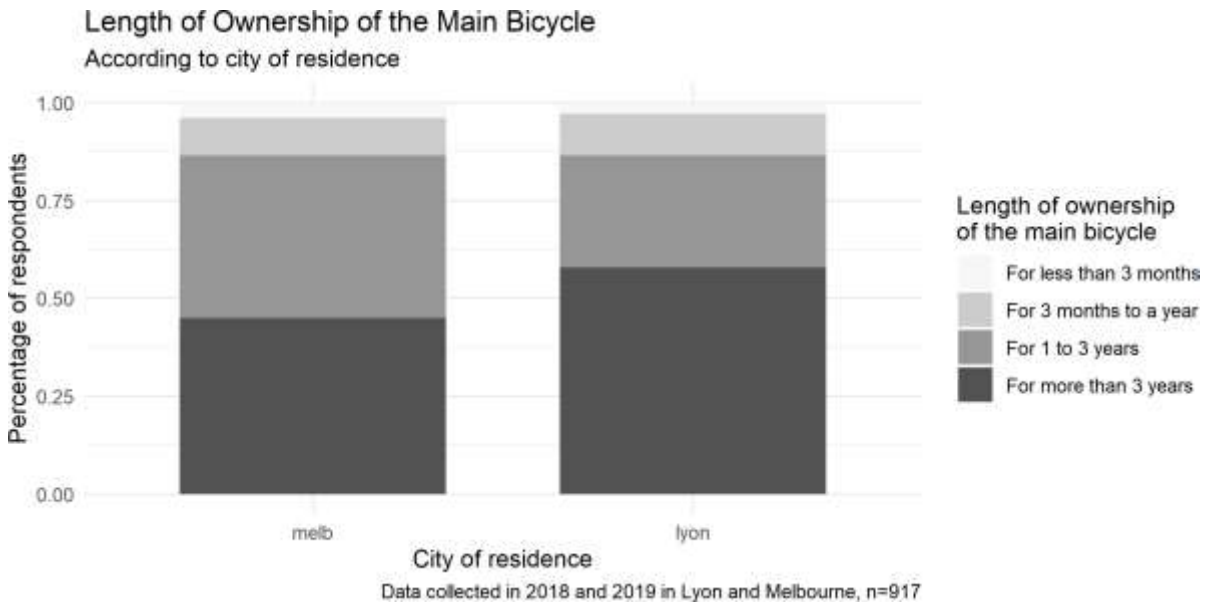


Figure 4.2 - Length of ownership of the main cycle, according to city of residence

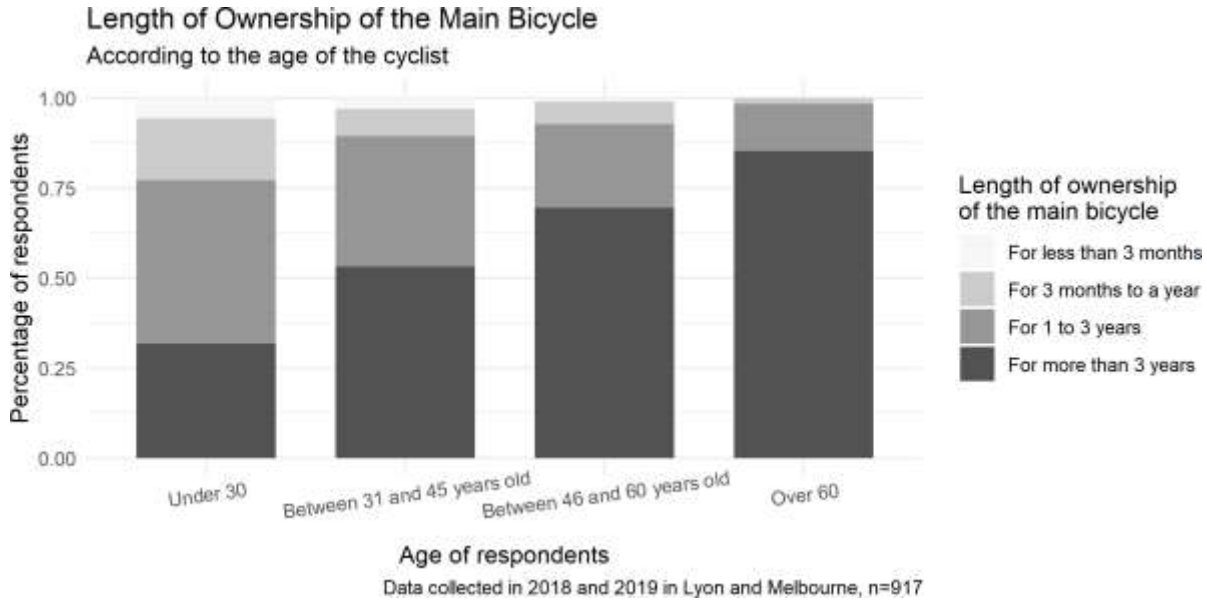


Figure 4.3 - Length of ownership of the main cycle, according to the age of the cyclist

[139] X^2=110, p=5.1e-19, Crammer's V=0.35

The data available does not allow for further exploration of the cycle ownership practices of older cyclists. However, some interviews show that older cyclists, in the course of their cycling practices, are more likely to have found a cycle that they care strongly about or find to be specifically adapted to their needs. This is for instance the case for Sharon, a 56-year-old Melburnian:

> *This bike is the oldest one I've got. I have a carbon fibre 1995 vintage bike, with wires that go everywhere. My dad found it in Queensland, and he said, "you need this bike", and he made me buy it, [laughs] and it's got a Campagnolo 50th anniversary groupset[140], so that's a very special bike.*
>
> Sharon, cyclist, Melbourne

Responses to the cycle repair survey provide a few insights into other determinants of cycle ownership length: cyclists who have owned the cycle that they ride for longer tend to have purchased it new rather than second-hand[141], to own several cycles rather than just one[142], and to be more comfortable with repair and maintenance skills such as chain oiling[143] or brake adjustment[144]. The data does not show any significant link between income and cycle ownership length. Overall, while the available data does not allow for the assertion of any causal link between length of ownership and these different aspects, it does draw a picture of some existing differences between cyclists regarding cycle ownership length.

The cycle, as a consumer object, is inscribed in a market that conditions the ways in which it is acquired; however, the form taken by its use also differs, as highlighted by the study of some variations in cycle ownership length. In order to provide further understanding of how cycles

---

[140] The Campagnolo 50th anniversary groupset is a series of components released in 1983 to commemorate the 50th year of operation of the manufacturer Campagnolo. It is a series of top- range components that were sold in a special carrying case printed with the 50th anniversary logo. More information can be found on the website Redvelo (URL: https://www.redvelo.co.uk/cycling/campagnolo-50th-anniversary-groupset/).
[141] X^2=9.8, p=0.008, Crammer's V=0.10
[142] X^2=33.5, p=9.3e-07, Crammer's V=0.19
[143] X^2=30.7, p=2.2e-07, Crammer's V=0.18
[144] X^2=38.7, p=8.2e-07, Crammer's V=0.21

are discarded, I now focus on planned obsolescence as it applies to cycles.

1.b. The Planned Obsolescence of Cycles

One important element of the dynamics of consumer society that may lead to rapid replacement of a cycle is planned obsolescence. To my knowledge, no previous account of planned obsolescence as applied to the cycling industry has been published. Without being exhaustive, this subsection provides some insights on this topic based on interview data and some of the available literature on cycling technology.

When cycling, people use, and thus degrade, a cycle. This degradation occurs at the scale of the components themselves: some bolts loosen, some metals rust, some materials become more likely to break down when used intensively. A crack in a carbon frame usually necessitates its disposal; riding often leads to the chain loosening; riding for a long time with a loose chain leads to the cogs deteriorating, meaning that the freewheel or cassette must be replaced along with the chain. Cycles also age and rust when they are left unused. Ultimately, this deterioration may make it necessary to discard the cycle. This necessity does not occur outside of the cyclist's influence: it is a social process that results from the cycle design, the cyclist's practices and preferences, and some configurations of the repair ecosystem.

The increasing pace at which consumer goods are replaced has been analysed with reference to the concept of "planned obsolescence". According to Libaert (2015:152), planned obsolescence has three components: technical obsolescence, indirect obsolescence, and psychological obsolescence. Technical obsolescence is related to the technical characteristics of consumer goods, indirect obsolescence is related to the repairability of consumer goods, and psychological obsolescence relates to the shift in consumers' choices regarding how often they choose to replace consumer goods. In this section, planned obsolescence is discussed in more depth. The first subsection is specifically devoted to technical obsolescence. In the second subsection, we discuss aspects of cycle design that contribute to the rapid turnover of cycles. Finally, the third subsection focuses on psychological obsolescence.

Technical Obsolescence

One characteristic of the cycle market and cycle design that contributes to the fast turnover of cycles is the availability of parts. Many cycle shop owners and workers reported struggling with the purchase and storing of cycle components and parts. The extremely high diversity of parts and lack of homogeneity between brands exacerbates this problem. For example, Tony, another mechanic working with second-hand cycles in Melbourne, complains about this issue directly:

> *Often, we tell customers to get parts and to come to the shop with it. But they have to pay more than we would if we ordered ourselves. We don't store many parts because there are so many different models – each bike needs a different set! It is a bit less hard for older models, but just in the catalogue of Shimano 2018, there is in the end a big compatibility grid which is really complicated.*
>
> Tony, bike mechanic, Melbourne

Today, firms that both manufacture cycles from scratch and assemble the end product are very rare; most of the market is constituted of cycle assemblers, who put together frames and components before sale, and component manufacturers. This evolution of the market has led to the domination of two major component manufacturers, Shimano and SRAM (Mikkola 2002; Mari 2021:34). In the course of this research fieldwork, several mechanics expressed feeling dependent of the representatives of both of these manufacturers for acquiring some components.

Professional mechanics also often struggle when attempting to source certain components due to the frequent changes to standards that in the cycling industry. The number of speeds with which manufactured cycles are equipped has continued to increase since the development of the first derailleurs: from two sprockets in the 1900s, to four in the 1920s, to five and more sprockets in 1936 (Hadland and Lessing 2014). This increase accelerated in the 1980s with the introduction to the market of eight-speed cassettes in 1992, which subsequently increased to

nine in 1996, 10 in 2003, 11 in 2012, and 12 speeds in 2019[145]. This regular increase in speeds continuously shifts the standards, leaving cyclists in the lurch when trying to find a replacement for a damaged part, the production of which may have been discontinued[146].

A final issue when it comes to component availability concerns the development of a system of compatibility between parts, something that was first developed by the firm Shimano in the 1980s and 1990s (N. G. Wilson and Hirst 1994; Mikkola 2002). This further restricted the type of components that can be fitted on a given cycle. In France, this issue returned to the public discourse in 2021, with the passing of a law making the availability of spare cycle parts mandatory until five years after commercial sales of this product have ceased[147].

Furthermore, the current focus on faster, lighter materials sometimes occurs to the detriment of durability, as lighter components are often less durable. One example is the increase in the number of speeds described above: increasing the number of speeds requires decreasing the space available for each sprocket and for chain clearance, leading to the use of chains that are thinner and thus less durable.

Despite the development of less durable components, there are also cycling brands that base their brand image on high quality and durability, such as Brookes, a saddle manufacturer that has produced cycle saddles since 1882. As suggested by Cox:

> The leather saddle is immensely comfortable, but also requires breaking in; riding until it conforms to the individual's body shape. Thus, to select a leather saddle is also to display a commitment to continued and regular riding. (Cox 2019: 167)

Marketing processes that create feelings of novelty and encourage frequent product

---

[145] The number of speeds of models produced is accessible on the Wikipedia pages of Shimano (https://en.wikipedia.org/wiki/Shimano) and of SRAM (https://en.wikipedia.org/wiki/SRAM_Corporation).
[146] Cycles equipped with internal gear shifts use standard chain size, but these models are not very common on either the French or Australian market.
[147] Read La Voix du Nord (March 2021): « Vélos : les fabricants vont devoir fournir des pièces détachées pendant cinq ans » (URL: https://www.lavoixdunord.fr/958660/article/2021-03-13/velos-les-fabricants-vont-devoir-fournir-des-pieces-detachees-pendant-cinq-ans, accessed June 2021).

replacement thus co-exist with advertising and preferences that value quality and durability.

Indirect Obsolescence

A second characteristic of planned obsolescence is the reduction in the lifespan of consumer objects through making them more difficult to repair, a phenomenon known as "indirect obsolescence". Cycles are directly affected by this phenomenon. One example pertains to the development of aluminium and carbon frames for cycles, both of which are appreciated by cyclists for their light weight (Hadland and Lessing 2014). These materials made it possible to construct cycles based on shapes that would have otherwise been impossible; another notable advantage is that they do not rust in the way that steel does. However, these two materials are also rather fragile when compared to steel. Aluminium and carbon frames are more likely than steel frames to break down under intensive use. Furthermore, it is almost impossible to repair a carbon frame that has cracked, whereas steel frames can be welded back together when they break. Another relevant technological evolution is the development of electronic groupsets: customers have been drawing attention to the fact that many of them lack repairability, as they require software updates that are not provided by the manufacturer Shimano[148].

The fragility of components depends on the type of manufacturers involved. For instance, there are several major brands renowned for their durability, some of which provide lifetime warranties on the frames of the cycles that they produce[149].

Another aspect of indirect obsolescence is the development of some cycle components that are less durable than traditional components. One cycle mechanic went into more detail when asked about this issue:

> - *When going downhill, it's easier if your seat is low. With a telescopic seatpost, you*

---

[148] « L'obsolescence programmée avec les groupes électroniques sur les vélos » , by Guillaume Robert, published on September 24th 2014 on the blog Matos Vélo (URL: https://www.matosvelo.fr/index.php?post/2014/09/24/L-obsolescence-programmee-avec-les-groupes-electroniques-sur-les-velos).

[149] For instance, the brand Kona provides a lifetime warranty on non-carbon cycle frames upon registration for customers in the USA, Canada, and Europe, as indicated on the brand's website as of August 2022. URL: https://konaworld.com/warranty/

just hit it with your bottom and it goes down. It costs €250 and it's worth it. But it conveniently breaks down after two and a half years – it's under warranty for two years.

- Do you think that this is planned obsolescence?

- Yes. Definitely. Actually, the problem is that there is air and oil, and the seal separating both is rubbish enough to wear after two and a half years. So we fix them – it does not require a lot of tools, the seal costs €30, and it only takes half an hour, but it is a recurrent and systematic issue with every brand.[150]

Julien, mechanic, Lyon

Another example of indirect obsolescence related by the same mechanic concerns plastic ball bearings:

Before, you unscrewed, you cleaned, you greased, and it was working again for a while. Now, instead of being screwed, it's force-pressed. So when it starts to come undone for the same reasons, you need to hit it to take it out – you need to hit it, and since it's PVC, when you take it out it explodes and you have to replace it. And this thing is worth €34. Until now, it was unbreakable. A well-maintained 30-year-old bike will last a very long time. Now, if you maintain a really high-end bike, you'll have a lot of components to replace.[151]

---

[150] « Quand tu fais de la descente, c'est plus facile d'avoir la selle basse. Avec une tige de selle télescopique, tu tapes avec tes fesses et tu descends. Ça vaut 250 balles et c'est rentable. Mais en fait c'est bien foutu, ça tombe en panne après deux ans et demie, c'est garanti deux ans.
- Tu penses que c'est de l'obsolescence programmée ?
- Oui. Complètement. En fait le problème c'est que t'as de l'air et de l'huile, et entre les deux tu as un joint et le joint est suffisamment pourri pour lâcher au bout de 2 ans et demie. Du coup on les répare, il faut pas énormément d'outillage, le joint coûte 30€, tu passes une demi-heure, mais c'est récurrent en fait. Et ça tombe systématiquement en panne, chez toutes les marques. »

[151] « Avant tu dévissais, tu nettoyais, tu remettais un peu de graisse et c'était reparti pour un moment. Mais plutôt que ce soit vissé c'est emmanché en force et du coup quand ça se met à craquer pour les mêmes raisons, pour le ressortir t'es obligé de taper dessus et comme c'est du PVC, quand tu le ressors ça explose et tu es obligé d'en remettre un autre. Et ce truc là ça vaut 34€. Alors que là, jusque-là, ça c'était increvable. Un vélo d'il y a une trentaine d'années entretenu, il durera vraiment longtemps. Maintenant, un vélo vraiment haut de gamme, tu l'entretiens, tu auras plein de pièces à changer. »

Julien, mechanic, Lyon

These two examples show that some areas of the cycling market are oriented towards performance, cost, or convenience, which is detrimental to the durability and reparability of the cycles produced.

Obsolescence and Low-price Cycles

The market of low-price cycles, or supermarket cycles, is heavily affected by the phenomena of technical and indirect obsolescence. This occurs both in Melbourne – where supermarket or "Kmart"[152] cycles are widespread – and to a lesser extent in Lyon, where the market for supermarket cycles is eroded by the strong presence of the multisport retail store Décathlon (Courbe 2020), which offers a range of products with decent quality and affordable prices.

The dysfunctional aspect of these cycles and of their repair is highlighted in a conversation with one mechanic, who describes a type of supermarket cycles with a design fault that both led to breakdowns and impeded potential repair:

> *We got several people coming to us with Aldi bikes, and they all had the same problems with the derailleur. It looked a lot like a derailleur, and it operated like it, but it just didn't work, and that was the way it was designed. Usually they're designed so that when you click it will go as far as a certain distance. With these ones, they just moved, but nobody really bothered trying to figure out whether that was the right distance or not.*

Michael, mechanic and owner, Melbourne

One Lyon mechanic described a very similar experience with supermarket cycles, which he

[152] Kmart is a retailer of electronics, toys, clothing, furniture, and home decor operating in Australia, among other locations.

termed “an absolute nightmare”:

> *It is absolute shit, nothing holds together, the parts weren’t even moulded, they were pressed, I mean… It’s a catastrophe. People buy new bikes for €150 to €200… And I will tell you, these bikes, we can’t even fix them!*[153]
>
> Val, mechanic and owner, Lyon

The faults in these lower-quality cycles appear in a more pronounced way when cyclists ride intensively, thus wearing down every fragile component at a rapid pace. One mechanic describes the experiences of some food delivery riders, who often ride intensively low-quality cycles, as follows:

> *Food couriers, for instance. They ride far too much. They get €100 bikes and they ride them as if they were riding in the Tour de France. After a week, the bike is dead. We see them come back, and I tell my colleague, “Trust me, we’ll bill them for €150.” And it’s always true. It’s a situation that occurs regularly. I tell them, you need a bike that costs at least €600. I look at them right in the eyes, and I tell them, €600. “Yes, but it’s expensive”. Yeah, of course, but you’re a food courier!*[154]
>
> Renaud, mechanic, Lyon

Processes of planned obsolescence thus differ according to the range of the cycles considered.

---

[153] « C'est vraiment de la merde, y'a rien qui se tient, c'est des pièces qui sont pas moulées, c'est des pièces pressées, voilà. C'est une catastrophe. Les gens ils achètent des vélos neufs 150 à 200 balles… en plus je vais te dire, c'est des vélos, on arrive même pas à les réparer quoi ! »

[154] « Les livreurs à vélo par exemple. Ils roulent beaucoup trop. Ils prennent des vélos à 100€ et ils vont rouler comme s'ils faisaient le tour de France. Le vélo, au bout d'une semaine il est mort. On les voit revenir, je dis à mon collègue "ça va pas louper mais là, je suis sûr qu'on va faire un devis à 150€". Et à chaque fois c'est vrai. C'est des cas d'école qui reviennent. Moi je leur dis, faut prendre un vélo à 600€ minimum. Je les regarde bien dans les yeux et je leur dis, 600€. "Oui mais c'est cher". Bah oui mais t'es livreur ! »

Psychological Obsolescence

The programmed obsolescence of cycles is not only technical or indirect; it also has a psychological component. This component appears during the purchase of a new cycle, which is a key moment for both the transformation of cycling practices and the development of velonomy (Eskenazi 2022; Abord de Chatillon and Eskenazi 2022). Psychological obsolescence reflects itself in the "need for new cycles" expressed by some interviewees. It is strongly related to the science of marketing, which aims to satisfy consumer needs (Dibb and Simkin 2001), but which also maintains these needs by identifying, creating, and engaging with specific groups (Giza 2021). The market segmentation and annual model changes widespread in the cycling industry (Mari 2021) thus contribute to making cycle replacement appear necessary to cyclists. This is why cycle purchases are more frequent in some places than in others:

> *People update their bikes quite well here, I find. Actually, they won't repair them, they will buy a new one instead. That's how it happens, mostly. Whereas in Belgium, the bikes… we never sold new bikes*[155]*.*
>
> Karine, mechanic, Melbourne

It appears that cyclists sometimes feel a desire to replace their cycle, despite the problems with it being repairable, simply because they want a new cycle. Under some circumstances, however, this desire for a new cycle can be difficult for the cyclist to articulate or explain. This is why many of the cyclists interviewed identified this search for newness with the idea of "lightness". For example, Mary decided to purchase a new cycle because she wanted to get a lighter one; eventually, however, after consulting the staff at a cycle shop, she bought a cycle that she admits is not lightweight at all:

> *My previous bike was a bit too heavy, I mean, that [new] one is not really lightweight, but it's not as heavy as the other one was. And I probably should look into getting a*

[155] « Les gens updatent leurs vélos assez bien quand-même ici, je trouve. En fait ils vont pas les réparer, ils vont acheter un nouveau. C'est quand-même principalement comme ça. Alors qu'en Belgique, les vélos… on vendait jamais de vélos neufs. »

road bike, I should do more mountains, because I want to do the Camino next year. […] So I think I'll buy a lighter one next time.

Mary, cyclist, Melbourne

Mary consulted at length with friends and salespeople, who assessed her needs based on her cycling practices (urban utilitarian cycling for groceries, and sometimes cycle touring), for which a light cycle is neither a priority nor particularly useful. Following this, they recommended her the cycle that she ultimately purchased and is currently using. Despite this, she continues to wish that she owned a lighter cycle and is willing to change cycles again for that reason.

However, this interest in cycle novelty is not shared by all cyclists: as discussed in Chapter III of this thesis, during interviews, many cyclists expressed a strong sense of pride at having owned the same cycle for a very long time. Most of them were also very annoyed by the breakdown of a cycle that they would need to replace, as well as by the associated expenditure.

To conclude, the cycle is subject to different aspects of planned obsolescence. While some of these factors of obsolescence – such as the reduced availability of spare parts and lack of compatibility among components – apply to the entirety of the cycling market, others apply in uneven and even paradoxical ways. Some renowned brands simultaneously disseminate marketing images that contribute to the development of consumer desire and the emergence of a need for a newer cycle, while also associating high prices with the manufacturing of reliable products. The quest for efficiency and lightness that is a strong part of the marketing argument for these brands is also sometimes detrimental to the life span and repairability of their products. The most recent innovations may improve the reliability of a cycle, but also represent opportunities to introduce new standards in a way that makes the process of repair more complex. Moreover, these innovations sometimes take a long time to efficiently improve the quality of a cycle (for instance, aluminium frames were manufactured with significant faults for the first decades in which this material was in use (Hadland and Lessing 2014:395)).

In their study of discarded cycles in the streets of Copenhagen, Jonas Larsen and Mathilde Dissing Christensen suggest that planned obsolescence is not the main reason for cycle disposal. Instead, they argue that a true understanding of cycle disposal can only derive from a consideration of repair and maintenance practices:

> Cycling, more usually applauded as a sustainable form of transport, can also cause CO2 emissions, clutter in the streets, and waste. This, we have argued, is not because bikes are victims of the whims of fashion and planned obsolescence (as with many other consumer objects) but rather because many people ride cheap bikes that are insufficiently maintained and repaired, and often replaced with a new cheap model within a few years. (Larsen and Christensen 2015:936)

The above arguments contradict Larsen and Christensen's position regarding the way cycles are subjected to processes of planned obsolescence. This difference in positions may result from the geographical context of this study: in the same way that cycle ownership duration and the conditions under which cycles are discarded differ between Lyon and Melbourne, they also differ between both of these cities and Copenhagen, where cycles are more of a common and widespread consumer good. However, it is also true that an understanding of maintenance and repair is key to understanding the conditions of cycle disposal. The next subsection focuses on practices of repair, as they also contribute to uneven market processes.

1.c. Repair as a Merchant Operation

As highlighted in the second chapter of this thesis, people's relationship with their cycles is complex and encompasses a range of aspects, including some that are utilitarian, affective, or symbolic. Many cyclists also associate the cycle with specific values that are important to them, such as environmental values or notions of equity. Cycling is thus perceived by many as a way to engage with a green lifestyle (Horton 2006). However, when cycles break down, the cyclist often has to deal with the commercial cycling market and engage in commercial transactions.

In some cases, the discrepancy between the personal relationship that someone may maintain

with their cycle and the realities of the cycling market may be difficult to stomach. An example of the complex position that the cycle occupies in a consumer society is provided by Luis A. Vivanco:

> Along with emotions like pleasure, shopping often elicits moral tensions and anguish as people realize they're participating in an arena of consumption in ways that contradict their own identities. [...] What "feels weird" perhaps is the contradiction between the notion that a bicycle is a way to simplify one's life and the reality that the bicycle and its accessories are commodities operating in a realm of commercialism and consumption. (Vivanco 2013:51–52)

Indeed, many of the values that cyclists find in cycling, such as freedom and independence – as encouraged by the many advertising campaigns that closely associate cycling with competitive sports (Mari 2021) – appear to contradict the idea of the cycle as inscribed in a market of goods, associated with a price and costs. This contradiction heightens in the case of cyclists who engage with cycling as an action against consumer culture (Furness 2010). Repair and maintenance practices highlight this paradoxical status of the cycle as a consumption object; when maintenance or repair is necessary, cyclists must confront the nature of the cycle as a consumption object, to which is allocated a price, a market value, and sometimes even an expiry date. Points at which repair and maintenance are required are therefore the times at which cycling becomes a costly activity, and the market value of the cycle comes to the forefront.

One mechanic described the shock that she observed in cyclists when they realised that the market value of their cycle was too low to justify an expensive repair:

> *It is difficult to explain to the person that the bicycle they are riding every day is unsafe. Most people, they don't understand this – they think that, well, since it rides every day, it's going well. So when I arrive and say that the bicycle is dead, and that... it is [too] dangerous to be ridden, and that if they want to fix it it'll cost 500 or 600 dollars, people don't understand. We say that it's unsafe to keep riding like that, that they must either service it extensively or replace it as fast as possible. And most of the time, people*

really… they feel… they don't understand, because it's something they use every day, and they feel sad because they have an emotional attachment to it. So it's not always easy. I've had customers who've cried. It is really… for some customers, I think that it's hard because the bike, you use it all the time, you know. It's the freedom machine.[156]

Karine, mechanic, Melbourne

Similarly, many mechanics described the frequent interactions that they had with cyclists who expected repair to be almost free and were shocked by the prices. These experiences are extremely unpleasant for mechanics, who see the price they demand for repairs as fair compensation for the time they spend performing them.

These misunderstandings with regard to pricing may be based on different conceptions of what mechanical repair entails. Several mechanics suggested that many cyclists have very little knowledge about how a cycle works and the maintenance it requires. This phenomenon may explain both why cyclists sometimes refuse to pay high prices for repairs and why mechanics encounter many people riding cycles that are poorly maintained, as described in the second chapter of this thesis. A related phenomenon is also experienced by food delivery riders, who mechanics describe as very surprised to discover the effect of their highly intense riding practices on the condition of their cycle.

This section has explored the specific status of the cycle in consumer societies. Cycles are subject to market processes, such as market segmentation and annual model change, that both

---

[156] « C'est difficile d'expliquer à la personne que le vélo qu'elle roule avec tous les jours n'est pas safe, la plupart des gens ils ne comprennent pas ça, ils se disent que bah, puisqu'il roule tous les jours, il va bien. Donc arriver et dire que le vélo il est mort, et que… il est dangereux de rouler avec, et que si on veut le réparer ça coûte 500 ou 600 dollars, les gens comprennent pas. On dit que le vélo est dangereux d'être roulé, que c'est pas safe de rouler avec et que du coup, il faut soit lui donner un gros service, soit le remplacer le plus vite possible. Et la plupart du temps les gens… ont vraiment… ça leur fait… ils comprennent pas parce que du coup c'est quelque chose qu'ils utilisent tous les jours et ça leur fait de la peine puisqu'ils ont une attache émotionnelle derrière. Donc c'est pas toujours facile. J'ai des clients qui pleurent. Parce que c'est vraiment… Pour certains clients je pense que c'est dur parce que le vélo tu l'utilises tout le temps, quoi. C'est la freedom machine, quoi. »

foster the desire for cycles among certain populations and justify a high diversity of prices in the cycling market. As a result, certain categories of the population keep cycles for longer than others, and the material culture of cycling differs according to cyclists' city of residence, age, and cycling practices. The conditions under which cycles are discarded are related to processes of planned obsolescence, which are in turn fuelled by the frequent development of new ranges of products. Interpreting these processes requires nuance, since they occur concurrently with technical advances in cycle quality, and also vary depending on the quality and price range of the cycles in question. Cycling is a practice associated with freedom and play, but the study of repair practices situates these practices within a socio-economic context. It is common for cyclists to experience the cost of cycling and repair as an unexpected aspect of cycling practices; however, the economic aspect of cycling is an essential element of the role it plays in the urban environment and in the lives of cyclists.

2. Income Inequalities and Velonomy

In a consumer society where repair is often a costly merchant operation, velonomy can be impacted by limitations on cyclists' economic resources. Indeed, income is an important factor in mediating the choice of whether or not one chooses to repair one's own cycle. This section explores the different cycling and repair practices engaged in by cyclists at different income levels.

2.a. Poverty and Mobility Justice in Cycling

Income and Cycling in Urban Areas

Research is paying increasing attention to inequalities associated with mobility practices. In a world where mobility is not an optional resource, but rather a mandatory requirement for all other activities (Orfeuil 2010), lower-income urban residents are often dependent on their cars, own fewer cars per household, and consume far less fuel (Fol 2009). Moreover, although lower-income urban residents consume less fuel, this consumption represents a share of their overall income that is double that reported by people in the highest income quintile (Fol 2009). Furthermore, the poorest urban residents are more likely to own cars for longer periods than higher-income residents, as well as to buy their car on the second-hand market. As a consequence, maintenance and repair costs can be very important for these residents and constitute a real burden (Fol 2009:129). When it comes to moving around via public transportation, moreover, lower-income urban residents are more likely to lack access to the most optimal sources of information on how to get to their final destination (Khedira 2020).

Cycling is becoming a trend in some urban areas, with participation growing most among higher-income and higher-educated people (Adam 2021). The urban policies that aim to foster the development of cycling are often associated with processes of gentrification, as well as with the exclusion of cyclists belonging to marginalised social classes or ethnicities from certain areas (Stehlin 2019). In Paris, as in many metropolitan areas, the strong growth in cycling that has

occurred over the last decades has largely been driven by higher-income and higher-educated people adopting this mode of transportation (Dusong 2021:127). Moreover, the observed reduction in the share of working-class cyclists may be more closely linked with a decline in the share of this population that resides in Paris than any actual decline in their cycling practices, which seem to remain stable (Courel and Riou 2014, cited in Dusong 2021). Lower-income people being left behind by the growth of cycling may also be related to the inscription of cycling into a consumer culture, as discussed in the first section of this chapter.

For the lower-income urban dwellers who do cycle, the affordability of this means of transportation is an important factor. For this reason, the accessibility of cycle repair and maintenance is important for the inclusivity of urban mobility.

Measuring Income Levels and Poverty

This section aims to depict some specificities of cycle repair and maintenance practices among a specific category of cyclists, namely lower-income cyclists (also referred to as poorer cyclists in the remainder of this chapter), as opposed to richer or higher-income cyclists. These cyclists were identified in different ways using quantitative and qualitative methods. For the quantitative analysis, the cycle repair survey facilitated an investigation of the impact of income on cycling practices (and more specifically repair practices) by dividing cyclists into income quintiles. To mitigate respondents' well-known reluctance to respond with exact details when asked about their income level, the question required cyclists to indicate the income bracket in which they found themselves: each bracket represented an income quintile, respectively, for Australia and France. In both cities, it emerged that the majority of the respondents belonged to the highest two income quintiles, which is representative of these two metropolitan areas.

This measure of income is relevant in that it indicates the amount of available resources that individuals have in their possession for their daily activities. An Australian cyclist who earns an average French income may feel like a poor person in Australia; this is why using quintiles allows for thinking about poverty in relative terms, as well as for comparing low-income populations in France and Australia, despite the differences in wages in both countries.

	Melbourne	Lyon
No income	7%	8%
1st quintile	10%	6%
2nd quintile	15%	14%
3rd quintile	24%	24%
4th quintile	24%	24%
5th quintile	29%	28%
Total	100%	100%

Table 4.1 - Table of respondents' income

However, this measure also presents some disadvantages. Indeed, this measure of income may leave aside some other economic factors that affect the lives of cyclists. For example, individual income may differ substantially from household income, as in the case of individuals who share their life with someone earning a higher (or lower) income, a discrepancy that is heavily gendered (Bessière and Gollac 2020). Respondents who report earning "no income" should also be treated with caution, since many of them are teenagers or young students whose way of life is strongly associated with the practices of their richer parents. Another important economic variable that is not included when considering income alone is the overall wealth possessed by the individual. Wealth may differ significantly from income and strongly contributes to economic inequalities in the twenty-first century (Piketty 2013). Moreover, income as a measure leaves aside many non-economic parameters of the lived experience of poverty that are increasingly being taken into account in social science research (Strobel 1996; Hick 2014); for instance, unlike the commonly used French variable of socio-professional categories, it does not include an indication of social status.

For the qualitative analysis, a self-assessment of poverty was used. Thus, the repair and maintenance practices of respondents who mentioned having little money, being poor, or not

being able to afford certain things were investigated in order to understand the impact of lower income on these practices. Self-assessed poverty allows for a reconsideration of poverty, which, in addition to being an objective qualifier, can also be a way for some people to position themselves socially (Lahieyte 2020). The value of self-assessed poverty has been recognised in academic literature as a variable that correlates with many other poverty measures (for instance, with the socio-professional categories of worker and employee; Papuchon and Duvoux 2018).

Employing these two different measures facilitates a fuller understanding of the practices of lower-income cyclists when it comes to repair or maintenance.

2.b. Different Income Levels, Different Cycle Repair and Maintenance Practices

Initial analysis of the survey results indicates differences between the practices of lower-income and higher-income cyclists. These differences arise due to the different choices made regarding cycling equipment and different behaviours engaged in when it comes time to repair a cycle, but also due to differing perceptions of what repair and maintenance entails for cyclists with different resources.

Income Level and Cycle Equipment

David Edgerton discusses different car maintenance cultures in countries of the Global North and South, comparing car maintenance in the USA to that occurring in Ghana; in the latter location, cars deemed to be in bad condition often find a second life with the help of a flourishing car repair industry, which replaces and transforms many mechanical parts of vehicles so that they can be repaired almost indefinitely:

> There was almost daily repair to the local buses and trucks, which provided extremely cheap transport. One reason is that these transports were eternal in their equilibrium position. No one would think to replace one, since they lived in constant interaction with a workshop. Here the economics of investment and depreciation simply did not apply – the costs were those of maintenance and repair (Edgerton 2006:84).

Indeed, when faced with the scarcity of new materials, inhabitants of a particular country often develop very creative and resourceful forms of repair and mending, as in the case of Cuba (Oroza 2009; Middleton 2018). Moreover, within an individual country, income dynamics also exert influence on repair practices.

The cycle repair survey results indicate that richer cyclists are as likely as poorer cyclists to own one or several cycles. However, the type of cycle owned and the motives for ownership differ between these two groups. For instance, several poorer cyclists mention money as a reason for owning a cycle:

> *I have been cycling very regularly for a year and a half, I would say, and on a daily basis for six months, since I cancelled my public transport subscription. Because it was not subsidised by my job anymore, and so I cancelled it because… it was too expensive for what it was. And now I only use my bike.*[157]
>
> Aline, cyclist, Lyon

Data from the cycle repair survey confirms that poorer cyclists are more likely to appreciate cycling as an affordable activity. One respondent in Melbourne stated that "being unemployed for a long time, it was the only way to get around that was affordable". In Lyon, poorer cyclists were also more likely to strongly agree that "riding a bike saves money" (Figure 4.4).

While poorer cyclists tend to invest in less expensive cycling equipment, richer cyclists are often engaged in cycling cultures that require more accessories and higher-end materials. Indeed, they are more likely to own a cycle that was purchased new than a second-hand cycle (Figure 4.5): 75% of people in the highest income quintile own a cycle that was purchased new, whereas for members of the three lowest quintiles, this figure remains at 50%.

---

[157] « Je fais du vélo très très régulièrement depuis un an et demie, je dirais, et quotidiennement depuis 6 mois, en fait depuis que j'ai résilié mon abonnement de transports en commun. Parce que c'était plus remboursé par mon boulot et du coup je l'ai résilié parce que… c'était trop cher pour ce que c'était. Et du coup maintenant je me déplace exclusivement en vélo. »

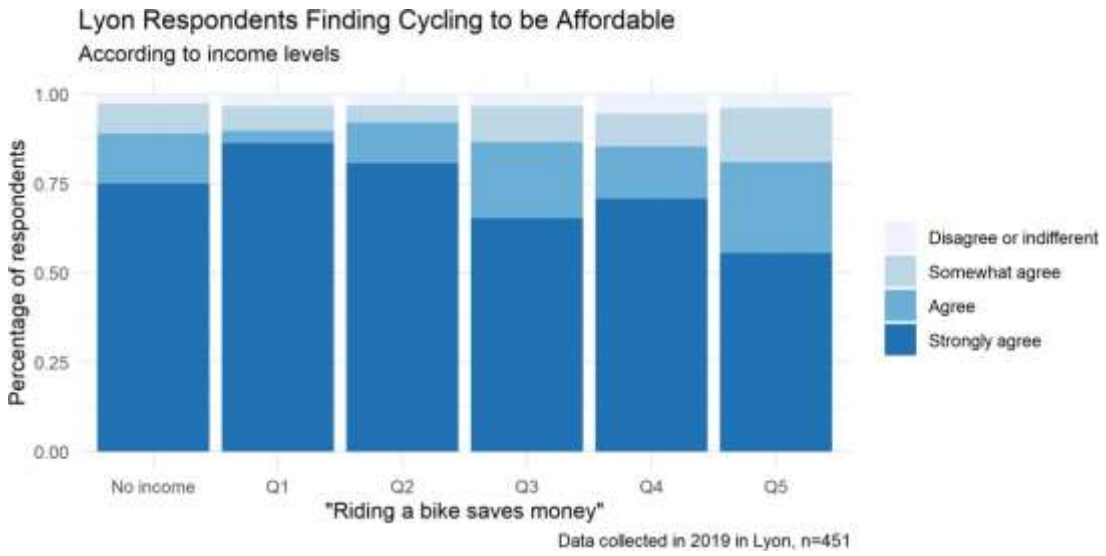


Figure 4.4 - Perceived affordability of cycling according to income quintiles (in Lyon)

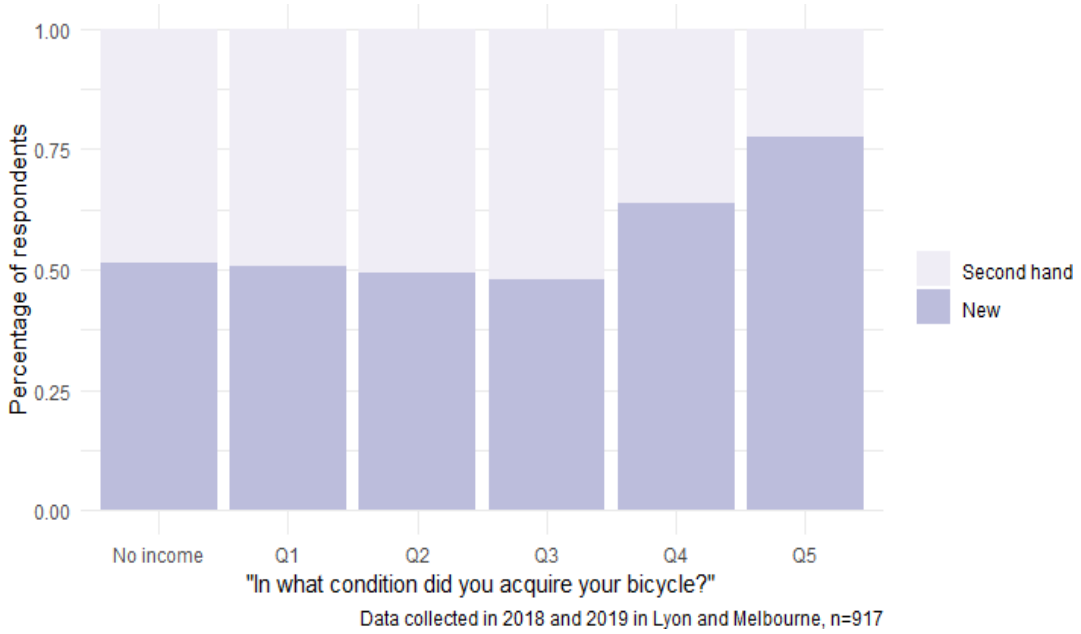


Figure 4.5 - Condition in which cycle was purchased (new or second-hand) according to income quintiles

The fact that richer people are more likely to own new cycles may explain the finding that they also own different types of cycles when compared to their low-income counterparts. For

example, poorer cyclists are far more likely than richer cyclists to own fixed gear cycles; this trend is especially noticeable in Lyon, where a disproportionate amount of low-income cyclists own a fixed gear cycle, while a disproportionate amount of high-income cyclists own an electric cycle[158].

Unlike what was noted by Fol with regard to car ownership (Fol 2009), the cycle repair survey results indicate that richer respondents tend to have owned their cycles for slightly longer than poorer respondents. However, this effect disappears when controlling for age; accordingly, this phenomenon could simply be due to older people being richer on average and tending to own their cycles for longer periods. Unfortunately, the cycle repair survey does not differentiate between cyclists who have owned their cycle for more than three years, which is the case for about 50% of all respondents; we thus lack access to information about the differences between people who have owned their cycle for five, seven, 10, or 15 years.

No clear differences can be observed between the self-assessed condition of the cycles of richer and poorer cyclists. Similarly, it does not appear that income impacts the frequency with which mechanical issues arise, or the type of issues encountered (the cycle part impacted by the last mechanical issue does not differ between income levels). Furthermore, the gravity of mechanical issues encountered also does not vary according to income levels.

One other difference between richer and poorer cyclists concerns their equipment, specifically their tools. Poorer cyclists are more likely to own some cycle repair tools than richer cyclists. This is for instance the case for a spoke wrench, a small tool specifically designed for truing the wheel of a cycle. Interestingly, poorer cyclists are far more likely than richer cyclists to own or have access to a spoke wrench: 48% of cyclists from the richest quintile have no access to a spoke wrench, whereas this is only the case for 26% of cyclists from the poorest quintile. This discrepancy can also be observed regarding chain tools and cycle stands.

---

[158] Overall, 28% of Lyon respondents belonging to the lowest income quintile use a fixed-gear cycle as their main cycle, whereas this is only the case for 3% of cyclists in the highest income quintile. Moreover, 13% of Lyon respondents in the highest income quintile ride an electrically assisted cycle, whereas no respondent from either the first or second income quintile owned an electric cycle at the time of this study.

As we can see, richer people are both more likely to own cycles that they purchased new and less likely to have access to tools to repair them. However, they do not seem to own their cycles for a longer or shorter period than poorer cyclists; neither do they report different types of mechanical issues with their cycle, or different frequencies at which these issues occur. Despite this, some differences can be found in repair and maintenance practices according to income levels.

Income Level and Repair Practices

Cyclists of different income levels behave differently when it comes to repair and maintenance. Lower-income respondents are more likely to participate in the repair of their cycle themselves (Figure 4.6).

By contrast, higher-income respondents are far more likely to go to a cycle shop or to hire a cycle mechanic than lower-income respondents. Conversely, lower-income respondents are more likely to go to a community workshop in order to solve a mechanical issue (Figure 4.7).

These results are aligned with the general practices of cyclists, since higher-income cyclists mentioned visiting cycle shops more often, and community workshops less often, than lower-income cyclists. Even poorer cyclists who do visit cycle shops when they experience a mechanical issue sometimes avoid the same shops when it comes to purchasing additional equipment or accessories:

> *Now I would like to acquire a thing I can put my phone in while riding. I'd also like to add a box on my front luggage rack so that I can carry things. I bought my bike in a cycle shop, but since then I haven't gone to any shop like that, because accessories are really expensive. So I don't go to any of those shops, except when I have a mechanical issue.*[159]

[159] « Là, j'aimerais bien acquérir un truc pour mettre mon téléphone. J'aimerais bien aussi installer une caisse sur mon porte-bagages avant pour pouvoir mettre des trucs. Mon vélo je l'ai acheté à [un magasin] mais autrement je ne me suis pas rendue dans ce genre de magasin… parce que les accessoires sont vraiment chers. Du coup je vais pas trop dans ces magasins-là sauf quand je rencontre un problème. »

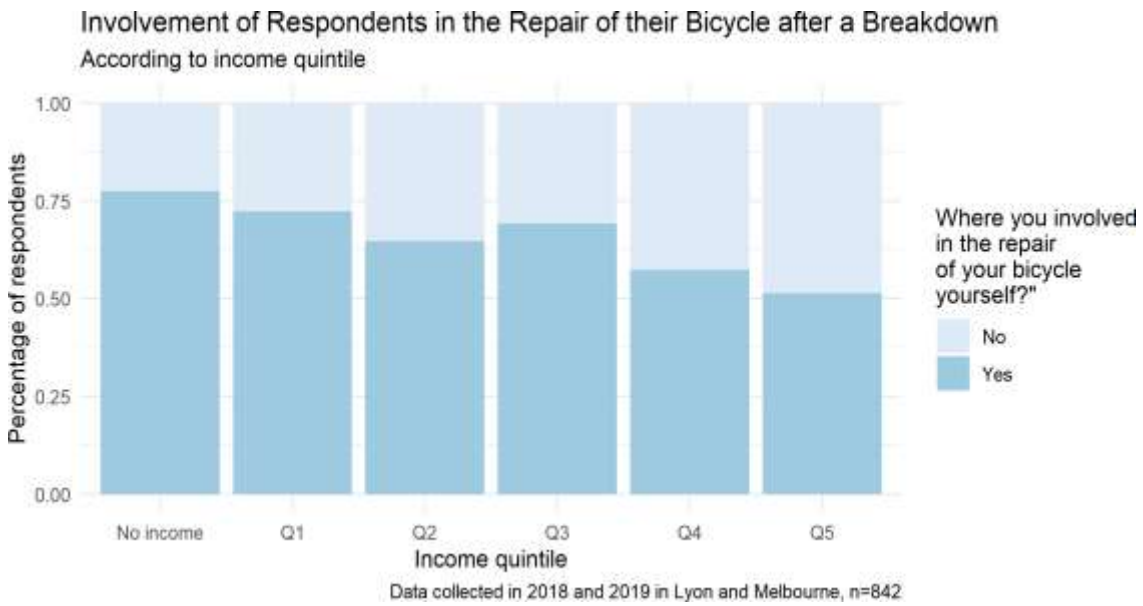


Figure 4.6 – Involvement in the repair of one's cycle according to income quintiles

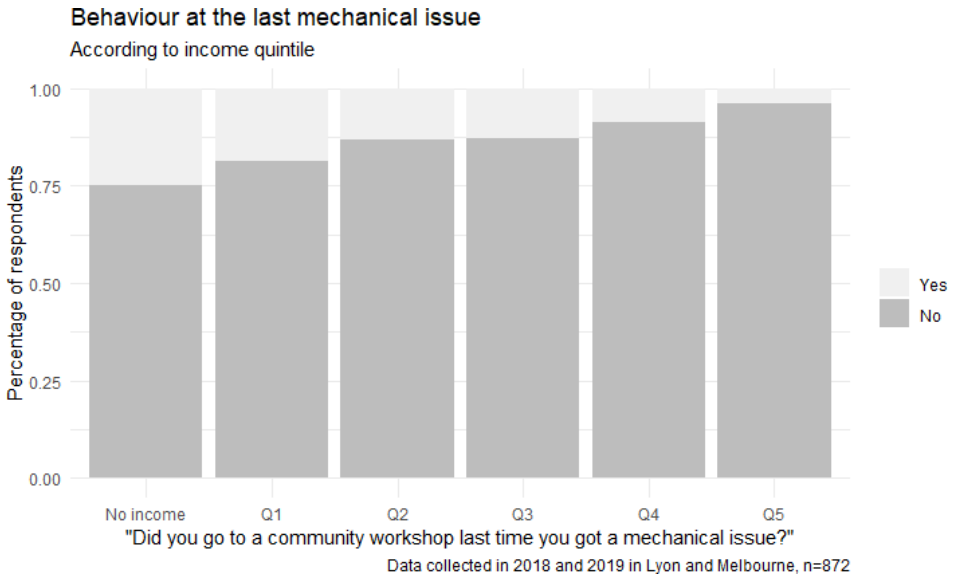


Figure 4.7 – Community workshop attendance according to income quintiles

High prices discourage Aline from purchasing cycle accessories from shops she might otherwise have spontaneously visited. Like many French cyclists, multi-sports stores appear to her as a more affordable alternative to specialised cycle shops.

Finding the Balance between the Cost of Hiring a Professional Mechanic and Performing Repairs Oneself

One reason for the differences in repair practices by income level is that repair is considered by many to be an unpleasant task, or one in which they have no interest. Many cyclists with this approach to repair are happy to hire professional mechanics when they can afford it. For example, Daniel considers that if he can avoid repairing his cycle himself, he is very happy to spend the money that it requires:

> *I can do bits and pieces – my wife is better at fixing things, she's more interested and has more of an aptitude for that. I'm just some lazy middle-class white guy. I'm just happy to hand over my money.*
>
> Daniel, cyclist, Melbourne

While Daniel considers not having to repair his cycle as evidence that he is a "lazy guy", other people decide whether they will perform a repair themselves depending on the situation. The price of repair is compared with how complicated the cyclist estimates the repair would be for them, as demonstrated by Aline's discussion of a puncture repair:

> *I had a puncture once. I thought of how I could potentially change the inner tube myself and all, especially as it was the front wheel, so it's far simpler. And, uhm, actually, when I called the shop to find out how much it would cost to have them do it, and the cost was €17, well, I had them do it. [...] Actually, the price, well, it may seem a bit bourgeois to say it this way, but €17 – if it was €35, I think that I would have thought about it*

differently.[160]

Aline, cyclist, Lyon

On the other end of the spectrum, some people who struggle financially do not consider professional repair to be an eventuality that would be adequate for their situation. To them, earning little or no money means that they are required to choose between repairing their cycle themselves or letting it fall into a dysfunctional state. This is for instance the case for Howard, who does not feel he is skilled at cycle repair at all, but felt compelled to try addressing the mechanical issues himself because of his limited financial resources:

> *You know, if I had been employed younger, I would have done less, I would have had less time and more money and I would have taken my bicycle to the shop. I think everyone should be unemployed at some point (laughs).*

Howard, cyclist, Melbourne

Howard is grateful that his economic difficulties and the free time associated with his unemployment led him to acquire some cycle repair knowledge, but he still does not enjoy repair very much. Unlike Howard, Florian finds cycle repair interesting and enjoys it. Despite this, he too acknowledges the fact that not having a lot of money when he was younger played an important role in him learning cycle repair and maintenance:

> *Then it was mainly the desire to do it myself, because when you are a teenager, you can't always afford bike repair when you break it in one way or another, and I had some interest in repair, so I decided to do it myself to see how it worked.*[161]

---

[160] « Après j'ai crevé une fois, j'ai réfléchi à éventuellement changer moi-même la chambre à air et tout, surtout que c'était la roue avant, donc beaucoup plus simple, quand-même. Et en fait euh, quand j'ai appelé le magasin pour savoir combien ça coûtait de le faire faire, et que ça coûtait 17€, eh bien je l'ai fait faire. […] En fait le prix, après ça fait peut-être un peu bourgeois de dire ça comme ça, mais 17€, en fait si c'était 35€ je pense que j'aurais réfléchi sur… »

[161] « Et après c'était surtout la volonté de faire moi-même, parce que quand on est collégien on a pas forcément les moyens de faire réparer son vélo quand on le casse à droite ou à gauche, et puis moi ça

Florian, cyclist, Lyon

2.c. Different Income Levels, Different Representations of Repair and Maintenance

As discussed in the previous section, lower-income and higher-income cyclists have different cycle repair practices. These are also connected with varying ideas of what repair is and how fulfilling or difficult it is.

On average, richer cyclists tend to find repair slightly more difficult than lower-income cyclists (Figure 4.8).

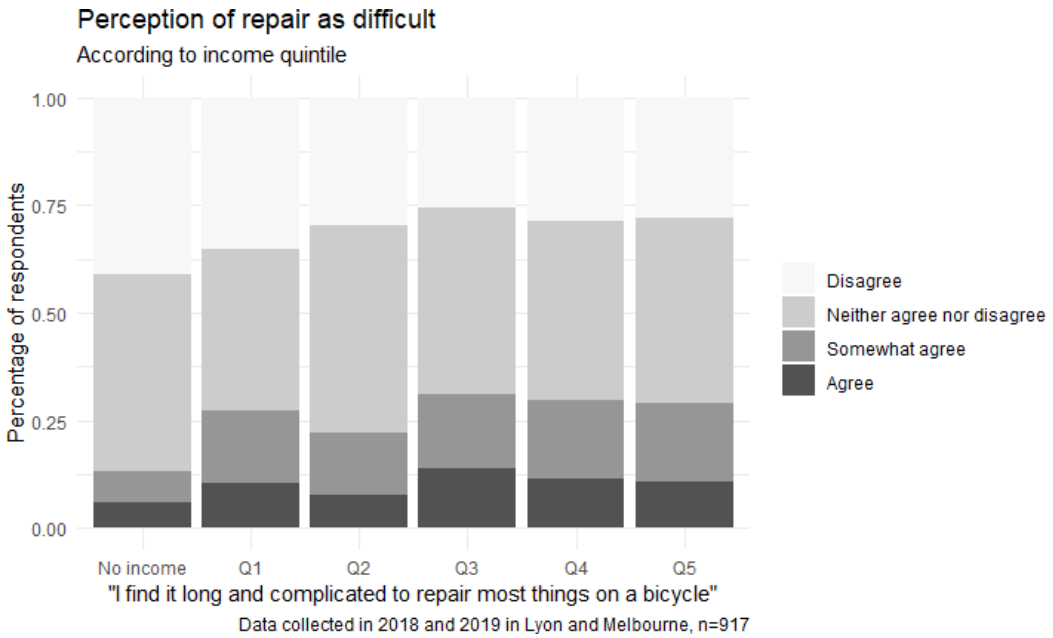


Figure 4.8 - Perception of the difficulty of repair according to income quintile

Being able to afford professional cycle repair changes cyclists' perception of repair itself, along with its difficulty. One example of this is offered by Marie, a cyclist who decided to attempt repairing a cable after realising that it would be expensive at the shop:

---

m'intéressait, du coup j'ai voulu le faire moi-même pour voir comment ça marchait. »

I also checked the fees at the shop, and it seemed quite expensive for the replacement of a cable, or you had to buy a service that involved replacing the whole chain and stuff like that. And so, given the type of operation it was, I told my partner about it, who said, "yes indeed, it's very simple", and so we just did it.162

Marie, cyclist, Lyon

Because she found the price for a repair quite high, Marie decided to investigate how to do it herself, which she would not have done otherwise. Marie's account highlights one of the mechanisms through which poorer cyclists end up both more experienced and more at ease with certain repair operations.

Fear of Professional Repair for Lower-income Cyclists

One declaration frequently made by low-income cyclists with little experience in repair is that they might have considered going to the cycle shop, but their fear of not knowing how much they would be charged dissuaded from even trying. In some cases, cycle repair turns out to be more affordable than expected. However, cyclists sometimes opt to continue riding a dysfunctional cycle rather than risk being asked to pay more than they can afford:

I could take it to a bike shop, but… I don't know how much it will cost me, it may be quite expensive. Or I will ask colleagues who cycle too, they may be able to inform me about it. But I don't know all of the stuff you need to know to repair a bike.[162]

Léonard, cyclist, Lyon

While some lower-income cyclists were encouraged to engage with repair and developed

[162] « Je peux l'emmener dans un magasin de cyclisme, mais… je sais pas combien ça va me coûter, ça risque d'être assez cher, ou je vais voir des collègues qui font du vélo aussi, ils pourront peut-être me renseigner. Mais je connais pas forcément tous les trucs pour réparer son vélo. »

skills, those who still have limited repair skills remain dependent on other people's advice and compelled to pay professional repair prices. The velonomy of lower-income cyclists thus differs substantially depending on their repair skills.

Low-quality Materials and Tricky Repairs

Another phenomenon that transforms the experience of low-income cyclists is the availability of low-quality cycles that can deteriorate rapidly: some of these are supermarket cycles, the poor quality of which was discussed in the first section of this chapter. Some of these low-price cycles are designed without any regard for their repairability, and mechanics often find them extremely difficult or even impossible to repair.

Aside from these low-price cycles, another way to find an affordable cycle in Melbourne and Lyon is to purchase it second-hand. However, cycles that were not purchased new are often more exposed to potential mechanical issues. This was for instance the case for Léonard, who began to worry about the mechanical condition of his cycle only three months after purchasing it second-hand:

> *I bought it second-hand, so it's not very new. I think it may be something like seven or eight years old. One wheel is buckled, yeah, and it's got loose spokes. I also have a back brake that's out of alignment. I mean, I don't know if it's because the back wheel is buckled, or… but I realised that one brake was rubbing against it.*[163]
>
> Léonard, cyclist, Lyon

In both cases, lower-income cyclists who are unable to assess the quality of a cycle are making a bet on the quality of the cycle they purchase, whereas higher-income cyclists can afford not to know exactly what constitutes a good-quality cycle before making a purchase.

---

[163] « Parce qu'il est d'occasion, donc il est pas tout jeune. Je pense qu'il a bien peut-être 7-8 ans. Il a une roue voilée, voilà, il a des rayons détendus. J'ai aussi le frein arrière du coup qui est désaxé, enfin je ne sais pas si c'est parce que la roue arrière est voilée ou… Je me suis rendu compte qu'il y avait un frein qui frottait. »

On the other hand, cyclists who purchase cycles second-hand and are also experienced in repair often find themselves with a lot of maintenance work to do. For example, Olivia, who assembled her cycle herself from second-hand parts, reported that she needs to maintain it more regularly than if she had purchased it new:

> *I got that brand new, and all the cables. Apart from that it's all second-hand materials, even the tyres. And that's another reason that often things will, you know, start to be a problem, and then I have to fix it again. With second-hand parts again. That's like the cycle of my whole life. Things keep breaking because I don't buy new ones, and then I replace it with second-hand things. I say, "there's so much second-hand stuff, why do we need to buy new things?". But then I wonder why my clothes are falling to parts within months, and then I remember, "oh yeah, it's because you already bought them with holes in them".*
>
> Olivia, cyclist, Melbourne

Olivia is not unduly bothered by needing to regularly maintain her cycle. However, other cyclists in her situation may grow frustrated by the frequency with which their second-hand cycles fall into disrepair. Once again, lower-income cyclists are exposed to different repair and maintenance issues than higher-income cyclists.

Different Relationship to Time

Several lower-income cyclists developed a creative attitude towards repairs: they keep old cycles and cycle parts in their flats, houses, or sheds, so that if they have a mechanical issue, they can repair it with one of these spare parts. This strategy demands a lot of space, and was thus made easier in Melbourne, where people are more likely to live in houses with attached outdoor areas. It also requires a different relationship to the time that a repair requires:

> *Yes, there's a couple of bikes under that tarp. Because I don't like my bike, I found other bikes – someone left them, and I wanted to put them together, but the frame and the*

derailleur didn't match, so I kinda never followed up with that project. I still want to get a better bike. It gets tiring. Losing speed all the time, and picking it up, it gets tiring. So I keep my eye out for bikes that have been abandoned. They're mostly pretty shit, but occasionally there's a good one to be found.

Howard, cyclist, Melbourne

Howard initially wanted to assemble two different cycles that he found on the street into one, better cycle, but found he was unable to do so. He is now hoping to find an abandoned cycle in the street – while he acknowledges that the odds of this happening are rather low, as someone with a very low income, it seems to him a better option than purchasing another cycle. As a result, he has been riding an uncomfortable cycle for years.

Another cyclist, Bill, has a similar approach to repair: he was content with a cycle that did not work perfectly until, two years later, he found a cycle in the street with the right parts to repair it:

The gear shift broke, so I just put down a different gear shifter on the bar to fix that, and that was okay for a couple of years. And then I saw a bike that someone had thrown away, and it had the same gear shifters as my first one, so I thought, "ah, that'll fix it". So I got that and switched over the parts. Now it's got the two original shifters, which I like.

Bill, cyclist, Melbourne

Overall, low-income cyclists who choose not to purchase cycle parts in cycle shops experience repair differently: as a time-consuming process occurring over a longer timespan than it would have otherwise.

2.d. Lyon and Melbourne: Two Cities where Income and Repair have Different Meanings

Most discussion in this chapter thus far seems to indicate that the consumer society in Lyon and in Melbourne has similar consequences in both cities when it comes to maintenance and repair practices. However, there are in fact many differences between the cities in this respect, an analysis of which supports the development of a more nuanced account of the relationship between income and repair practices.

A comparison between the economic conditions of repair in France and Australia should take into account the differences in wages and prices in both countries. Prices and incomes are higher in Australia; in 2016, the average annual wage of Australian mechanics was AUD 43,000 (or €28,905) (Bourke 2016). By contrast, a 2009 report suggests that the annual wages of professional French mechanics are close to €12,000, or half that of their Australian counterparts, with the highest wages in the industry nearing €21,000 (Mercat 2009). These higher incomes also lead to higher prices in the repair industry, which is very labour-intensive (Dant 2010).

A comparison of price levels, exchange rates, and median income shows that, when taking purchasing power into account, Australian wage-earners are on average 15% richer than French wage-earners. This corresponds to roughly one quintile of difference: French cyclists in the third income quintile are as rich as Australian cyclists in the second quintile of income. Thus, low-income cyclists in Melbourne are less poor overall than low-income cyclists in Lyon, meaning that they can afford more services and goods[164].

However, the differences observed between the practices of Lyon and Melbourne respondents according to their income are stronger than this one-quintile difference. Data from the cycle repair survey show that repair practices depend on income in very different ways in both cities. Attitudes to second-hand cycle purchase, the frequency of visits to cycle shops or community workshops, and the frequency of servicing one's cycle fluctuate in different ways according to income in Lyon and Melbourne.

[164] Further calculations related to income and purchasing power can be found in the Appendix of this thesis

For instance, although richer people are more likely to own a cycle purchased new than one purchased second-hand, this trend is more evident in Lyon (Figure 4.9); in Melbourne, high- and low-income cyclists are equally likely to own a cycle that was purchased new (Figure 4.10).

Similarly, the phenomenon of frequency of visit of cycle shops, that was discussed above as strongly determined by income levels, differs markedly between the two cities. The difference between the cycle shop patronage patterns of poorer and richer cyclists is far greater in Lyon; in Melbourne, the richest income quintiles have only a slightly higher likelihood of frequently visiting a cycle shop (Figure 4.11).

In both cities, low income is correlated with more frequent visits to community workshops. However, this is more the case in Lyon, where these workshops are a more widespread resource, than in Melbourne (Figure 4.12).

Another practice that is adopted at similar rates by all Lyon cyclists, but that fluctuates according to income in Melbourne (Figure 4.13), is getting one's cycle serviced. In Melbourne, service deals are a more widespread option in cycle shops than in Lyon, where "getting a service" is often understood as a synonym for cycle repair in general. This difference in vocabulary could be the reason for these differences in attitudes expressed towards cycle service.

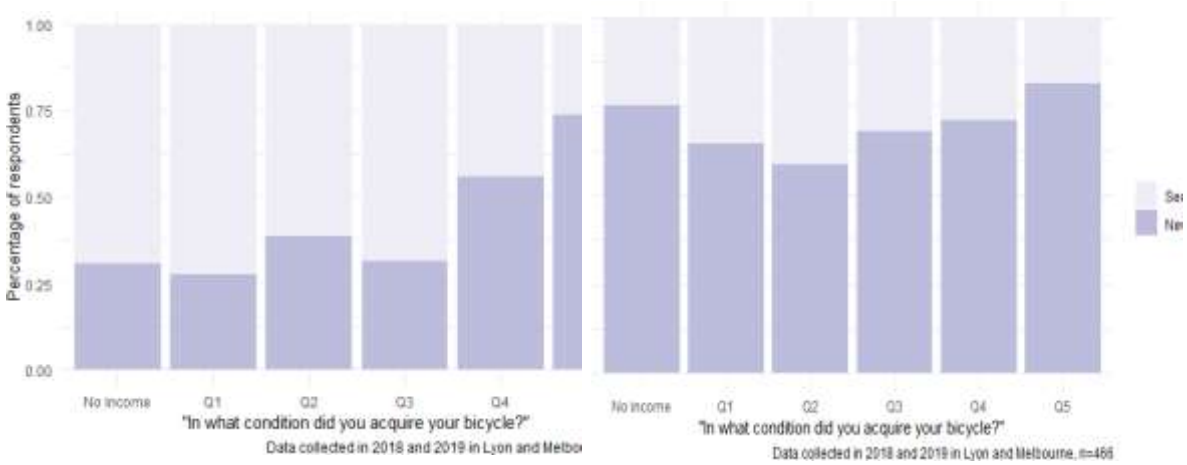


Figure 4.9 - Percentage of second-hand cycle purchases according to income quintile in Lyon

Figure 4.10 – Percentage of second-hand cycle purchases according to income quintile in Melbourne

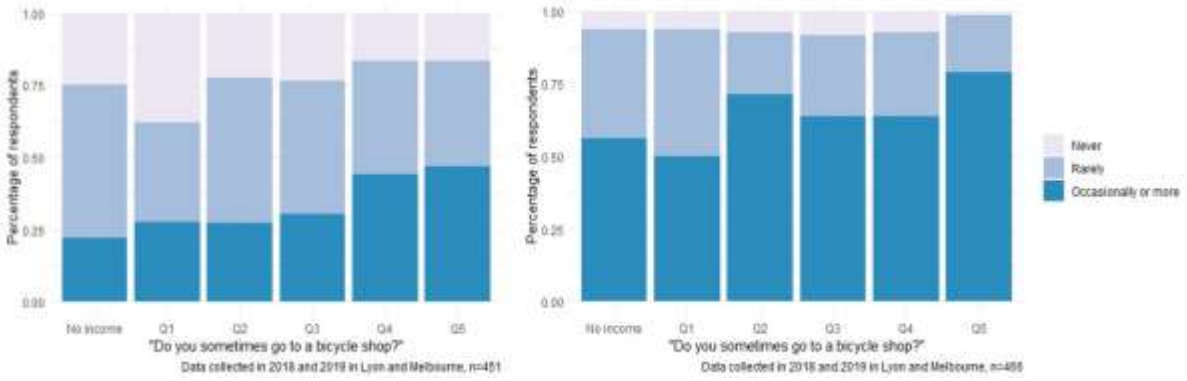


Figure 4.11 – Cycle shop attendance according to income quintile in Lyon (left) and Melbourne (right)

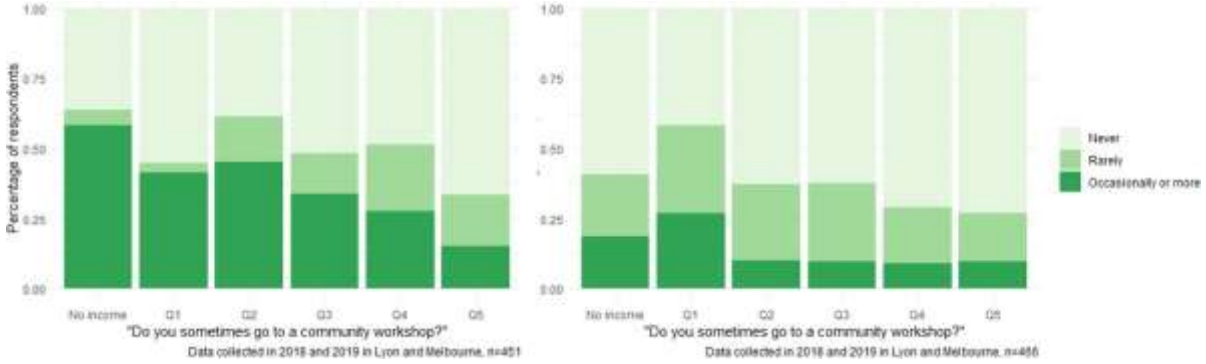


Figure 4.12 – Community workshop attendance according to income quintile in Lyon (left) and Melbourne (right)

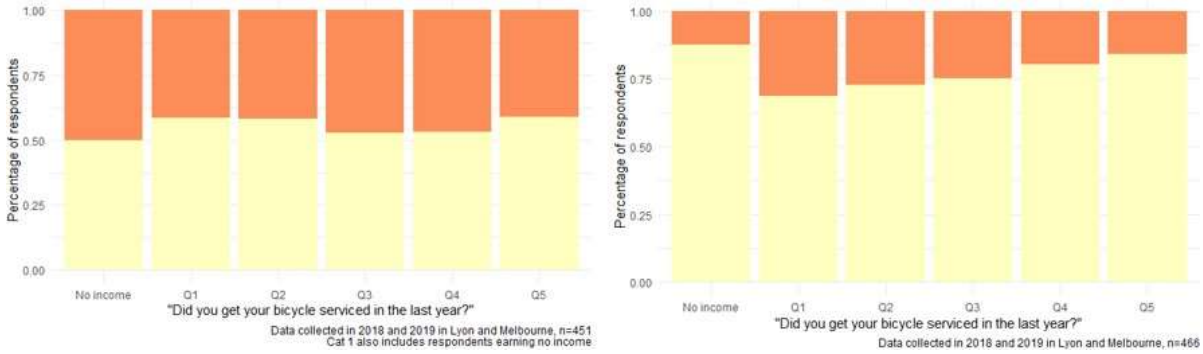


Figure 4.13 – Percentage of cyclists who got their cycle serviced in the last year according to income quintiles, in Lyon (left) and Melbourne (right)

In many ways, Lyon cyclists report repair practices resembling those of the poorest cyclists of Melbourne. Reciprocally, the repair practices of Melbourne cyclists can be compared with the practices of the richest cyclists in Lyon. As a result, some practices are income-dependent in one city but not the other. This echoes one remark made by a mechanic who started working in Melbourne after living in both France and in Belgium. The transcultural experience of this mechanic led her to remark that Melbourne cyclists behaved as if everyone was rich:

> *People, they are rich here! I shouldn't be saying this, but people are really rich! And actually, they don't have this awareness of repair. They throw one cycle away and then buy a new one. Really. I find it shocking.*[165]
>
> Karine, mechanic, Melbourne

As argued above, the structure of income and prices in each country explains part of this strong difference in repair practices between Lyon and Melbourne, but not all of it. The cultural relationship to consumer goods, the availability of community workshops, and a widespread culture of cycle servicing are some of the elements that can further explain this difference. Each urban environment provides cyclists with different resources for cycling and repair, which also gives rise to different experiences among cyclists who earn lower or higher incomes.

In this section, I explored the differences in velonomy that arise as a result of income inequalities. This has highlighted some specificities of the experiences of low and high-income cyclists regarding their repair practices. Notably, it is important to be aware of the context in which these specificities are inscribed: low-income cyclists with limited repair skills are less velonomous, since they struggle to diagnose mechanical problems or perform repairs themselves, although developing these skills would help them to avoid paying high repair prices. Moreover, cyclists at various income levels engage in very different practices depending on their city of residence. While part of this discrepancy is due to the higher average income of

[165] « Les gens ils sont riches ici ! ça il faut pas dire mais les gens ils sont vraiment riches ! Et en fait ils ont pas cette conscience de réparer. Throw and buy a new one, quoi. Vraiment. Moi ça me choque. »

Australians, another difference that may explain this observation is the difference in the resources provided in each city. The ways in which spaces of repair and maintenance are configured affect the velonomy of cyclists in each city.

The next section of this chapter focuses on the cycle repair ecosystem, and particularly on the conviviality of this ecosystem – in short, on how the spaces and resources provided to cyclists for repair allow them to become velonomous.

3. The Velonomy of the Cycle Repair Ecosystem

The previous section described the various maintenance and repair practices of high- and low-income cyclists. In many cases, this diversity of practices means that the velonomy of cyclists is restricted based on their income. Indeed, low-income cyclists are afforded fewer repair options and are more dependent on the acquisition of repair skills, as well as on the repair resources available in their direct environment.

In the previous chapter, I introduced velonomy as a characteristic of the cycle–cyclist relationship that can be fostered by the cycle itself, by cyclists, or by different elements of their environment. A velonomous city is one in which the resources made available to cyclists enable all cyclists to use cycles in ways that align with their individual and collective goals. The embedding of cycling and repair practices in a consumer society also introduces inequities within the cycle–cyclist relationship, some of which are mediated by cyclists' income level.

This section will now focus on different spaces of repair – as they are positioned within market dynamics, and as they contribute to transforming the cycle–cyclist relationship in different ways.

3.a. Towards a Repair Ecosystem

In each city, there are different spaces in which repairs are performed by professional or amateur mechanics, which operate according to different rules, at different prices, and with different degrees of cyclist involvement. These spaces are involved in numerous interactions, and thereby constitute an urban ecosystem of repair.

The term "ecosystem", which originates from the field of biology, was first used in a management context when James Moore (1993) coined the term "business ecosystem". A business ecosystem is an economic community, constituted of heterogeneous actors, who share certain objectives and evolve together over time.

Moore describes the business ecosystem as being organised around one lead firm. This concept was only developed in academic discourse in management over the following decade; its

boundaries and links with biology continue to be debated in an academic context (Fréry, Gratacap, and Isckia 2012; Koenig 2012).

A characterisation involving the concept of a "lead firm" does not really apply to the ecosystems of repair that were investigated in the course of this thesis in the cities of Lyon and Melbourne. Furthermore, some of the research lenses adopted by management researchers when discussing ecosystems (such as a focus on innovation, or on the strategic decisions made by each actor aiming to prosper in an ecosystem) are not relevant here. Despite this, the term helps to facilitate a better understanding of the contexts in which repair practices take place. Indeed, it situates the existing spaces of repair and maintenance in a city as having similar goals and interests, but different ways of functioning, jointly co-evolving according to different public policies and trends, and striking a balance between practices of cooperation and competition (Pellegrin-Boucher and Gueguen 2005).

In the cycle repair and maintenance ecosystem, we can identify many different actors and spaces that have been previously introduced in this thesis: these include cycle shops, community workshops, cycle and component manufacturers, multi-sports stores or supermarkets, and informal spaces such as the backyard of a handy relative. Moreover, "cycle shops" is a category encompassing a highly heterogeneous range of shops, including independent local shops, chain retailers, and mobile mechanics (who are either loosely affiliated with a brick-and-mortar cycle shop or have no such affiliation). Furthermore, while cyclists often discuss their issues with the specific person in a shop who will repair their cycle, the cycle may also be taken to a warehouse located further away from the city centre. Two independent local shops of a similar size may differ significantly in terms of the ways in which customers are welcomed and repairs are performed (for instance, because they target different customer bases). Community workshops also exist in a variety of different forms.

The next subsections explore several characteristics of this ecosystem; the first of these characteristics is complementarity.

Catering to Different People, Cycles, and Needs

Spaces and actors in the cycle repair and maintenance ecosystem do not compete directly with each other. In fact, they often complement each other by providing different services and resources to different people. For instance, an earlier subsection explored how community workshops and cycle shops are spaces visited by cyclists of different income levels. This is not their only difference: they also provide services that are very different in their nature. Th were described precisely by mechanics who had previously moved from one type of shop to another. For instance, several mechanics who transitioned from working/volunteering for a community workshop to working professionally in a high-end shop described the very different tasks that they were asked to perform in both settings:

> *If there is something that we kind of suspect that we can fix, but there is a bit of a risk, we never take the risk. Because that bike might be worth ten thousand dollars. Whereas, at the bike co-op, someone might have just gotten a bike for free and they can hardly ride it, so you just do all the kind of risky stuff that you don't really know is gonna work. Or you're just trying to get the bike to be rideable. In the bike shop, it's more about them riding as smoothly as they possibly can. Which can be a little bit more difficult in terms of the mechanics of it, because you have… there's more of a fine-art kind of understanding of what's happening with this bike that means that it's not 100% smooth. Rather than like, "I'll do this quick easy fix that means that the brakes are not rubbing on the wheel".*
>
> Rosa, mechanic, Melbourne

Mechanics in high-end cycle shops are expected to work differently than those in community workshops: instead of practical repairs, they often have to perform fine-tuned services. To some extent, this difference is mechanical: some cycles require, or allow, finer settings than others, while some come into the shop in a different condition than others. However, the difference is also social, as the owners of higher-end cycles tend to have different expectations for them: some want their cycles to be able to change gears extremely swiftly, a level of

precision highly appreciated in road cycling, or want to be able to adjust their gears and brakes as they loosen the dedicated screws without having to tighten the cable itself. Another striking difference between the two types of shops is cosmetic, as the attention to detail, as well as to the appearance of the cycle, can vary substantially:

> *One thing that I have now fully accepted is that the logos should be aligned. In general, we don't have to take the tyres off, but the tyre logo should be at the level of the valve, and in theory with the disk it's the same. You know, steering systems with stems… There are often caps with logos. Well, it's the same, they must be aligned. The spacers, too… they must be perfectly aligned. It should be really clean, you know, all perfectly aligned.*[166]
>
> Pierre, mechanic, Lyon

Locating Oneself within the Repair Ecosystem

My investigation of cycle repair and maintenance spaces has revealed that, in many cases, actors in the repair ecosystem have a very good understanding of who the other actors are and the differences between them. In short, they are highly aware of their position in the cycle repair ecosystem, something that they mention when talking about the specificities of their work:

> *All I do is service road bikes. It's generally high-end, or vintage, or collectible – something that's a little bit different from what a normal shop would do. I have a range of customers, but generally they're all enthusiasts, they've got a reasonably big disposable income… I think my service is fairly specific. Although I don't think it's expensive compared to other shops, because I set up my business differently. The shop next door looks really great. But do they actually know what they're doing? I would say no. And more often than not, they don't do repairs, they'll just sell you new stuff. So if*

[166] « Un truc que maintenant j'ai complètement accepté c'est qu'on aligne tous les logos. Les pneus en général on a pas à démonter mais effectivement il faut que le logo de pneu soit au niveau de la valve, le disque c'est pareil théoriquement. Tu vois les systèmes de direction avec les potences… les bouchons il y a très souvent des logos, bah pareil il faut qu'ils soient alignés. Pareil sur tes entretoises… là ils doivent être tip top alignés. ça doit vraiment être propre quoi, aligné nickel. »

gears don't work, they'll sell you things rather than fix the problem. And I find it's pretty much the case across the board. Unfortunately, I tend to get people at the end of their experience. So they've been to a shop, and they've just had enough, and they find me.

Ted, owner and mechanic, Melbourne

Although not all cycling shops pride themselves on being the shop where cyclists go after having received bad service elsewhere, most shops mention some specific operations for which they are valued within the repair ecosystem. This is not only a focus of high-end shops; some more affordable repair spaces, like community workshops, also find pride in the things that they do better than any other shop:

We had a young boy come down to the workshop last weekend. He had essentially a supermarket bike, and the pedal had been ripped off from its thread of the crank, and we were trying to get the crank out, it was really hard – and eventually Pete came along, just looked at it and said, "we'll just rethread the pedal". And there was quite a lot of effort that we did to take the crank off and to get the pedal off, because it was really tight because it was so badly threaded, and eventually, you know, there was the crank back on with a new pedal, and we said, "well, it's five dollars". And he stayed there, going, "the bike shop said I needed a brand-new bike, that it was unfixable. Completely unfixable." Yeah.

Walter, community workshop volunteer

Walter prides himself on being able to help workshop visitors in ways that expensive shops cannot; because of the high labour costs involved in cycle repair, most cycling shops consider repairs that entail working for a long time on the cheapest cycles to be "impossible". What they mean by this is that it would be more logical to purchase a new cycle than to perform these repairs professionally. Self-repair workshops, by removing these labour costs, make some of these repairs "possible" again. The example given by Walter – a cyclist finding that his cycle

was in fact repairable (although the repair required several hours of difficult work), after having been told earlier that it was not – is a striking example of the different value that the same cycle may have in different spaces in the repair and maintenance ecosystem.

Navigating the Repair Ecosystem

The relationships between different actors in this repair ecosystem reveals the existence of many links between them. Different spaces of repair lend tools and parts to each other, send customers to each other, and express other forms of solidarity.

One widespread idea is that new shops compete with each other. However, very few owners and mechanics seemed to believe this to be true. Most professional mechanics I interviewed were struggling with the high demand for their services, with many of them having to reject some customers for this reason. This high demand faced by cycle repair professionals also presented a difficulty when it came to conducting interviews, and was a reason why these interviews were sometimes repeatedly interrupted by customer walk-ins and phone calls. However, this lack of competition between mechanics also contributes to their lower degree of concern regarding where exactly their customers choose to go for repairs. This issue sometimes arises when mechanics decide to offer repair and maintenance classes, as Sam did:

> *So then, people are like, "well if you teach them to fix their own bikes, they're not gonna come to you", but I say, "yes they will, because they're gonna come get parts, or that kind of stuff".*
>
> Sam, owner and mechanic, Melbourne

Cycle shop employees are thus often happy to refer customers to other shops when a cycle brought to them does not appear easy to repair:

> *On regular bikes we can almost do everything, but on old bikes, or on specific models, we can't do anything. I know a shop that works on old bikes – I send him a lot of people, you know. I've got plenty of people showing up with old bikes. It's a pleasure for me. I*

tell them, "Ladies and gents, I like you, but I won't be able to do anything with your bike." "Why?" "I don't have the parts for that. But I do know a guy, and he's the best."[167]

Renaud, mechanic, Lyon

One form of solidarity within the cycle repair ecosystem occurs between shops and community workshops: since workshops specialise in second-hand cycles and parts, which many shops do not want to use in their business, it is quite common that shops will give used parts to community workshops as part of an agreement:

We used to do it differently, we used to think we could recycle way more than we actually do. But as we went, we realised that restoring the wheels could take up to half a day – so much labour! So now we systematically replace them. We sort them into reusable and non-reusable, and donate the reusable ones to [the local community workshop].

Michael, owner and mechanic, Melbourne

It is thus common for community workshops to receive bits and pieces that nearby shops or other professionals want to dispose of; for example, one Lyon community workshop was gifted a whole pallet of front-wheel mudguards, which they used to equip most of the cycles that they sold, assembling two of these mudguards together to form a (longer) mudguard that would also fit on the back wheel. In addition to these material exchanges, cycle shops will sometimes also advise each other, while some mechanics learn the ropes at a particular shop before setting up their own shop elsewhere in the city:

Initially, Erwan was someone who tinkered with his bikes – he assembled fixies and all.

---

[167] « Sur les vélos classiques on peut quasiment tout faire à 99%, mais sur les vieux vélos, ou sur certains modèles de vélos, on peut rien faire. Je connais un magasin qui fait les vieux vélos, moi je lui envoie plein de monde, hein. J'ai plein de gens qui arrivent avec des vieux vélos. Moi c'est un plaisir : je leur dis "messieurs-dames, je vous aime bien mais je vais rien pouvoir faire sur votre vélo". "Pourquoi ?". "J'ai pas les pièces. Par contre je connais un gars, il est top du top". »

And I was going through some complicated times, I had a huge amount of work. So I asked Erwan to come and work with me. He already knew the basics, then he learned some things, I learned some things with him, and in the end, it allowed him to see how it all worked. And then he got a degree, and he opened his bike shop in the neighbourhood. He works, he has fun, and he hired an apprentice, yeah. So that makes me glad. We work together, it's cool.[168]

Val, owner and mechanic, Lyon

Notably, the blossoming of these forms of solidarity within the cycle repair ecosystem does not indicate that actors in this ecosystem never feel threatened. Indeed, some professional mechanics feel that other mechanics who adopt practices different from theirs are wrong or not treating customers as they should. Some of them also perceive the development of internet sales as a form of competition, and criticise customers who think that they can do without professional advice and purchase cycle components online, which may end up not fitting their cycles. Some of them also express worries about the rise of competitors:

I'll tell you about this other firm. They use a gig employment model, but instead of delivering food, they deliver a bike mechanic. Often they'll hire anyone, often people without a qualification. My concern is that the fees are huge for some repairs. And a couple of times I've worked on bikes after they worked on them. Once a woman called me for a puncture, the bike was weird – I thought, this wheel is set up in reverse! I asked her, "so you tried to repair it yourself?" And she said, "oh, no, I called that firm for this." I think that these guys don't do good work.[169]

---

[168] « Erwan à la base c'était quelqu'un qui bricolait déjà ses vélos, qui faisait un peu de montage de fixies et tout, et y'a une période où moi c'était compliqué, j'avais énormément de taf, j'ai demandé à Erwan de venir bosser avec moi. Il avait déjà ses bases, il a appris des trucs, j'ai appris des trucs avec lui, fin voilà, et ça lui a permis de voir comment ça fonctionnait. Et puis il a fait des études et il a ouvert son bouclard plus haut. Il bosse, il s'éclate, et il a pris un apprenti ouais. Du coup moi ça me fait plaisir quoi. On bosse ensemble, c'est cool. »

[169] « Je vais te parler un peu de [entreprise concurrente]. Les gens sont auto-entrepreneurs, mais au lieu de te livrer de la bouffe ils te livrent un mécanicien. Souvent ils prennent n'importe qui, généralement ce sont des mécaniciens non diplômés. Mais surtout, si tu veux, je trouve que les tarifs sont faramineux pour

Rémi, mechanic, Lyon

Actors and organisations involved in cycle repair and maintenance constitute an ecosystem, with complementary elements, which have different specialties, types of repair, and prices, and which sometimes cooperate with each other. This raises the issue of the velonomy afforded by different configurations of this ecosystem: namely, what would a velonomous ecosystem look like? The next subsections discuss two types of repair and maintenance spaces as they are embedded in consumer dynamics and the extent to which they contribute, or not, to cyclists becoming velonomous. We will first consider self-repair workshops.

3.b. The Velonomy of Self-repair Workshops

According to Zach Furness, one of the most efficient ways to develop alternative cycling practices is to organise them in specific spaces and institutions:

> While bicycle advocacy is not a social movement unto itself, the creation of participatory institutions is a vital way in which cyclists empower themselves, establish relationships across race/class boundaries, and foster an alternative cycling culture based upon DIY ethics. By and large, these institutions operate "outside of economic logic" and in marked contrast to the norms of capitalism: cooperation is emphasised over hierarchy, participation takes the place of consumption, and "garbage" is turned into useful goods through productive, rather than alienated, labour. (Furness 2010: 178)

One type of space embodies the approach of cycle repair as a way to not only save money and simplify the lives of cyclists, but also to promote environmental values: self-repair workshops. The aim of self-repair workshops is to provide cyclists with the resources and technical advice

---

certaines choses. Et surtout, je suis passé plusieurs fois derrière eux. Un jour une dame m'a appelé pour une crevaison, le vélo était bizarre, je me suis dit : "mais elle a été montée à l'envers cette roue !". J'ai demandé : "bah alors, on a voulu faire sa crevaison soi-même ?". Elle fait "Ah non, j'ai appelé [entreprise concurrente] pour ça". Les mecs je pense qu'ils ne bossent pas correctement. »

necessary to repair, maintain, or transform their cycle. As stated by Furness, these workshops often position themselves as "outside of economic logic". The next subsections discuss this positioning as it occurs in practice in self-repair workshops[170].

Self-repair Workshops and Activist Lifestyles

Alexandre Rigal researched French self-repair cycle workshops, where he observed strong support for anarchist, feminist, and open-source software movements, all of which commonly aim to oppose consumer society (Rigal 2019; 2022). In many of these workshops, repairing cycles is perceived as one of the many aspects of a wider lifestyle opposing consumerism. For instance, many self-repair workshops ask their members to subscribe to a set of values that go beyond repair. One of these workshops in Lyon, for example, has a list of values written directly on the wall under the sentence, "Joining this workshop means believing in, sharing, and getting involved in these values"[171] (Figure 4.14).

[170] As discussed in the first chapter of this thesis, some community workshops are self-repair workshops, which means that they are open to anyone wishing to repair their own cycle with the help of volunteers (often for an annual fee and subscription). This section focuses on self-repair workshops rather than on all community workshops, since they have the stated purpose of making repair accessible as part of their activity, while the spaces (being open to anyone who wishes to use them) are more easily comparable to commercial cycle shops. Self-repair workshops are more widespread in France, which is why most examples cited in this section are drawn from the Lyon fieldwork.
[171] "Adhérer à l'asso c'est croire, partager, s'impliquer pour des valeurs"

Figure 4.14 – Values of the community workshop are written on the wall

This identification, not only with a taste for repair, but also with a set of values and a whole lifestyle, is also experienced by many of the cyclists who frequently spend time in community workshops. Lucie, who was an employee at one of these community workshops for a few months, describes how encountering this community contributed to her changing her lifestyle:

> *At the workshop, it isn't just about repair – there is also a whole openness, a reflection on today's world, the ways that we have to consume, to live, well, there are so many things, actually. And I find that many of the people you meet there do not judge what you do or what you are, they just show you what they are and give you the option to get some insights from there… I don't know, Jeanne introduced me to the Bric à Brac, she said it's a thrift shop… and dumpster diving, it's also a new way to live and consume*

that is so valuable.[172]

Lucie, former community workshop employee, Lyon

This illustrates Isabelle Hajek's argument about the new forms that anti-waste activism is taking (2021). According to her, environmental activists have transformed spaces of consumption into political spaces, and this transformation has occurred through a transformation of their individual lifestyles – what she terms "an ecology of the self". Anti-waste activists engage in political actions through specific forms of consumption in their daily life, such as how they eat, dress, or communicate, in a way that goes far beyond cycle repair. Of course, this is not the case for all cycle workshop volunteers; however, community workshops are demonstrably spaces that facilitate the switch to more activist lifestyles. For instance, several members of the Chat Perché in Lyon are also involved with a bakery that delivers bread via cycle – connections were made so that community workshop members who wanted bread could order it directly from this bakery. This initiative competed with the practice of collecting bread leftovers from another bakery and distributing it to anyone who happened to be near the workshop space. Many people were thus introduced to the issue of food waste through a visit to the community workshop, even when the initial object of their visit was cycle repair. This existence of diverse activist initiatives with different objectives and approaches that interact with community workshops is evidence that these workshops are firmly anchored in a wider ecosystem of activist initiatives, aimed at raising awareness of diverse issues ranging from ethical food production and distribution to the open software and LGBTQ movements, that is increasingly local and horizontally structured (Frère and Jacquemain 2013).

Another discussion that takes place in some of the most activist community workshops concerns the fight against the idea of "innovation" as a value, as it is seen as detrimental to

[172] « À l'atelier y'a pas que de la réparation, t'as toute une ouverture aussi, une réflexion sur le monde d'aujourd'hui, nos manières de consommer, de vivre, enfin y'a plein de choses en fait, et je trouve que y'a des gens qu'on rencontre là qui ne sont pas dans le jugement de ce que tu fais ou ce que tu es, qui te montrent juste ce qu'ils sont et te laissent la possibilité de prendre en fait… je sais pas, Jeanne m'a fait découvrir le Bric à Brac, elle m'a dit voilà, c'est une forme d'Emmaüs… et puis la récup, c'est une nouvelle manière de vivre et de consommer qui est hyper riche. »

achieving realistic and efficient repairs. Because of this, a group of community workshops in Grenoble wrote a text entitled "We are not FabLabs" to define how their ideology differs from a growth-oriented, technology-oriented, and profit-oriented relationship to technical objects:

> Our use of technology is pragmatic and limited. It is not a value per se. We strive to adopt technological means that are affordable, open, easy to access, to appropriate, to repair, and to understand. We do not seek innovation but share knowledge that already exists.[173] ("Nous ne sommes pas des Fablabs", 2021)

However, this attachment to certain anti-consumerist values can also be debated within the community workshops themselves. In the following subsections, I expand on one of these debates, which highlights the paradoxical stance of community workshops towards a consumer society: the debate concerning the marking of cycles.

Cycle Marking and the Contrasting Reactions of Community Workshops

The debate around cycle marking was an important one for French community workshops. The law of mobility orientation (LOM) was enacted in 2020. This law aimed to transform the juridical framework around mobility by sharing responsibility among different local authorities for the management of public transport (Crépin et al. 2020), regulating the use of electric scooters in urban areas, and transforming the possibilities given to firms to contribute to the expenses of employees commuting by cycle or carpooling, among other factors.

One item contained in this law concerned the marking of cycles. Specifically, the law made it mandatory to mark all new cycles sold in stores. Following its implementation in January 2021, new cycles are required to carry a unique identification number to which the name of the owner will be attached[174]. This identification system existed prior to the passing of the law, but was not

---

[173] « Notre recours à la technologie est pragmatique et limité. Elle n'est pas une valeur en soi. Nous tâchons d'adopter des moyens technologiques pas chers, facilement appropriables, compréhensibles, autant que possible libres, réparables et faciles d'accès. Nous ne cherchons pas l'innovation, mais partageons des savoirs qui existent déjà. »

[174] Arrêté du 29 décembre 2020 relatif à l'identification des cycles (URL:

mandatory. Mandatory marking also applies to second-hand cycles, starting in July 2021. Accordingly, this law will affect the operations of community workshops, many of which sell second-hand cycles as a way to fund their activities.

Cycle marking was promoted by most actors in the cycling industry, as it was presented as a way to reduce cycle theft, which is one of the main issues faced by cyclists. Among other actors, the main cycling activist group, the Federation of Bicycle Users (Fédération des usagers de la bicyclette; FUB), has been lobbying for cycle marking to be made mandatory for a long time. Indeed, in 2004, FUB created their own marking operator, Bicycode[175], which has subsequently become very popular. Together with the Union of Sports and Cycles (USC), the national organisation representing the industries of sports and cycle manufacturing and distribution, the FUB created an institute for the promotion of cycle marking shortly before the law came into effect[176]. Together, the FUB and the USC are the two main French cycling organisations, and they represent both cyclists and cycle retailers, which increases their legitimacy in the opinion of national authorities.

Despite this national movement, the national network of community workshops, l'Heureux Cyclage (LHC), has opposed the law since it was first proposed. A board member of the organisation declared that this was actually one of the first occasions on which the network attempted to weigh in on national legislation:

> *For ten years, the network has worked on developing community workshops, and it has worked: there are over 300 workshops now, more in France than elsewhere. But now we have interests, issues, and we need to defend them. We used to say that we would defend the voices of workshops, represent them… Up until now, we were not doing that because we were busy elsewhere, but staying silent is not possible anymore. There is a national bicycle plan, institutions want us to take a position, the SNCF[177] got in contact*

---

https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000042838196?r=MP6T64Kfqi).

[175] Bicycode displays the support that they receive from the FUB on the main page of their website (https://www.bicycode.eu/, accessed July 2021)

[176] https://www.fub.fr/fub/actualites/lutte-contre-vol-recel-velos-fub-union-sport-cycle-creent-association

[177] SNCF is the national railway company in France

with us, many people want to organise things with us.[178]

Sarah, board member of LHC

LHC's main argument is that cycle marking makes the reusing of cycles very difficult. Most community workshops function with the aid of cycle donations, with some of these cycles being found in the street or in the yards of communal buildings. If community workshops are required to search national registers each time a cycle is donated to them, then call the previous owner and ask whether they are allowed to repair and sell it, this would vastly increase the time expenditure and costs for these organisations. According to this law, moreover, community workshops are required to store marked cycles for several months before re-purposing them, in case the previous owners have changed their minds and want their cycle back. However, these arguments were barely addressed in consultative meetings for this law, as LHC was the only organisation opposed to it:

> *At the consultative meeting, the cops were there, and one of them told us, "oh, so you're receivers of stolen property!". He made this joke three times, and I got a bit angry. As it happens, we're not receivers, and we're trying to tell you, "hey, we need to think of the bicycle's end of life, and if this law is passed in its current form, we actually won't be able to continue to exist".*[179]

Sarah, board member of LHC

Initially, the law attracted little attention. However, shortly after it was passed and before its

---

[178] « Pendant dix ans, le réseau a travaillé au développement des ateliers en France, et c'est réussi, ça a explosé complètement, plus en France qu'ailleurs d'ailleurs : il y a plus de 300 ateliers maintenant, mais aussi maintenant on a des intérêts, des problématiques, et il faut les défendre. Il y avait l'enjeu de dire qu'en tant que réseau on est là pour vous représenter, porter vos voix. Jusque-là on ne le faisait pas parce qu'on était branchés sur autre chose mais là c'est plus possible. Il y a un plan vélo, il y a des instances qui attendent qu'on se positionne, la SNCF nous contacte, plein de gens veulent faire des choses avec nous. »

[179] « Et à cette fameuse réunion là il y avait les flics, quelqu'un qui nous a dit "ah oui mais vous vous êtes des receleurs !". Il a fait la blague trois fois et je me suis un peu énervée. On est pas des receleurs justement et on essaie de vous dire "eh, il y a aussi la fin de vie du vélo et si la loi passe comme ça on va pas pouvoir continuer à exister en fait." »

implementation, many workshops began to exchange worried emails about how they would have to transform the way they functioned in order to accommodate the new regulations. Whether or not community workshops were supposed to mark the cycles they sold was unclear. A new movement discussing the advantages and issues of mandatory cycle marking arose, and special online meetings were held in order to arrive at an official position on this piece of legislation that LHC would express to French public authorities (who happened to be their main financial sponsor).

In the end, the network chose to oppose to the law in its existing form – a rather symbolic positional choice, but one that could still be detrimental to the financial support LHC received from national authorities. Meanwhile, some member workshops launched an organisation opposed to mandatory cycle marking, arguing that it would not only increase costs and workloads for workshops, but that it was also an issue of privacy and control for cyclists, as the law removed the anonymity previously afforded to them. The law also increases costs for cyclists, who are required to pay the additional marking and registration fees; in addition, the emphasis on control – which may prevent marginalised cyclists, such as undocumented people, from purchasing a cycle even second-hand – was framed by this organisation as a human rights violation.

> Many of us, both daily and occasional cyclists, care deeply about the respect of our public freedoms and of our privacy. The cycle is a useful object; we also see in it an object able to lead us collectively towards an ideal of emancipation that is barely compatible with a society of generalised control. In this regard, the decision to keep records of the identity of cycle purchasers, starting on January 1st, 2021, is unacceptable.[180] (Manifesto of the anti-marking collective, March 18 2021)

[180] « Nous sommes nombreu·x·ses, cyclistes du quotidien ou occasionel·le·s, à être attaché·e·s au respect de nos libertés publiques et de notre vie privée. Au delà de l'utilité du vélo, nous y voyons un objet capable de nous porter collectivement vers un idéal d'émancipation peu compatible avec une société du contrôle généralisé. A cet égard, le fichage obligatoire des cyclistes lors d'une vente de vélo entré en vigueur le 1er janvier 2021 est inacceptable. »

This anti-marking movement shows how the fight against consumerism can take many forms and extend beyond cycle repair, but may also involve the juridical sphere as well as other forms of human rights issues, such as the right to data privacy and the inclusion of people in precarious situations into cycling culture. Despite this, many community workshops have embraced the law while adapting to its implementation, by sharing advice on how to mark cycles in a convenient and affordable way:

> *Here is an analysis of the profitability thresholds of marking using two different techniques, engraving or adhesive labels, and based on sales prices and marking volumes, that I made for the monthly meeting of our community workshop. It is based on the latest known prices of the cycle-marking firm Bicycode.*[181]

Email sent to LHC members, February 5 2021

The example of cycle marking highlights the paradoxical position occupied by community workshops as they oppose consumerism and advocate for cycle re-use. Their marginal political power did not allow them to oppose the vote on the cycle marking law. Faced with this failure, some of them built spaces of discussion and opposition to this law, while others adapted to it by trying to find ways to benefit from it. While community workshops are not spaces of uniform opposition to consumer society, they do provide cyclists who wish to engage in such criticism with some resources.

Having described the extent to which self-repair workshops promote an anti-consumerist approach to varying degrees, I now focus on the ways in which these spaces can encourage the development of velonomy by transforming the cycle–cyclist relationship.

---

[181] « Je vous joins une analyse des seuils de rentabilité économique des choix Etiquettes/Gravage selon les prix de vente et volumes de marquages que j'ai faite pour notre CA. Elle est fondée sur les derniers prix connus de l'opérateur Bicycode. »

Becoming Velonomous thanks to Self-repair Workshops[182]

Previous subsections have described the position of self-repair workshops within the repair ecosystem. However, to understand the ways in which these workshops contribute to velonomy, it is important to understand the ways that cyclists appropriate these spaces dedicated to learning and conviviality (Bradley 2016).

In the Lyon metropolitan area, most cyclists are aware of the existence of community workshops: 48% of them have already attended one, and 31% visit them occasionally or often, whereas this is only the case for 12% of Melbourne cyclists. As a result, cyclists who have never attended a self-repair workshop still consider them as places where they could one day go and learn how to repair a cycle:

> *I would maybe put more trust in a cyclist whom I considered to be a seasoned mechanic and who would tell me, "do it like this, like that". That's why I think the type of organisations where you typically learn how to repair would suit me better than doing it on my own at my place. Thus far I have not had any opportunity to do this, but…*[183]
>
> Aline, cyclist, Lyon

A typical experience of visiting a community workshop as an inexperienced mechanic is related by Marlène. She was guided through all the repairs that her cycle had needed for a very long time, from the diagnosis to the end of the repair, spending whole days in the community workshop with the help of volunteers. She went through a slow process of trial and error, during which she was encouraged to make her own mistakes so that she could improve:

> *Often I think it'll take an hour, but I end up spending the day at the workshop [laughs],*

---

[182] Some of this subsection was used in the paper "Devenir cycliste, s'engager en cycliste" (Abord de Chatillon and Eskenazi 2022)

[183] « J'aurais peut-être plus confiance dans un cycliste que je considère comme chevronné et qui me dirait "fais comme ci, fais comme ça", c'est pour ça que typiquement le genre d'associations qui aident à réparer, je pense me correspondrait plus qu'un truc tout seul chez moi. Pour l'instant j'ai pas encore eu besoin de le faire mais… »

because there is an issue, but then you discover another one, and so on. And I still need things to be explained to me a lot. And so when I go there, I don't only go there with the idea of finding some tools, but also to have someone explain to me what to do. Because I don't understand where the issue comes from… Last time they said, "but look, your brakes are completely worn, you need to replace them". Luckily you can buy parts on the spot and do everything at once.[184]

Marlène, cyclist, Lyon

Florent, another Lyon cyclist, is more experienced with repair than Marlène. However, he still uses self-repair workshops, as they are places where he can access tools and technical advice when he is not very comfortable with a given repair operation:

We just tightened it. I didn't know if it'd be enough, I just tightened it. At first I thought we had to replace it, that it couldn't work anymore, for other reasons as well, but he said "no, no, don't worry, you can take it apart, clean it, tighten it again, and it'll do." Now I always ask for advice at the workshop before doing anything.[185]

Florent, cyclist, Lyon

Some other cyclists choose to volunteer at the workshop, which is another way to learn repair very quickly, as well as to contribute to an organisation that they appreciate. Jeanne recounts her experience as follows:

At first I volunteered two or three times per week. I learnt a massive amount of things

---

[184] « Souvent je pense que j'y passe une heure et en fait j'y passe une journée [rit], parce qu'il y a un problème mais tu te rends compte d'un autre, et tout ça. Et moi j'ai encore beaucoup besoin qu'on m'explique. Et du coup quand j'y vais, j'y vais pas seulement avec l'idée de trouver les outils, mais qu'on m'explique ce que je dois faire. Parce que je comprends pas d'où vient le problème… La dernière fois ils m'ont dit "mais regarde ils sont complètement bouffés tes freins, faut les changer". Heureusement tu peux acheter des pièces sur place et tout faire d'un coup. »

[185] « On a juste resserré. Moi je sais pas si ça va être suffisant. J'ai juste resserré. Au début je pensais qu'il fallait le changer, que ça allait plus, pour d'autres raisons aussi, mais il m'a dit "non non t'inquiète, tu peux démonter, laver, reserrer et ça ira.". Maintenant je prends conseil à l'atelier avant de faire quoi que ce soit. »

in a rather short time, actually, because when you spend this long at the workshop, you see so many different things… that's it.[186]

Jeanne, community workshop volunteer, Lyon

While Noël did not experience any radical moment of transition, he identifies a progressive improvement in his repair skills, for instance as far as gear adjustment is concerned:

I had already done some derailleur adjustment, but it was rarely satisfying. At the workshop, I actually learned how to do that in a tidy way, by aligning the stop screws properly, by aligning the whole thing. And it is true that once the derailleur is set, well, it can't move.[187]

Noël, cyclist, Lyon

Certain resources (parts, tools) are made available to all workshop members, while some community members who are more involved in the workshop than others are sometimes allowed to access some better-quality parts for their own repairs. Over time, workshop members become increasingly velonomous and often acquire their own tools in order to perform repairs at home rather than at the workshop:

So at the workshop, I learned a lot, and then, once you know and the bikes are repaired, it becomes easier… And meanwhile, I acquired some equipment, I've got a chain whip to take cassettes out, etc. So I don't need to go in to the workshop as frequently.[188]

Noël, cyclist, Lyon

---

[186] « Au début je faisais deux ou trois permanences par semaine. J'ai appris énormément de trucs en pas très longtemps en fait parce que quand tu fais autant d'atelier tu vois tellement de trucs différents que… voilà. »

[187] « Le réglage de dérailleur, j'avais déjà fait ça mais c'était rarement satisfaisant. Effectivement à l'atelier j'ai appris à faire ça à peu près proprement, en mettant les vis de butée correctement, en alignant tout le truc et effectivement, une fois qu'il est réglé le dérailleur, il bouge plus quoi. »

[188] « Donc à l'atelier j'ai bien appris et puis après, une fois qu'on a appris et que les vélos sont réparés ça devient… en plus entre temps je me suis équipé, j'ai un fouet pour démonter des cassettes etc., donc moins besoin d'aller à l'atelier. »

Some of these more experienced workshop members continue to attend to the workshop, contributing as volunteers or as board members. Others simply use their cycle workshop membership as a handy resource; membership can be useful on the rare occasions when they need to perform a repair that they are less familiar with (and may therefore benefit from expert advice), or when they need some rare tools that they do not have at home:

> *I don't come in very often. That time it was to rethread my cranks, so that I could fit my pedals back on. But often [when I go in] it is to use a tool that I do not have. For instance, I don't have many tools for the bottom bracket… but I do all of the general maintenance in my home.*[189]
>
> Florent, cyclist, Lyon

This depiction of the experience of diverse cyclists in Lyon illustrates the traditional trajectory that they follow: they first learn how to identify issues and repair the most basic ones, then continue to attend to receive advice even once they know how to perform certain repairs. They learn repair while dealing with the breakdowns of their own cycle and sometimes acquire their own tools. In the end, most cyclists visit the community workshop less and less frequently; the exceptions tend to be cyclists who have appreciated the atmosphere of these spaces in the course of their visits and decide to return there as volunteers, a position that will allow them to learn more and, in turn, advise workshop members.

Despite this clear goal of enabling cyclists to appropriate their cycles, community workshops are not entirely separate from consumer society and the market. This is reflected in the way they are managed: even in these workshops, cycles of lesser quality are recycled or even refused, whereas cycles of higher quality will be restored for sale or donation. One community workshop volunteer described the worries caused by receiving an extremely expensive cycle

---

[189] « Je viens pas très souvent. Là c'était pour tarauder des pas de vis. Pour pouvoir remettre mes pédales. Mais souvent c'est pour utiliser un outil que j'ai pas. Les outils pour le pédalier par exemple, j'en ai pas beaucoup… mais tout l'entretien courant je le fais chez moi. »

as a donation for the workshop:

> *What we do, because we've actually had problems with having those types of bikes in the workshop, we try to keep them out of sight in the shed and get the volunteers to take them. We used to always just put them on display and sell them like everything else, but then we started getting the reputation of having these beautiful bikes you could buy very cheaply. And then we started getting people turning up because their mates had bought a bike that should have been $1500 or $2000 that they bought for $100, and they turn up and go, "my mate bought a bike that's so much better. Where are you hiding it?". And we actually had people starting to get angry with us. [...] It happened several times. And then we decided that whenever a good bike comes in, we should make sure that as few people see it as possible.*
>
> Walter, community workshop volunteer, Melbourne

The ideal of a space that can accept any type of cycle and turn what others might call waste into a valuable resource should also be questioned. Even community workshops sometimes lack space and have to throw parts away. At one workshop, I was once asked to carry out a task that entailed examining the rims of cycle wheels for minor damage and then throwing the damaged wheels (if any were found) into the metal waste bin. Several of these wheels seemed repairable to me; however, the workshop employee explained to me that these were wheel sizes that we had plenty of, meaning that we could afford to be picky with them. For rarer wheel sizes, it would be useful to keep slightly damaged wheels.

Another reason why the conviviality of these workshops could be called into question relates to the issues encountered by people belonging to certain minority groups (related to gender, skin colour, ethnicity, etc.) when visiting the workshop. Gender discrimination within cycle repair and maintenance spaces, including in community workshops, is discussed in the next (and last) chapter of this thesis. However, this is not the only type of discrimination to occur regularly in community workshops; foreigners, for example, may also encounter specific issues (Arnold 2012).

3.c. Cycle Shops and the Struggle for Velonomy

While self-repair workshops often situate themselves as spaces of alternative consumption, which are organised in ways that attempt to contribute to velonomy, this is often not the case for cycle shops, which function based on objectives of profitability and fully inscribe their activity in a commercial setting. Despite this, they are also an essential element of the repair ecosystem, and thus play a strong role in the cycle–cyclist relationship. This subsection discusses the position of cycle shops in a consumer society and the way it enables or restricts the velonomy of cyclists visiting these spaces.

The Balance Between Sales and Repair

An essential aspect of the inscription of cycle shops in a consumer society is the balance between the activities of sales and repair. Most shops perform both activities. Indeed, cycles must be assembled before sale, a process that requires tools, a workshop and a qualified mechanic; since these things are then present in the shop, it makes sense to also perform repairs. Another reason why many shops both sell and repair cycles is that a sale of a new cycle often necessitates a subsequent mechanical follow-up: many cycle shops include a free service when they sell a new cycle, which allows them to perform some of the adjustments that are often necessary after a few months of riding. The workshop can also bring in some sales business, since customers who come in for repairs may notice a cycle or a piece of equipment that they would like to purchase.

Despite this obvious link between repair and sales, the two activities also have contradictory aspects that complicate their co-existence. For example, one shop owner stated that he had initially refused to sell cycles, as he thought that it would conflict with his ethics as a mechanic:

> *I'd thought that a standalone bicycle repair business was a good idea, without having bikes to sell and assemble and complicate your values when you're assessing a bike. You're both wondering if it's worth repairing or not and thinking "can I sell this person a bike?", which is the way bicycle shops have to function when they've got bikes to sell. We don't do that, so if I have to say to someone, "well, I don't think that's worth*

repairing", I know that I will not make any money out of it, because they're going to take it away.

Phil, owner and mechanic, Melbourne

For Phil, selling and repairing cycles are contradictory actions. This moral position is all the more difficult in light of the fact that sales make up most of a cycle shop's turnover: repair represents only 23% of a cycle shop's turnover on average, both in Australia (Bourke 2016) and in France, as observed in Paris (6T 2018). Moreover, in cycle shops, which often have only one or two employees, it is very common for the same person to perform both sales- and repair-related tasks.

Due to the very different nature of repair and sales, it is often the case that shops will focus primarily on only one of the two activities. Many cycle shop employees or owners described repair as something that they need to do, but which does not bring any value to the activity overall. On the other hand, some mechanics sometimes feel very uneasy regarding sale operations:

People have approached me to sell bikes. But because they're cheap, people have problems and come back to me, and because I've sold it to them, I feel obliged to fix it. If people go and buy cheap somewhere else, they come to me with the expectation that they're gonna have to spend some money, but if I sold it to them, it's different. Selling bikes is very different to repairs. With repair, people come in, "my bike is broken, can you fix it?" "Yeah." "How much?... Okay". I can't remember anyone who's ridden off and said, "nah, I don't wanna do that". Most of my effort is on actually doing the work.

Dave, mechanic and owner, Melbourne

The gap between repairs and sales is an issue not only for shops, but also for community workshops. These workshops often struggle to balance these two activities, since repair is often their primary activity, but sales keep them afloat.

Although many cycle shops consider repair to be the less profitable aspect of their operations, others have found ways to make it profitable, as one Melbourne shop owner explained:

> *We've got some set service plans, cost-wise, right, but on top of that, when you take your car in for a service, it's sometimes not just the labour, it's the parts, the tyres, all of this, right? And that can take a job from $100 to $200 or more. And then, therefore, that makes this job become more profitable. Because you're spending the same amount of time, right, you're getting a higher dollar figure, right, and the bike is actually leaving much better than when it came in. [...] I try to see bicycle repair similarly to bicycle sales: what people want is not for a thing to be fixed, it's for it to really work well, and not everyone, but some of them, would be ready to spend lots of money if they know the end product will be good. Everyone's got a different idea on how to do things. But we like bikes to certainly go out better than when they come in. And the unfortunate truth is that it is, or can be, expensive.*
>
> Grant, mechanic and shop owner, Melbourne

According to Grant, a good repair – just like a good cycle – should include high-quality and thus expensive components, which is why he finds repair profitable. In this case, the profit does not come from the repair itself, but from the sale of the parts and components that are fitted during the repair. However, the viability of this strategy is being called into question by the availability of cycle parts online, which reduced the ability of cycle shops to earn from these sales:

> *My shop, they used to say it was like a jewellery store, like Aladdin's cave, you know, beautiful things – but now, no one buys [those things] in a shop. The overhead of things per sale is too high to compete with Internet sales. So what's left in this industry is the repair, because you can't get your bike serviced on the Internet, that's what I thought.*
>
> Paul, mechanic and shop owner, Melbourne

The difficult balance between sales and repairs illustrates the delicate position of repair and

maintenance spaces within a consumer society. While sales of cycles or parts are often the main source of income for cycle shops, repair has a more marginal status: it oscillates between a fundamentally anti-consumerist activity, one that is necessary but not financially profitable, and one that can be organised in a way that can attract further income.

Feeling Unwelcome in a Cycle Shop

In Tools for Conviviality, Illich warns his readers against allowing the development of a professional elite who is in charge of the tools (Illich [1973] 1975). He argues that professionals mediate the relationship that people maintain with their tools, and thus reduce the control they have over these tools. The position of cycle mechanics as intermediaries between cyclists and cycles is thus worthy of investigation.

It is true that some cyclists experience cycle shops as gatekeepers of repair knowledge and potential swindlers. This is the case for Taylor, a Melbourne cyclist who is rather well-off and can easily afford professional repair, but who has had so many bad experiences with cycle mechanics that he ultimately decided to learn everything on his own:

> *You go to the bike shop, and you have a good experience with the mechanic, and then the next time, it's a different mechanic and they do a bad job. And then, I go to another bike store and the same thing happens. And after I got through three or four bike stores, you get to the point [where you say], I'll buy the tool and do it myself once. And so now… I just do it.*
>
> Taylor, cyclist, Melbourne

When professional mechanics are the sole masters of repair knowledge and the only ones capable of repairing cycles, cyclists become dependent on them for their appropriation of their own cycle. A bad professional repair can be experienced as a trap for cyclists who are in this position of dependency, and feelings of mistrust may develop; several cyclists relayed stories of feeling they had been given a repair bill that did not accurately reflect the work done on the

cycle. The asymmetry between cyclist and mechanic reflects the one that can be found in the second-hand car market, and that informed the economic theory of asymmetrical information (Akerlof 1978).

Other, less experienced cyclists also felt disempowered when confronted by the authority of professional mechanics and left feeling uncomfortable after interactions with them. One Melbourne mechanic explained the situation as follows:

> *But other bike stores, we have a lot of people talking about – and even in our experience, there is this level of condescension in them, and they have a really bad reputation for customer service, especially for women. Because there's this kind of culture in bike culture, I'm not sure if you've heard of it, among people who are into bikes, especially for people who work at bike stores, and they kind of lord it over you… like, kind of, "oh, you don't know what you're talking about, it's kind of embarrassing that you even asked", you know, they'll say that. So when people come to get their bikes fixed and they don't know what's going on, "I think there's something wrong with it", and the person will almost scoff at them and talk down to them and stuff. And I'd say that's a nightmare for people to get an experience like that in a bike shop.*
>
> Michael, mechanic and shop owner, Melbourne

Several cyclists mentioned feeling uncomfortable after a visit to the cycle shop, and indeed, this was most often the case for women. For instance, Mary felt stressed out after visiting a specific cycle shop:

> *Some shops make you feel stupid if you don't wanna ride a road bike, which I don't. It feels that they're really only there for, you know, for the dudes that wear lycra. And you know, I wear lycra when I ride for long rides, but I kind of feel that I wasn't really their key market. I just want to ride a bicycle. It's just a bit different from what they're all about.*
>
> Mary, cyclist, Melbourne

Another example of this construction of cycle mechanics as a profession is the Facebook group "The funny side of bike mechanics". In this group, mechanics often make fun of ignorant customers, such as one type of client encountered so frequently that it has become a meme: the "engineer" who thinks he knows how to repair a cycle better than the actual mechanic would, but simultaneously demonstrates his ignorance in diverse ways. Cyclists who have attempted a repair themselves in ways that worsened the condition of their cycle are also described and commented upon in demeaning ways.

Cycle shops can thus be spaces where cycle repair is perceived as a competence that is not accessible to all, requiring specific qualifications and a certain status before one can be authorised to engage with it. However, they can also be spaces where people can acquire resources and become velonomous.

Cycle Shops and the Development of the Cycle as a Convivial Tool

Chapter II of this thesis described some attempts by professional mechanics to make cyclists aware of the degradation of their cycle, and help them engage with repair in a more progressive way. These attempts contribute to the development of a shift towards a maintenance-based attitude to repair, and accordingly to a higher velonomy.

Some mechanics have even begun to teach customers maintenance classes in an attempt to help cyclists gain a better understanding of their cycles. This is for instance something that was considered by Paul, owner and mechanic in a shop in Melbourne. Working as a mechanic led him to understand that many of his customers lack basic mechanical knowledge:

> *You know, I considered to give classes, but… I'm so busy, you know. But the people, they only need to know the most basic things. They don't need to know how to service the electronic gear shifting, they just need to know how to do up the quick release, change the seat, and understand when the brakes are not working, when they're bad… they don't even know. They think it's okay, but they don't know. And then they ride the*

bike until it won't stop anymore, or until you can't pedal… It won't go, that's when they bring it.

Paul, owner and mechanic, Melbourne

Some other professional mechanics consider it part of their role and responsibility towards their customers to explain to them exactly what they are doing, and to help them understand the exact goal of the repair. This is considered both ethical business practice and a smart business move among mechanics who do not earn much from the most basic repair operations. Eric, who works at a firm that conducts mobile repair in several French cities, including Lyon, relayed the follows:

> *We ask mechanics to keep the door open as much as they can, so that the customer stays during the repair, so that they can see what is happening. We also ask them to not see their skills as a private thing. […] If the customer ends up repairing their own puncture, at least their bike will work, and they will probably call you later for something more serious, an actual service or… Because repairing punctures is fun, but not very profitable. We'd rather do some general services or more complex repairs.*[190]

Eric, mechanic and manager, Lyon

Other cycle shops are committed even more strongly to velonomy. For instance, one Melbourne shop has implemented processes for transparent communication with the customer, a principle that is embedded in the pricing principles, the welcoming methods, and even the shop setup: the repair area is at the centre of the shop instead of at the back (as in most cycle shops), so that the customer is able to see the repairs being performed:

---

[190] « Par contre on demande aux mécaniciens de laisser au maximum la porte ouverte pour que le client reste pendant la réparation, pour qu'il voie ce qui se passe. On leur demande aussi de ne pas voir leurs compétences comme un pré gardé. […] Si le client répare sa crevaison, au moins son vélo va rouler et puis il t'appellera peut-être pour un truc plus lourd, une vraie révision ou… parce que réparer les crevaisons c'est chouette mais pas très rentable. Il vaut mieux faire des révisions ou des opérations un peu plus complexes. »

When someone comes in, the assessment is done with the customer. So we put the bike up in the stand, introduce ourselves, we can show, and that might start a conversation, "oh, how did you do that?", "well, we adjust the spokes", you know. So rather than coming and saying, "I want a gold service", and the bike gets wheeled out the back, it involves our customers, if they want to be. Ninety-nine times out of a hundred, the assessment is done with the customer present there, and you're talking them through it – so they're either learning, or at the very least they're made aware of what you're doing and why. And then when they pick it up, there are notes. We can say if there is anything remarkable, or parts that've been replaced, or notes for the next service, to keep an eye out for this, or this needs to happen down the track. There is a discussion, often involving the mechanic who's worked on it. So because of the way we check bikes in and out, every service is certainly an opportunity for someone to learn a little bit about their bike and how it works.

Rhys, owner and mechanic, Melbourne

This example illustrates that cycle shops can also be spaces in which cyclists are introduced to some of the mechanical aspects of their cycle, along with basic principles of repair. The shop can be a place of education about basic repair and maintenance operations.

It also frequently occurs that cycle shops give simple advice to cyclists in need; for instance, those who are attempting a repair for the first time and only need a very specific tool, or feedback on whether what they are doing is right.

Some shops even let customers in good standing borrow certain tools:

And so I needed to rethread the thread, that's what I still needed to do, and I went to a shop. So… the tool is expensive, and it's not worth buying it when you're a private individual. Since I'm on good terms with the people who own the shop, they lent it to

me, and I did the repair in the back of the shop.[191]

Florian, cyclist, Lyon

Overall, cycle shops can represent important social spaces in the neighbourhood, as well as gathering spaces for neighbours. The fieldwork conducted in Lyon and Melbourne included hours spent in spaces of repair, where I could observe many instances of activities and interactions that went far beyond the standard economic transactions implied by the concept of cycle purchase and repairs. People come and go, the phone rings, friends of the mechanics pass by, customers and shop employees joke with each other… One example of such an interaction, which occurred during an interview with Val, a Lyon mechanic and small shop owner, is provided below.

V – You need to order a bottom bracket. The issue is that I'm closing the shop until the end of August… but I will still be around next week, low-key at the shop. I'll do some renovations, that sort of shit… So if you receive the bottom bracket, you bring it to me, I'll fit it for you. If you message me on my Facebook page I'll tell you what day we can see each other. Ok. You're leaving Bernard here?

S – Yeah, in any case…

V – Yes, you're not going to ride it I guess.

G – Hey, Val, bye! You'll tell me if you need any help for the holidays?

V – Sure! I wanna make a big piece of furniture there, along the wall – I'll tell you later. What are you doing, you're going on holiday? [to S] Okay, leave it to me, keep me posted when the order shows up!

S – Do you think we could order it now with my card? Like we did last time? That way

[191] « Et du coup pour passer un coup de taraud à l'intérieur, ça c'est ce qui manquait, et du coup j'étais allé voir un magasin. Du coup… l'outil est cher et vaut clairement pas le coup d'être acheté par un particulier… vu que j'ai des bonnes relations avec les personnes qui tiennent un magasin ils me l'avaient prêté, je l'avais fait derrière. »

we can be sure that it'll arrive okay!

V [shouts at the waitress at the bar across the road] – Camille, an apple juice! [To me] I'm awful with her. And yet I love her!

C – [from across the road] Dream on![192]

This example provides a glimpse of the central role played by some cycle shops in their neighbourhoods: in short, they can be social spaces of encounter. In this case, the mechanic goes way beyond the requirements of the commercial transaction. He keeps the cycles of some customers in his store (a not-so-common practice; shops usually try to keep the the number of cycles they have in storage to a minimum), does some repairs for customers even when the shop is closed to the public, jokes with neighbours in the street, and so on. In the course of this fieldwork, I had the chance to observe many cases of this phenomenon of the cycle shop acting as a social space of gathering, where customers are sometimes treated as friends, invite mechanics to the restaurant, and sometimes even give them a hand with some repairs.

Some shops also foster this convivial atmosphere by hosting a range of activities. Some host weekend or afternoon rides, while others decided to host events such as screenings of documentaries about cycling. The trend of bike cafés is growing, and one Melbourne shop is also partly a coffee shop (Figure 4.15), as its owner explains:

And the reason I've got coffee is that when I first started this business in this area, there was no good coffee, and I knew I could do it better myself – so I just got coffee [laughs]

---

[192] « V – Bon il faut que tu commandes un autre pédalier. /S - Ouais. Okay. /V - Le problème c'est que moi je ferme jusqu'à fin août… Mais je suis encore là la semaine pro, en sous-marin au magasin. Je vais faire des travaux, des conneries… donc si toi tu reçois le pédalier tu me l'amènes je te le monte. Donc tu me dis que tu as reçu le pédalier moi je te dis quel jour on peut se voir sur ma page Facebook. Ok. Tu veux laisser Bernard ici ou… ? /S - Bah de toute façon oui… /V - Oui tu vas pas rouler hein. /G - Val je te dis à bientôt ? Tu me dis si t'as besoin d'aide pour les vacances ? /V - Ok ! Je veux faire un grand meuble là tout le long, je vous dirai. Tu fais quoi tu pars en vacances ? (à S) Allez laisse-le moi, tu me tiens au jus quand il arrive ! /S - Est-ce qu'il y a moyen de le commander maintenant avec ma carte ? Comme on avait fait la dernière fois ? Comme ça on est sûr qu'il arrive !
/V (à moi) - Je suis horrible avec elle. Et pourtant je l'adore ! [crie à la serveuse du bar d'en face qui passe dans la rue] Camille, grenadine ! /F [au loin] - Ouais c'est ça ouais ! »

and now there is… coffee!

Sasha, mechanic and owner of Pony Bikes

Sasha considers that providing the neighbourhood with coffee contributes to building a connection between the shop and road cyclists, who can stop by after a ride in the area.

Figure 4.15 – The owner of Pony Bikes preparing coffee in front of a sign reading "Flat whites not flat tyres".

Cycle shops thus have a role to play in velonomy in an urban setting. The way a shop is owned and managed can contribute to engaging cyclists with the mechanical condition of their cycle, giving them resources to repair and modify their cycles, reducing the gap between professional and amateur mechanics, or providing a warm atmosphere that encourages spending time in repair spaces and learning about one's cycle.

This section has discussed the ecosystem of repair and the involvement of actors in repair with the consumer dynamics of a consumer society. It has discussed the different ways in which cyclists, owners and employees of cycle shops, and members of community workshops engage with widespread imperatives of profitability. It also focused on these actors of repair as they constitute an ecosystem of repair in which the different elements, taken separately or together, transform velonomy by enabling different cyclists to appropriate their cycles. Community workshops constitute spaces where consumerism is questioned in many ways, and where velonomy is a central objective, although these alternative approaches are not always successful and are realised in heterogeneous ways.

Cycle shops are strongly embedded in the consumer society, and usually develop their activity in ways that they find profitable, an approach that is not always aligned with a strong focus on repair or an engagement with velonomy. The profession of cycle mechanics can create an artificial barrier to engaging with one's cycle and make repair appear to be a specialist task only accessible to a few. However, cycle shops can also contribute to the development of velonomy by developing transparency regarding the operations they perform and fostering interactions between actors in the repair ecosystem.

Conclusion

Cycling practices occur within a consumer society in which cycles are commodities: goods that can be purchased and sold, which come into and out of fashion, and which are generally subject to planned obsolescence. This context has significant implications for both the velonomy of cyclists and practices of repair.

In order to understand these transformations, this chapter has explored some aspects of repair as a commercial transaction. Specifically, I highlighted the different ways in which cyclists and mechanics experience this commercial transaction and negotiate between the value they ascribe to their cycle and the value that the market assigns to it. Repair is alternatively a space infused with consumer dynamics, a space that reinforces these dynamics, and a space in which these dynamics can be questioned.

In a society where repair and cycling are commodities, income is a strong determinant of repair practices: high- and low-income cyclists have different relationships to, and representations of, repair. I demonstrate that poorer cyclists tend to own more tools, are more likely to repair their own cycles and to be comfortable with performing some repair operations, and are more frequent visitors to community workshops and less frequent visitors to cycle shops. Moreover, they are more likely to use second-hand cycles and parts, as well as to purchase low-price cycles, which are generally more likely to break down and harder to repair. They have a different perception of professional repair and its costs. However, the experiences of cyclists in Lyon and Melbourne also differ in several key ways. Velonomy can thus be understood as fluctuating according to income levels, repair skills, and city of residence.

The conviviality of a certain urban environment is related to the structure of its repair ecosystem. This chapter defined such an ecosystem and explored its characteristics. It then focused on two elements of this ecosystem: self-repair workshops and cycle shops. Each of these spaces is embedded in the consumer society in different ways: self-repair workshops present themselves as alternatives to the mainstream economic system, whereas cycle shops acknowledge and contribute to market dynamics and prices. Despite these differences, both categories of spaces contribute to velonomy: they enable cyclists to engage with their cycles, provide them with

certain resources, and, in some cases, foster an environment that encourages cycling and repair.

This chapter provides an overview of the way in which cyclists, impacted as they are by different market dynamics and trends, make decisions regarding repair and maintenance. Overall, the consumer society is detrimental to velonomy, since it induces inequalities between cyclists regarding their ability to repair and learn; some of the poorest cyclists might delay a repair for months or even years due to their inability to afford professional repair, or because they are worried that such repair will be expensive. However, some spaces in the repair ecosystem, both among cycle shops and community workshops, contribute to the development of a culture of velonomy that reduces these inequalities. Self-repair workshops are a key resource for cyclists, while cycle shops sometimes function in a way that is welcoming and supports the velonomy of their customers. A velonomous society thus fosters a rich ecosystem of repair that includes low-price repair options, inclusive repair spaces with transparent practices, quality control, and information about low-price cycles. It should also enable questioning the consumerist practices that are widespread within the cycle industry, along with the impacts of such practices on marginalised groups such as lower-income cyclists.

Chapter V: Gendered Velonomies

"Are you a girly-man, riding a "unisex" bicycle saddle, or are you ready for a Real MAN ® Saddle?

Most bikes sold today come with so-called "unisex" saddles. A sizable minority come with saddles specially designed for women, but where is the saddle for the Real MAN ®?

If you look at advertisements for conventional saddles you'll see adjectives like "soft" "cushy" "comfy" "padded"...no wonder this country is going down the tubes, if that's the priority of the sybaritic masses. Can total decadence and degradation be far behind? The Real MAN ® saddle offers a rugged, spartan alternative that can help restore the hardy pioneer spirit that made this great nation what it was in its prime.

Can a bicycle saddle change the world? Why not! You've gotta start somewhere, why not at the bottom?"

Sheldon Brown, "Real MAN saddles", April 1st 2000

Cycling is a male-dominated activity in many Western countries, including France and Australia (Pucher and Buehler 2008). While the previous chapter contributed to existing research on mobility justice (Sheller 2018) and explored income-related inequality in velonomies as reinforced by consumer societies, this chapter focuses on gender-related inequality in velonomies as made possible by a patriarchal society.

The concept of velonomy considers cycling and cycle repair as interrelated and

complementary. This chapter studies gendered velonomies, focusing on the relationship between cyclists and their cycle as mediated by gender dynamics.

Although transportation research is increasingly investigating the intersection between gender and mobility practices generally, and cycling more specifically (Heinen and Handy 2012; Aldred et al. 2016), thus far there has been little consideration of the gender issues embedded within the material aspects of cycling, repair, or the life cycle of cycles.

Furthermore, previous research has investigated the struggles encountered by women learning manual trades (Mosconi and Dahl-Lanotte 2003), and female professional cycle mechanics are no exception to this (Laker 2018). Despite this, no study has yet been conducted on how gender mediates cycle repair and maintenance practices. The appearance of programming aimed at women (and at women and transgender people) in community workshops is an indication of a growing awareness of the gender discrimination that may arise in cycle repair and maintenance spaces.

Based on several feminist theoretical fields, namely materialist feminism, feminist phenomenology, and an approach that considers gendered practices as scripts, I develop three different axes for the understanding of gendered velonomy. First, a study of gendered material practices within cycling shows that women engage in different cycling practices than men, and that this difference is anchored in a gendered material culture of cycling that reinforces gendered norms of women being caring (taking responsibility for childcare and groceries, being careful with their own safety and appearance) and men careless (with regular practices oriented towards sports, speed, and risk-taking). In the second section, I argue that the patriarchal background against which cycle repair and maintenance practices are performed limits women's involvement, and willingness to engage, in cycle repair. The concluding section of this chapter focuses on the different individual and collective ways in which women appropriate their cycle, thus transforming the script assigned to them by a patriarchal society.

The quantitative data collected in this thesis reveals a roughly equal balance between male and female respondents to the survey: women constitute 48% of all respondents in Melbourne and 42% in Lyon. Overall, this proportion of female respondents is aligned with the proportion of

women who participate in cycling in Lyon, and even constitutes an overrepresentation of female cyclists in Melbourne.

During fieldwork, I brought some attention to the participation of women in this study. For instance, in both cities, I shared the cycle repair survey on women's cycling groups on Facebook in addition to the other forms of distribution. Furthermore, women may have felt more engaged with this survey when I approached them in the street than would have been the case with a male researcher.

There were a total of 13 respondents who do not identify with either the male or the female gender, representing 2% of Melbourne respondents and 1% of Lyon respondents. Given the small sample and the heterogeneity of the identities and experiences represented among this category of respondents[193], along with the lack of studies regarding their mobility practices at the time of this research, the choice was made to remove these 13 respondents from the sample when researching gender issues. Although there are certainly important insights to be obtained through exploring the practices of people belonging to other parts of the gender spectrum, this data does not allow for such an exploration. Thus, the quantitative data presented in this chapter only compares the cycling and repair practices of men and women.

[193] The terms "non-binary" or "gender non-conforming" do not refer to a homogenous category, but are rather umbrella terms that encompass a wide range of gender identities (Richards et al. 2016). The methodological implications of this diversity are briefly discussed in the blog post « Méthodo- topo#2 - Qui sont les non-binaires ? (qui répondent aux enquêtes par questionnaire) » in Du béton et des plumes by Milan Bonté, URL: https://betonplumes.hypotheses.org/83

1. A Gendered Relationship with Cycling[194]

Velonomy is a characteristic of the cycle–cyclist relationship that develops in unequal ways across different socio-economic groups. In the previous chapter, I discussed the different degrees of access to velonomy for lower-income cyclists. This issue also exists for another cyclist minority: women. Indeed, both France and Australia are societies in which, although theoretically equal to men from a rights perspective, women encounter certain difficulties in the course of engaging in cycling and repair practices.

1.a. Gender Issues in Cycling

Velonomy is a material interaction between the cyclist and the cycle. If, following Miller (1987), we consider that objects are the first bricks of our thought and thus of the construction of our identity, the social relations in which we live and the domination occurring within these relations are also embedded into our relationship with the cycle. This is thus also the case for gendered identity and gendered relations of domination. Cycling and cycle repair practices are therefore transformed by the gendered materialities on which they rely.

Although Lyon and Melbourne are two cities where men ride more than women, the gender gap in cycling participation is larger in Melbourne. In Lyon, recent counts conducted by the Metropolitan authorities show that female cyclists make 41% of all cycling trips (Adam 2018). In Melbourne, however, men are twice as likely as women to report having ridden a cycle in the past week (with 16% of men and 8% of women answering in the affirmative; Munro 2019). This indicates that only a third of all cycling trips in the city are taken by women. Since Lyon also has a higher cycling modal share than Melbourne, this confirms the observation that higher cycling participation contributes to lower gender disparities in cycling (Pucher and Buehler 2008).

The cycle repair survey results indicate that fewer women than men engage in cycling overall, and that those women who do cycle are also less frequent riders. Indeed, female cyclists in both

[194] Some material used in this section was initially used for the writing of a collective paper published in 2022, together with Nathalie Ortar and David Sayagh (Abord de Chatillon, Ortar, and Sayagh 2021).

cities ride less often than male cyclists: they are more likely than men to ride once a week or less, and less likely to ride every day, especially in Melbourne, where the gender gap is larger than in Lyon (Figure 5.1).

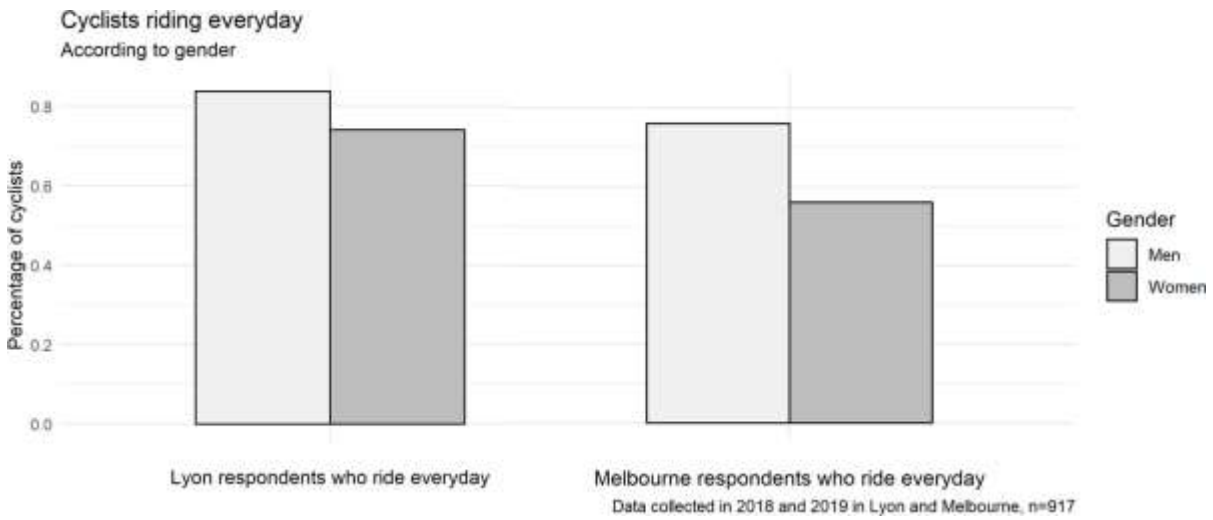


Figure 5.1 - Frequency of riding among Lyon and Melbourne cyclists according to gender

A fuller understanding of these gendered practices is enabled by applying two concepts drawn from feminist academic literature: "domestic mobility work" and "inhibited cycling practices".

Domestic Mobility Work

One stream of feminist theory that can potentially contribute to an understanding of gender issues in cycling is materialist feminism. This theoretical field has helped to conceptualise cycling as domestic mobility work.

Materialist feminism was developed in France during the second wave of feminist movements, shortly after the protests of May 1968. It is derived from Marxist theories of class and aims to understand the relationship between men and women as a relationship of political and symbolic domination, as well as economic exploitation (Koechlin 2019). Through an analysis of domestic work and childcare as reproductive labour, it is possible to analyse many activities that are primarily undertaken by women, and are unpaid or underpaid, as an appropriation of the value

of their labour by men (Delphy and Leonard 2019) that is crucial to the sustainability of capitalism (Federici 2019). Some feminist geography researchers – like the scholar Marie Gilow, who coined the term "domestic mobility work" (Gilow 2020) – draw from this same theoretical background in order to analyse gendered and class differences in everyday mobility.

The gender gap in cycling can thus be analysed through this lens of domestic mobility work: women's cycling practices are associated with the domestic space and reproductive labour (e.g. house chores and childcare). Women are not encouraged to engage in leisure and sport cycling, and common associations of speed, strength, adventure, and fun remain mostly linked with male cycling. These differences are encouraged by familial socialisation, since parents encourage their children to engage with sports activities that are more gendered than their cultural activities (Mennesson 2011).

Inhibited Cycling Practices

The second stream of feminist theory that conceptualises the relationship between material practices and gender is feminist phenomenology. This approach enables an understanding of women's material practices as inhibited by the patriarchal context in which they occur.

Feminist phenomenology presents a focus on the body and on embodied experiences that allows the specificity of women's conditions in a patriarchal society to be redefined. The philosopher Iris Marion Young argues that women move and behave differently to men not because of a mysterious feminine essence, but rather because of the material and social contexts in which they find themselves (Young 1980). Phenomenological theory bases human consciousness in the movement and perceptions of the body (Merleau-Ponty 1976). However, in a patriarchal environment, women's bodies are constantly facing social and cultural domination (Beauvoir 1986 [1949]). They are reminded of, and therefore internalise, the idea that they are other, inessential, mere objects, and immanent; that is to say, limited in their possibilities and actions. They are constantly reminded of the possibility of being looked at, touched, even harassed or raped:

> Woman is thereby both culturally and socially denied the subjectivity, autonomy, and

> creativity that are definitive of being human and that in patriarchal society are accorded the man. (Young 1980:31)

This hostile patriarchal environment also applies to cycling practices. Indeed, female cyclists in Lyon and Melbourne are both vocal regarding the specific gender issues in cycling. In Melbourne, this is illustrated by several recent online articles exploring road harassment and the gendered experience of cycling culture[195]. In France, some cyclists have made satirical videos in order to highlight the issues faced by female cyclists on the road, whether they are cycling for utilitarian reasons[196] or for sporting purposes[197]. In Lyon and Melbourne, Facebook groups created for female cyclists have become increasingly popular in recent years (in January 2022, "Le groupe des lyonnaises à vélo" had almost a thousand members, while "Girlride! Melbourne" stood at about 2.2 thousand members). In Lyon, the administrators of the Facebook group stated that they viewed this success as an illustration of the difficulties faced by female cyclists in the city.

Female cyclists in Lyon and Melbourne regularly face harassment, to the point that one respondent was even present during an attack on a women's cycling race:

> *It was an event for women, part of their strategy to increase the participation of women cyclists, to try and increase women's confidence and comradery amongst women cyclists. There were community opposition: people put tacks out so we'd get flat tyres and they spray-painted the pavement where we were gonna ride: "dykes, get off your bikes", "you're not welcome". But also, in response to that, there was this huge*

---

[195] Read, for instance, the blog post by Lauren O'Keefe, "Chasing Joy" (URL: https://medium.com/@wordynerd/chasing-joy-2315da88b0d6m accessed January 2022), or the article written by Merie Polkamp in the Sydney Morning Herald entitled "Male cyclists of Melbourne, what the hell is your problem?" (URL: https://www.smh.com.au/opinion/male-cyclists-of- melbourne-what-the-hell-is-your-problem-20171017-gz2igy.html)

[196] For instance, see the video « Être une femme à vélo, toute une expérience » by Broute, broadcasted on the channel Canal + (URL: https://www.youtube.com/watch?v=RL21bjuANY0)

[197] Cyclist Julie Dremière shared a story about a man getting sick because he desperately wanted to pass her while cycling, a story that attracted widespread coverage, for instance in the newspaper Les Inrockuptibles (URL: https://www.lesinrocks.com/actu/video-la-cycliste-julie-dremiere-epingle-ces-hommes-vexes-parce-quelle-les-depasse-174301-20-07-2020/)

community support from everyone who was in favour of the event. People had deckchairs out, they were clapping when you went by, etc.

Caitlyn, cyclist, Melbourne

No Lyon cyclists interviewed in the present research reported such violent opposition to female cycling. However, in both cities, it is common for female cyclists to be honked at or yelled at. One road cyclist even mentioned that someone had once spat at her at while she was riding in Lyon. Many female sports cyclists also tell stories of not being integrated fairly into group rides. Overall, in both cities, women are likely to face a certain level of hostility while cycling.

According to Young, this patriarchal context constitutes an impediment to the way women's bodies move, contributing to the production of a "feminine motility" that she describes as the "particular style of bodily comportment that is typical of feminine existence" (Young 1980:31). It leads to a permanent self-awareness that inhibits their intention and impedes the naturalness, and thus the "efficiency", of their movements[198]. Consequently, women, who experience themselves as fragile, often show hesitancy and uncertainty when engaging in physical movement, and thus lack of confidence in their own skills. This "feminine doubt" (Casselot 2018) is therefore anchored in the specific conditions of existence of the feminine body, and restricts the scope of women's movements and actions[199].

Female cycling practices are thus inhibited by the frequent harassment and threats that they deal with in public spaces. Studies investigating the intersection between gender and cycling confirm the inhibited cycling practices of women, who are less likely than men to cycle in most of the richest countries, which include both France or Australia (Pucher and Buehler 2008).

---

[198] According to Merleau-Ponty, to be transcendent and act efficiently on its environment, a "body must not belong to the realm of 'in-itself'" (Young 1980:38)

[199] Following de Beauvoir, Young uses the term "femininity" to describe the typical way in which women experience the typical situation in which they find themselves in a particular society: "This understanding of 'feminine' existence makes it possible to say that some women escape or transcend the typical situation and definition of women in various degrees and respects." (Young, 1980:31)

Since riding a cycle blurs the lines between transportation and physical activity, one aspect of this domination is the widespread sexism present in sports (Barbusse 2016), including in competitive cycling (Djepa 2019). This domination can also endanger women physically: for example, when passing, cars leave less space for female cyclists than for male cyclists (Evans, Pansch, and Singer-Berk 2018), and women are more frequently victims of incidents and near-misses (Aldred and Goodman 2018). While cycling, women tend to be less confident (Dill and McNeil 2013; Akar, Fischer, and Namgung 2012) and less willing to ride on their own (Gardner 1998). Female cyclists also exhibit stronger preferences for off-road and protected cycle infrastructure (Aldred et al. 2016) and express more concern with traffic safety and personal security (Heinen and Handy 2012).

These differences observed in practice are anchored in the materialities of cycling: gender norms around cycling are strongly embedded into the object-cycle, along with the ways in which cycles are advertised, sold, and used by cyclists of all genders.

1.b. A Gendered Relationship with the Cycle as an Object

Gender norms express themselves materially in cycling cultures. The quantity and type of cycles and cycling equipment owned by men and women are shaped by these gendered cycling cultures, and by domestic mobility work as well as inhibited cycling practices.

Owning More Cycles

Men own more cycles than women on average. Women are less likely to have access to a cycle of their own (Abasahl, Kelarestaghi, and Ermagun 2018). Furthermore, data from the cycle repair survey, collected from respondents who own at least one cycle, reveals that men own on average a higher number of cycles than women: overall, 48% of female cyclists report owning only one cycle, compared to 30% among their male counterparts. Men are also the most likely to own a very high number of cycles: 15% of male cyclists report owning five cycles or more, whereas only 4% of female cyclists are in a similar position (Figure 5.2). Lyon cyclists own fewer cycles on average than Melbourne cyclists; despite this, however, this gendered discrepancy in

cycle ownership manifests to a similar degree in both cities.

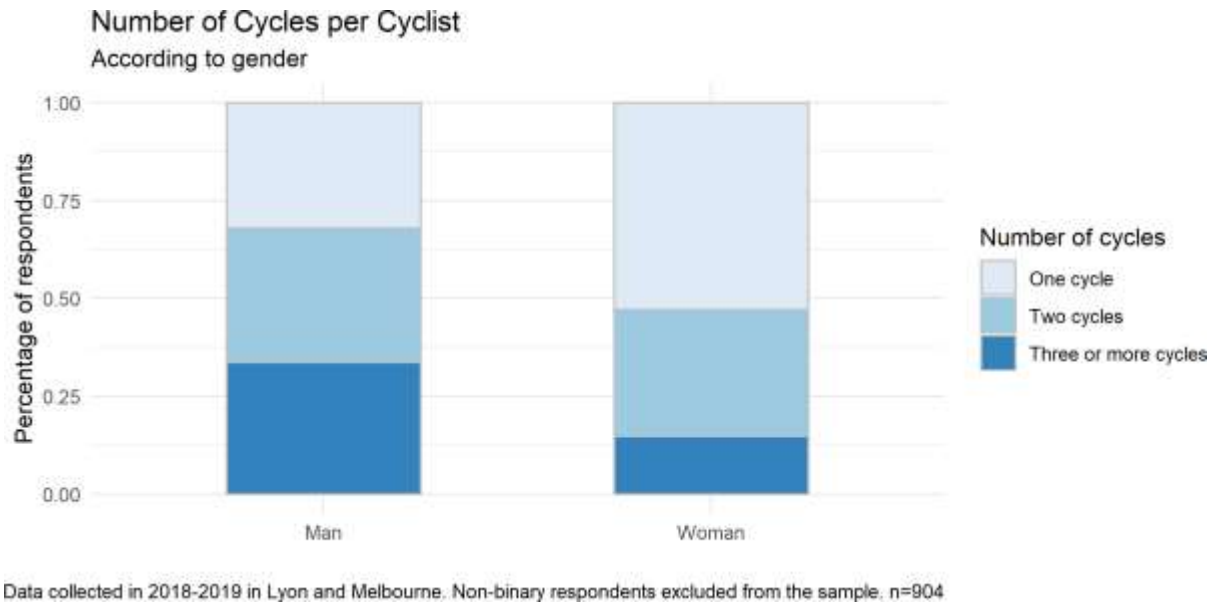


Figure 5.2 - Number of cycles owned according to gender

This gendered discrepancy in cycle ownership is all the more noticeable in the case of heterosexual couples, in which the man often owns many cycles for a range of uses, while the woman only owns one:

> *We are quite well-equipped with bikes… My partner has a city bike that he uses less than I do, because he goes to work by tram. This is just for transportation, but he's also got a racing bike, which he also sometimes rides to work. He also had a cross-bike… a mountain bike, that was stolen from us. And he got the exercise bike when he had to retrain his knee after some surgery. My own bike is a bit old, it is a Peugeot.*[200]
>
> Marie, cyclist, Lyon

[200] « On est plutôt fournis en vélos… Mon conjoint, lui a un vélo de ville qu'il utilise moins que moi, parce qu'il utilise le Rhône-Express pour aller au travail. Ça c'est juste pour les déplacements mais il a aussi un vélo de course, avec lequel il va aussi parfois à l'aéroport. Il avait aussi un vélo… cross, les vélos de montagne là, qu'on s'est fait voler. Et le vélo d'appartement c'est parce qu'il a dû faire de la rééducation à cause d'une opération du genou. Mon vélo est un peu vieux, c'est un Peugeot. »

This gendered gap in cycle ownership begins with the gender-based differences in the opportunities afforded to children, as argued by Sayagh (2018). Joyce, for instance, was refused a cycle when she was a child, because the priority was given to her brothers in a context of relative poverty, and cycling was considered too risky for women:

> *I wasn't allowed to have a bicycle when I was a young girl. I have a big family, I was one of eight, and my mother had had a bicycle accident when she was young, so she didn't encourage us to have bikes, and also we were not able to afford bicycles. So only my brothers got bikes.*
>
> Joyce, cyclist, Melbourne

In short, the domestic mobility work expectations that women contend with in the course of their cycling practices are embodied in the number of cycles that they own.

Owning Different Cycles

The shapes, types, and functions of cycles are also heavily gendered, informed by the concepts of domestic mobility work and inhibited practices discussed above. This gendering occurs in different ways. On the one hand, cycles are designed in a way that is scripted, in the sense that designers embed gendered meanings into them. As stated by Cox:

> The mobile subject is itself "designed" through the scripts provided by the bicycles as objects and their sales materials. Although the physical design of the bicycle is relatively static, the manner in which it is mobilised through connection to other tropes creates the user as a political subject and legitimates specific mobility practices as part of that political subjectivity. (Cox 2017:59)

On the other hand, users appropriate cycles in ways that can transform or confirm these scripts (Akrich 1992), which is why the same cycle models and shapes can be associated with very different meanings in different contexts, as demonstrated by Lucy Baker's study of cycles

shipped from England to Namibia (Baker 2018). Overall, the design of cycles acts as a connector between people and meanings (Yaneva 2009), facilitating certain practices while impeding others in a gendered way.

The gendering of cycles thus fluctuates across time and place: in Great Britain and the United States of America, cycle advertising historically emphasised women's autonomy in cycling and presented men and women as equal cyclists up until the Second World War (and the decrease in cycle sales during that period); subsequent advertisements for cycles were characterised by stronger gender differences and a patronising attitude towards women, who were explicitly subjected to the male gaze (Cox 2019; Guroff 2018). Cycling advertisements in pre-war Germany did not draw the same associations between female cycling and female autonomy as their British counterparts (Cox 2017).

In France, cycles provided to children and teenagers differ substantially between genders. Sayagh showed that children's cycles marketed to girls were more likely to be pink (81% of girls' cycles in the sample were pink), as well as to be equipped with mudguards, a child's seat, and pompoms. Cycles targeted at boys were more likely to be mountain cycles or BMXs, as well as to have front or back wheel suspension, a drinking bottle, or handlebar bar ends (Sayagh 2018: 173). These cycles associate masculinity with action, competition, risk-taking, and the outdoors; by contrast, girls are encouraged to think of softness, the domestic space and house chores (specifically childcare), and comfort, as well as to perceive cycling as a mostly utilitarian mode of transportation (Sayagh 2018: 166). Girls' cycles thus reflect the imperatives of domestic mobility work associated with femininity. This difference in equipment persists among adults. According to the cycle repair survey, men and women own very different types of cycles: men are far more likely to own mountain cycles or road cycles, whereas women are more likely to be owners of city cycles.

Besides this, gendered cycle preferences differ between both cities. As illustrated in figures 5.3 and 5.4 below, cycle ownership in Lyon appears more strongly gendered than in Melbourne. Indeed, in Lyon, men are twice as likely as women to use a road cycle (17% of women and 40% of men ride a road cycle), whereas in Melbourne – where half of all cyclists use this type of

cycle – this discrepancy is far smaller. Indeed, in the Australian city, 48% of female cyclists and 52% of male cyclists ride a road cycle. Similarly, city cycles are equally popular among men and women in Melbourne, whereas these are predominantly female objects in Lyon: 50% of female cyclists ride one of these cycles, compared to the 28% of male cyclists who do so. Mountain cycles are the only common type of cycle that is gendered in a similar way (heavily favoured by men) in both Lyon and Melbourne.

This initial analysis seems to indicate that cycles are more heavily gendered in Lyon than in Melbourne. However, this trend appears to reverse when less common types of cycles are taken into account.

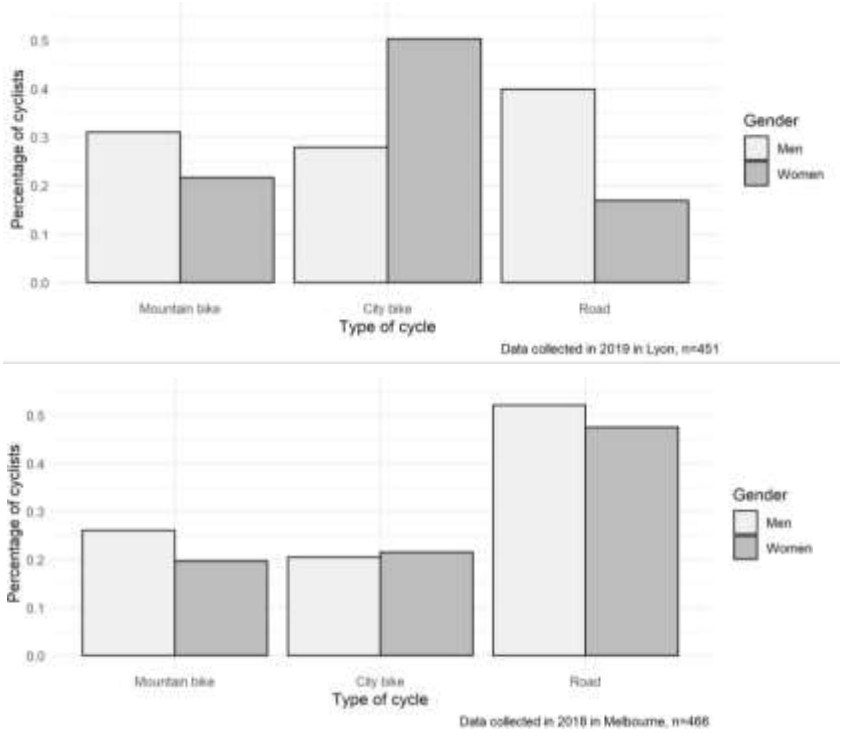
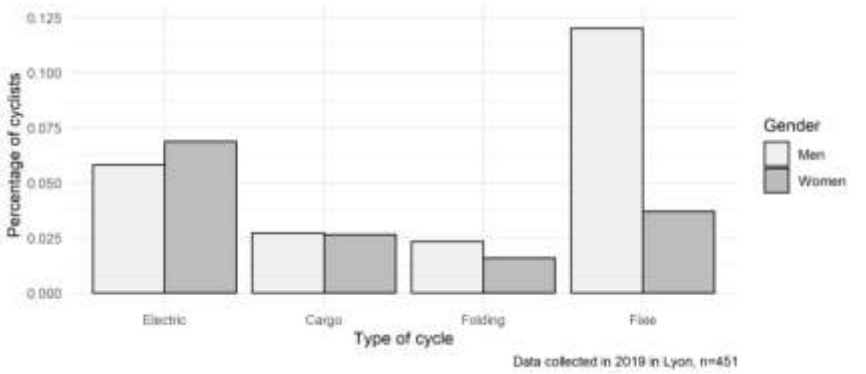


Figure 5.3 – Type of cycles owned by cyclists in Lyon according to gender (most common types of cycles); Figure 5.4 – Type of cycles owned by cyclists in Melbourne according to gender (most common types of cycles)



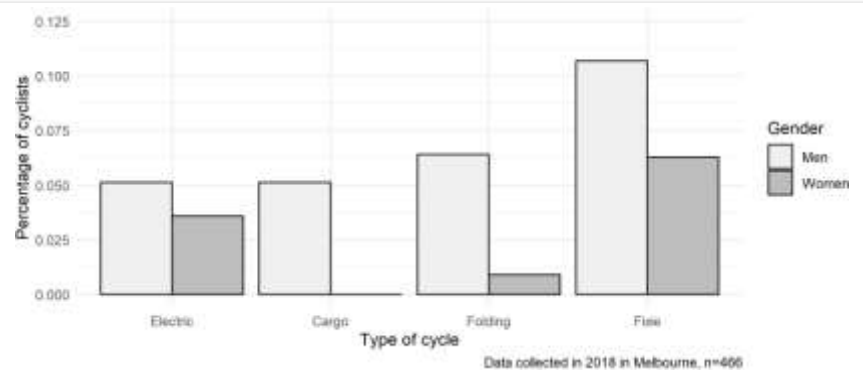


Figure 5.5 - Type of cycles owned by cyclists in Lyon according to gender (less common types of cycles); Figure 5.6 - Type of cycles owned by cyclists in Melbourne according to gender (less common types of cycles)

In Melbourne, men are more likely to ride electric cycles, cargo cycles, or folding cycles (as displayed in figure 5.5), whereas male and female cyclists in Lyon report a similar ownership rate for these types of cycles (figure 5.6). The only uncommon type of cycle that is heavily gendered in both cities is the "fixie", or fixed-gear cycle: this type of cycle is strongly favoured by men in both Lyon and Melbourne. The cyclists involved in this practice describe a very masculine culture of risk-taking:

> *My boyfriend was really into riding fixed-gear bikes, with what I called the fixie kids – I say kids, but they're in their twenties. I went with them once. And I found that a lot of those guys, and they were almost all guys, were all younger than me. I was just too old and boring, I couldn't deal with it. I just turned into everyone's mom. So, I mean, I'm all*

for having fun, but I'm also trying to be safe at the same time, and I'm trying not to be a dick about it.

Cassie, cyclist, Melbourne

Independently of the category of cycle, the type of frame is also often gendered: in Lyon, as in Melbourne, a step-through frame cycle is considered to be for women only, in opposition to a diamond-frame cycle; some cyclists who ride what is considered by many to be a cycle intended for the other gender face mockery in the street, and sometimes also in cycle shops. Despite this, some cycles are designed with unisex frames, like small-wheelers, and specifically cycles from the brand Moulton, which were advertised in the 1960s on the basis of their universal shape (Cox 2017).

Overall, cycles associated with masculinity allow riding in difficult terrain or at higher speed, whereas women's cycles are more comfortable at slower speeds, when carrying items, or on utilitarian trips. These features correspond to the imperatives of domestic mobility work and emphasise a focus on safety made necessary by the inhibited cycling practices of women. This may sometimes lead to paradoxical situations, such as when Léonard, a respondent who cares about riding speed more than anything else, ultimately purchased a high-end road cycle despite doing almost no riding outside of the city:

I didn't get the mountain bike, because for urban trips it is quite complicated: it is heavy, you aren't as agile as with a race bike. I have a cousin working in sports, and he told me, "a hybrid won't work for you, if you want to go out of the city and ride for fun, with a hybrid bike you won't get the feeling of speed." And that's what I look for, the feeling of speed, and so I went for a race bike. [...] It was only eight kilos, it was quick. Quick, that's what I liked.[201]

[201] « Le VTT, je n'ai pas pris parce que pour les trajets urbains c'est quand même compliqué, c'est lourd, t'es pas aussi agile qu'avec un vélo de course. Un cousin qui bosse dans le milieu du sport m'a dit "VTC ça t'ira pas parce que si tu veux faire des sorties avec un VTC tu n'auras pas la sensation de vitesse". Et moi c'est ce que je cherche, la sensation de vitesse-rapidité, et du coup je suis parti sur un vélo de course. [...] Mais c'était un truc qui faisait 8 kilos, qui était vif quoi. Vif c'est ce que j'appréciais. »

Léonard, cyclist, Lyon

Gendered Cycling Equipment

The last material aspect of gendered cycling practices is the difference in the equipment used by male and female cyclists. The gendered differences in equipment noticed among children continue into adulthood. Indeed, women are more often equipped with accessories that facilitate the transportation of children or objects (Raibaud 2015: 135); I also observed this phenomenon during fieldwork.

One Lyon mechanic interviewed shares this opinion:

> *I see chicks ride on junk bikes with the kids, the groceries, and they have the helmet, they have everything. I find that today, female customers, even for the business, they're more interesting than guys. Because the girl will fit a basket on her bike, she'll get equipped… She wants to be autonomous, actually, I think. They buy a helmet. Whereas guys, no, they're in t-shirts, playing the hunk, showing off on the docks, checking out the girls, and that's it.*[202]

Val, mechanic and owner, Lyon

Once again, this difference in equipment is related to the imperative of domestic mobility work. Chores such as grocery shopping and childcare, which remain primarily the responsibility of women (Bereni et al. 2012), require certain cycling equipment. Women are also expected to maintain a certain appearance regardless of weather conditions (Cárcamo, Moreno, and del Barrio 2021), and thus favour rainproof equipment and mudguards. This abundance of equipment also matches women's higher preoccupation with safety (Aldred et al. 2016; Götschi

[202] « Moi je vois des meufs rouler sur des épaves avec les gosses, les courses, et elles ont le casque elles ont tout. Je trouve qu'aujourd'hui la clientèle femme, même pour le business c'est plus intéressant qu'un mec. Parce que la fille elle va mettre un panier, elle va s'équiper… elle veut être autonome en fait j'ai l'impression. Elles achètent un casque tandis que le mec non, c'est t-shirt beau gosse sur les quais à faire le kéké à mater les nanas et voilà. »

et al. 2018) and their inhibited cycling practices. Women are more likely to be worried about accidents, and thus equip themselves with helmets, high-visibility gear, and good lights.

Men in Lycra and the Gendered Cycling Culture in Melbourne

Overall, the gendered experience of cycling in the streets of Lyon and Melbourne takes different material shapes. In Melbourne, for example, the existence of state laws that mandate helmets mean that some female cyclists feel challenged by their desire to preserve their hairstyle and complain about "helmet hair", an issue that male cyclists tend to complain about less frequently. However, the helmet is not only an item that infers with a gendered sense of fashion and style: it also represents a cycling culture that, in Australia more than in France, is heavily centred around sports and the associated masculinity. In Melbourne, many cyclists expressed their relationship to cycling by comparing it to the stereotype of "men in lycra", which to them represents "the proper cyclist". This impression is even stronger among women, who feel even less represented by this stereotype (which is, by default, male, as expressed by the acronym "MAMIL" for Middle-Aged Men In Lycra). One example of this was raised by Mary, a cyclist who described not feeling comfortable in a cycle shop that felt "very boys-y" to her:

> *[It felt like] they're really only there for, you know, for the dudes that wear Lycra. And you know, I wear Lycra when I take long rides, but I kind of feel that I wasn't really their key market. I just want to ride a bicycle, it's just a bit different from what they're all about.*
>
> Mary, cyclist, Melbourne

Cyclists often experience a feeling of illegitimacy (Aldred 2013a). In Mary's example, this feeling is related to the masculinity that she associates with the sports culture of cycling. Typical women's clothing is perceived as non-sportive and thus not legitimate in the context of cycling:

> *I wear work clothes to ride, but I'm confident and I'm not slow, and often men pass you, or go ahead of you in the lane, make this level of assumption that you are gonna be*

slow because you have a rack at the back, or because you are wearing a dress. And I've actually had people say to me at the next set of lights, "jeez, for someone in sandals", or "for somebody in a dress", "you really burned my ass there". Yeah, I'm not racing you, this is just my way to work, I ride this way every day.

Caitlyn, cyclist, Melbourne

Overall, the masculinity of material cycling cultures expresses itself differently in Lyon and Melbourne. While male and female cyclists ride very different cycles in Lyon, this phenomenon is less evident in Melbourne; on the other hand, women engaging in utilitarian cycling in Melbourne suffer from the frequent reference to sports cycling, a heavily masculine environment within which signs of femininity are belittled.

1.c. The Gendered Share of Material Interactions within Heterosexual Households

The previous subsections have explored the gendered expectations embedded in the materiality of cycles. This gendering of the cyclist–cycle relationship comes into play within the social relationships with which cyclists engage. One of the many forms of social relationship in which many people are or are likely to become engaged is the heterosexual relationship. Materialist feminist research considers that these relations are at the heart of some aspects of the gendered domination[203] between men and women (Rich 1981; Wittig 1992; Delphy 2003; Clair 2013). This domination is most apparent in the case of household chores, since women remain primarily responsible for them in both France (Delphy and Leonard 2019) and Australia (Ting, Perales, and Baxter 2016), as well as in all OECD countries (Miranda 2011). However, this domination also expresses itself in many other gendered issues: for example, in women experiencing high amounts of pressure and violence in the field of sexual and contraceptive practices, both in France (Roux 2021) and in Australia (M. Kelly et al. 2017), to the point that

[203] In *The Straight Mind*, Monique Wittig conceptualised heterosexuality as a political system that assigns men and women to gendered roles and opposed classes of sex. She argues that heterosexuality is a system that enforces gendered division of labour, gender hierarchies, and the male appropriation of women's productive and reproductive capacities (Wittig 1992).

heterosexual relationships are a focal part of what has been termed "the continuum of sexual violence" (L. Kelly 1987). The organisation of heterosexual households shapes women's involvement in the labour market (Foster and Stratton 2018), their incomes (Klawitter 2015), and on a wider scale, the current economic organisation of labour (Federici 2019).

Overall, although women who are not involved in heterosexual relationships are also faced with heterosexual gender domination (as in the case of street or workplace sexual harassment), heterosexual relationships are a central space of the operation of gendered dynamics. Indeed, it is within heterosexual relationships that many decisions are made regarding cycling between men and women. Cycles are not individual objects: they are often gifts from a partner, are sometimes owned in common, are used in the frame of couple or familial practices, and their maintenance can be realised by a person in the household other than the one who owns them. Heterosexual relationships are thus spaces in which the gendered aspects of cycles come into play and are negotiated.

Purchasing a Cycle in a Heterosexual Couple

One arena in which this negotiation occurs is the cycle purchases of heterosexual couples. In several English-speaking Facebook groups set up for discussion among cyclists, cycle purchase is represented as the most desirable activity. A new cycle is nicknamed an "n+1", referencing a joke popular among amateur cyclists: "what is the ideal number of cycles to own? n+1, with n being the number of bikes you already have".

In the Facebook group "Funny side to bike mechanics", where cycle mechanics post memes and jokes about their experiences with difficult customers, one common theme is wives' disapproval of the purchase of new cycles. One of the memes shared in this Facebook group features several stock images: a man in a cycle shop, two tyres on his shoulder, smiling; a woman staring angrily, her hands on her hips; a man sitting on the floor, holding his face with his hands; finally, the first picture again. Under these pictures are the following captions: "When I'm sad, I buy bike parts. When I buy bike parts, my wife gets angry. When my wife is angry, I get sad. When I'm sad, I buy bike parts." This post, like several others, represents wives as

getting in the way of a male cyclist achieving his most desired goal in life. In other stories, cycle shop employees act as accomplices for the husband, aiding him in lying to his wife about the price of the cycle by issuing fake receipts, or packing expensive bike parts in a plain bag (without the shop's logo on it) to help him conceal a new purchase.

This stereotype of women caring about the finances of the relationship while men appreciate their leisure is representative of the gendered share of leisure within households. Indeed, a study of lawyers' leisure time in Canada showed that men's comparatively lesser involvement with house chores and childcare allows them to combine leisure with their work and family, whereas marriage and children reduce women's opportunities for leisure (Wallace and Young 2010):

> In contrast, men appear to be better at protecting their free time from their family responsibilities, whereas women's leisure is more likely interrupted, intertwined, and fragmented because of the demands of their family's needs. While women have increased their participation in the labor force, both Canadian and American data suggest men spend more time in paid work with higher wages and more prestigious jobs in addition to more time in leisure activities. (Wallace and Young 2010)

Another point of amusement regarding the cyclist's relationship status in online cycling communities relies on the representation of the love felt by the male cyclist towards their cycle as stronger than the love felt for his wife. For instance, one post in the group tells the story of a male cyclist, whose wife has disappeared along with his mountain cycle, giving a statement to the police. The cyclist cannot remember his wife's height, hair colour, or eye colour, but remembers the brand, colour, shape, and model of every component of his bike. The police officer eventually concludes with an encouragement: "Take it easy, sir. We'll find your bike". This satirical story finds its humour in the fact that many men somehow relate to the man preferring his cycle to his wife. Such an approach deepens the understanding of the masculinity associated with cycling practices: this masculinity stems not only from an association between cycling and masculine values that can lead women to exclude themselves from cycling spaces, but also from the (sometimes explicit) desire of male cyclists to maintain a male-only space

(Tissot 2014). This phenomenon of active exclusion appears in a range of socio-economic environments, from working-class men engaging with DIY, gardening, and fishing as a way to escape familial pressure (Schwartz 2002 [1989]) to young soccer players constructing their masculinity around the domination of women (Damont and Pégard 2017), golf players demeaning female players (McGinnis, McQuillan, and Chapple 2005), or high-end automobile clubs that do not admit women[204].

Besides these rather extreme cultural representations of cycle purchases in online cycling communities, individuals who purchase a cycle often are influenced by the heterosexual relationship of which they are a part. In many cases, women ride a cycle that was gifted to them by their male partner, which can cause issues when the purchase does not take their personal preferences into account:

> *But it's amazing how passive people come in, especially when they see the whole range of bikes, they just go, "I don't know anything about bikes". You gotta fight back to say "you probably know what it is you want, work with that". Sometimes we don't sell bikes to people because we know it's a good bike, but it's actually not the right bike for the person. A lot of, particularly guys, come and say, "I think my girlfriend needs a bike", which she doesn't normally ride. We're often hearing, "I'm getting it for my partner as a present" that they may or may not want. And sometimes their partner is with them and still doesn't want it.*
>
> Walter, community workshop volunteer, Melbourne

In the course of this research, several female research participants informed me that they had been gifted an old and inefficient cycle by their boyfriend. Another female cyclist told me of begging her boyfriend to let her purchase a new cycle after discovering that hers was of very bad quality. This echoes sociological research showing that, in addition to having less leisure

[204] Read, for instance, "Paris's 126-Year-Old Auto Club Still Says 'Non' to Women Members", Bloomberg, December 2021. URL: https://www.bloomberg.com/news/features/2021-12-17/paris- s-126-year-old-auto-club-still-says-non-to-women-members

time available than their male partners, women's leisure activities are often restricted and conditioned by these partners (Herridge, Shaw, and Mannell 2003; Farrell, Fink, and Fields 2011).

Transforming a Cycle in a Heterosexual Couple

It is not only the acquisition of a cycle but also its shape that can be negotiated within heterosexual relationships. For instance, Noël has transformed the tandem that he uses with his wife to take a range of factors into account; one of these is the fact that she is, according to him, less used to riding and to changing gears:

> *I also changed the position of the derailleurs – I moved the gears to the back. First of all, it allows me to use shorter cables, which provides more strength. Also, I am the one managing the gears, and she does the steering and the main brake. She is less used than I am to riding, to changing gears. Well, the cable housing is shorter, it provides more strength, but also I have better visibility of the pedals, and since I'm bringing the most power on the tandem, well, I tend to adjust gears to my pedalling rhythm.*[205]
>
> Noël, cyclist, Lyon

The couple's modified cycle prevents Noël's wife from making certain decisions, and thus limits her acquisition of competences useful to cycling practices, such as gear shifting. In other cases, moreover, the morphology of a cycle is adapted to allow the fair inclusion of the woman in her partner's riding practices. For instance, Florent explained that he and his girlfriend both rode a fixed-gear cycle. However, their cycles had different gear ratios, meaning that if they were to ride at the pace that was most comfortable for each of them, they would ride at very different speeds. In light of this, Florent decided to change the gear ratio of his cycle so that he would

[205] « J'ai changé aussi la position des dérailleurs, j'ai déplacé les vitesses à l'arrière, déjà ça fait des trucs plus courts, ça donne plus de force. En plus c'est moi qui gère les vitesses et elle la direction et le frein principal. Elle a moins l'habitude de faire du vélo, de changer les vitesses. Bon les gaines sont plus courtes, ça donne plus de force, mais en plus j'ai le pédalier juste devant donc je vois très bien où est passé le… et comme sur le tandem c'est moi qui suis le plus puissant, j'ai tendance à régler les vitesses pour pédaler quoi. »

ride at a slower pace, one that would match his girlfriend's, during a cycle trip that they were planning to undertake together. This solution respects the velonomy of his partner while leaving her some space for improvement.

The lower share of women riding in both Melbourne and Lyon expresses itself through a gendered material relationship with the cycle. This gendered relationship is created, reinforced, and sometimes negotiated within a range of social interactions, one of which is the heterosexual relationship. Gendered velonomies thus express themselves through various interactions: those with the cycle as an object, and those with the people by whom the cyclist is surrounded.

Female cyclists are thus restricted in their use of the cycle by gendered norms that transform the cycles and equipment that are associated with men and women, as well as the uses that women are expected, and encouraged, to make of them. This gendered velonomy is also expressed in another form of interaction between cyclists and the cycle: repair and maintenance practices.

2. Gendered Repair and Maintenance Practices[206]

This section focuses on the obstacles faced by women when engaging with repair practices.

2.a. Gendered Repair and Maintenance Practices: Overview

Women and Technical Work

In the above, I discussed gendered cycling practices. The patriarchal society that exists in both Lyon and Melbourne discourages women from cycling, which gives them less opportunity to repair cycles and to become velonomous.

When repairing or maintaining a cycle, female cyclists are faced with the same issues as highlighted in the previous section. On the one hand, as theorised by feminist phenomenology, their body is inhibited by the patriarchal environment in which repair takes place, making the realisation of these manual operations more difficult for them. On the other hand, following materialist feminism, we can argue that the containment of women to reproductive labour and domestic tasks is made easier by their lesser degree of ease with cycling repair and maintenance, both of which are necessary in order to become velonomous.

Overall, women face many obstacles when engaging with manual labour, tools, and technology. In most cultures throughout time, men have had a monopoly over the fabrication and repair of the productive tools used by women (Tabet 1979:54). Feminist studies of science and technology have attempted to describe and deconstruct this "taken-for-granted association of men and machines" (Wajcman 2010), while the French sociology of labour began to adopt a gender lens in the 1990s (Malochet 2007). Women are frequently excluded from manual and technical activities from a young age (Mosconi and Dahl-Lanotte 2003). Even firms that intentionally hire women in prominently masculine occupations frame their participation in essentialist terms. The praise of feminine values such as meticulousness, care, rigor, and

[206] A wide part of the analysis developed in this section was initially published as a chapter in the book Cycling Societies (Abord de Chatillon 2021)

softness comes with criticism of the perceived downsides of women's participation in masculine workplaces (for example, their perceived emotionality or lack of creativity). This essentialist approach is detrimental to the involvement of women in technical and manual work (Epiphane 2016).

In male-dominated areas of employment, women often have to deal with everyday sexism, harassment, and the need to negotiate gendered expectations (Cassell 1997; Smith 2013a; 2013b). Georgine Clarsen argued that scientific research should pay some attention to manual trades as spaces in which "a particular kind of masculine culture [...] is used to justify the exclusion of women" (2019:15). Cycle shops are no exception to this, and the rare women employed as mechanics encounter a range of difficulties (Laker 2018). However, the gendered aspects of cycle repair and maintenance environments are yet to be discussed in the scientific literature. The following subsection provides an initial overview of the repair gender gap that exists in the cities of Lyon and Melbourne.

Repair and Maintenance: Heavily Gendered Practices

One early result of the repair and maintenance survey is that women tend to be less experienced than men with cycle repair and maintenance skills. They are overwhelmingly less likely to agree or to strongly agree with the statement "when I have access to the right tools, I find it easy to repair most problems on a bicycle" (Figure 5.7).

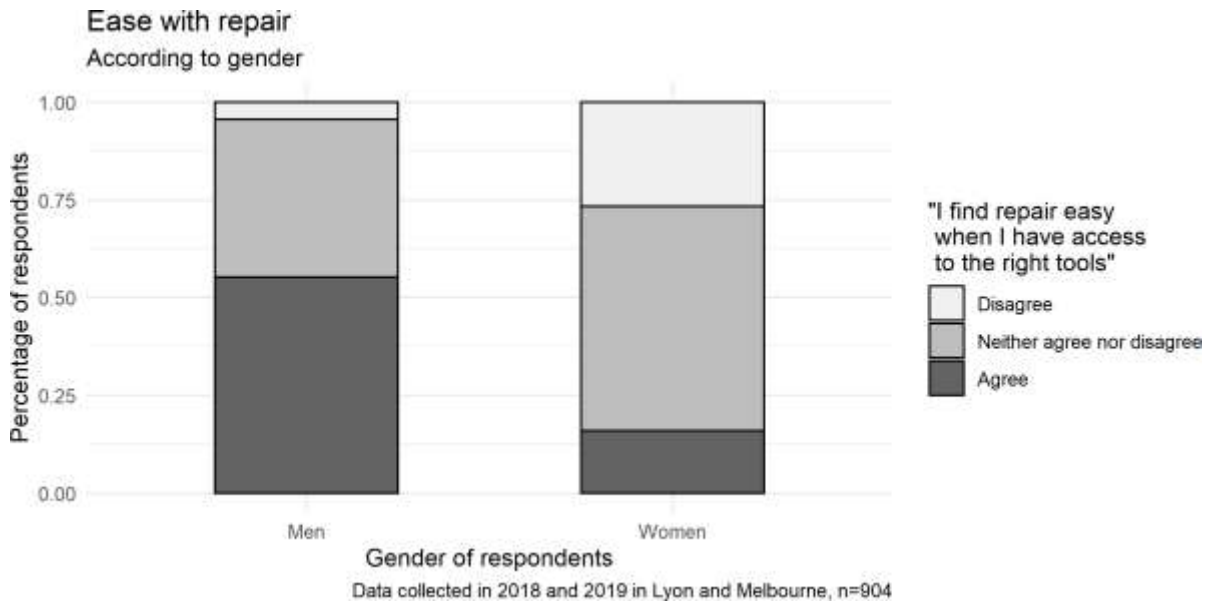


Figure 5.7 – Stated overall ease with repair according to respondent gender

Men overall reported greater ease in general, but also with each specified repair and maintenance operation. Female respondents were over three times more likely than male respondents to have never performed brake adjustment on a cycle (Figure 5.8).

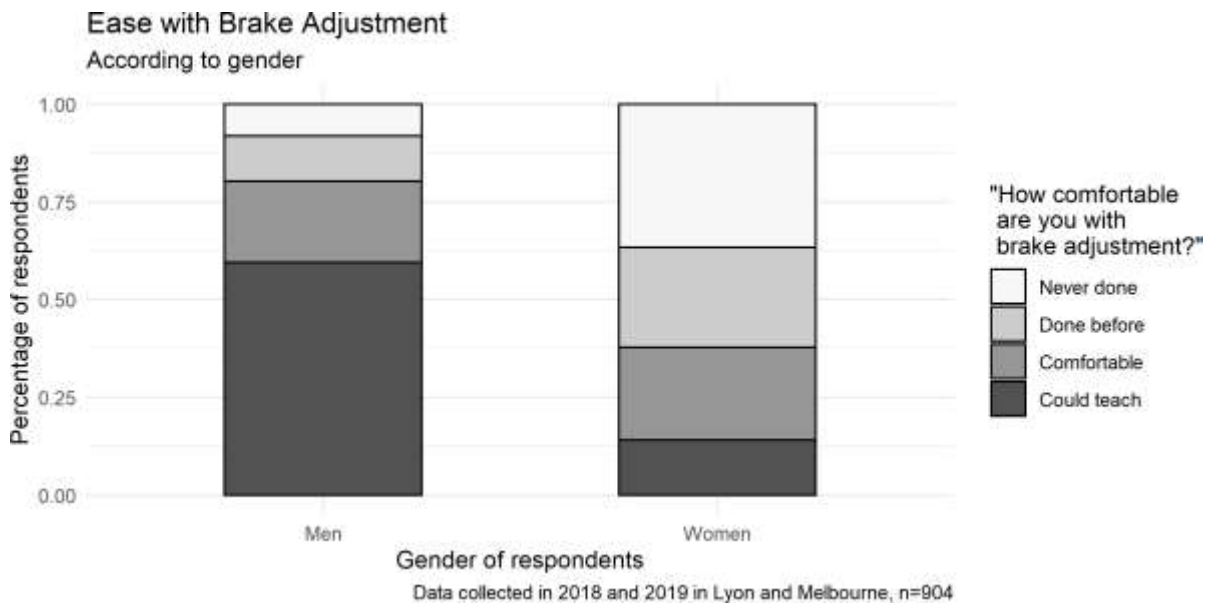


Figure 5.8 – Stated experience with adjusting cycle brakes according to respondent gender

This repair skills gender gap is also visible in a task considered by many to be the most basic of repairs, namely puncture repair. Twelve per cent of the women surveyed had never performed this task, whereas this was only the case for 2% of male respondents (98% of men felt "comfortable" with this task).

A crucial element of the context in which women find themselves when engaging with repair or maintenance is thus a relative lack of experience and skills, along with a general association between repair and masculinity. This lesser degree of experience with repair is probably the reason why, when faced with a cycle breakdown, women were more likely to take it to a shop and less likely to bring it home to repair it, or to go to a community workshop (Table 5.1).

	Brought it to the shop	Community workshop	Fixed it on the spot	Brought it home to fix it	Did not do anything
Men	33% *(157)*	13% *(61)*	20% *(93)*	44% *(208)*	4% *(18)*
Women	49% *(190)*	8% *(30)*	16% *(61)*	32% *(124)*	3% *(12)*

Table 5.1 - Action taken the last time the respondent's cycle broke down (according to gender)

Furthermore, women were more likely than men to solve a cycle breakdown with someone else's help (83% of women compared to 55% of men). This includes people who visited a cycle shop, but also applies to help received from a friend or acquaintance (30% of women compared to only 7% of men). Thus, men are often more experienced with repair, as well as more likely to repair their cycle themselves and without help. When their cycle requires repair, women are more likely to depend on professional mechanics (who themselves tend to be men), or on friends and acquaintances.

Finally, there are comparatively few women in repair spaces overall. In their study of Brussels self-repair workshops, Batterbury and Vandermeersch made the following observation:

> Workshops replicate the skewed gender relations found among bike riders. Most volunteers and visitors are men. Very few women in Belgium are trained bike mechanics and Brussels is no exception. The general view is that it is a man's job, although women are of course found in bike shops and cycle teams in positions of responsibility as managers, in charge of logistics or particular non-mechanical tasks. (Batterbury and Vandermeersch 2016: 195)

In Melbourne, in 2016, there was only one female cycle mechanic for every 20 males (Bourke 2016). Moreover, as suggested by Batterbury and Vandermeersch, the rare women who do engage in repair spaces are sometimes driven away from mechanical tasks. This sometimes occurs because of their personal preferences, as was the case for Isabella, who argues that while men are in general not very good at organising things, she herself is; as a result, she gladly contributes to improving the operation of the workshop in this way, even though she originally began to attend to learn repair skills:

> *Some things have caused Greta a bit of stress because the guys, being guys, will kind of just work right up until 3 o'clock when we close, and then just throw the tools inside and not give a thought about it. So we're working towards systems for that, we're trying to work better to anticipate those things and be prepared. And yeah, I definitely… I'm much happier to go in there and organise things and clean things, uhm, keep all the tools and stuff in the right place and let the guys fix the bikes. I just love being organised, [laughs], I find that stuff really satisfying, so yeah, it's just about complementing each other and working together.*
>
> Isabella, community workshop volunteer, Melbourne

In other cases, however, women are driven out of professional mechanic positions. For instance, I met several female mechanics, who had been formally trained as such, who recounted stories of managers asking them to work as a salesperson instead, arguing that they as women would sell more product. Without extensive experience as a mechanic, it was sometimes difficult for them to oppose such suggestions from management.

2.b. Repair Spaces as a Patriarchal Environment

Feminist phenomenology suggests that the source of women's inhibited practices is the patriarchal society in which they find themselves. This section describes the environment in which repair and maintenance takes place and shows that it is highly masculine and patriarchal. Indeed, women frequently receive inappropriate attention and see their expertise denied in repair spaces.

The Masculinity of Repair

The previous subsection has outlined the stark differences in repair and maintenance skills and confidence between men and women. In addition, cycle repair and maintenance spaces are overwhelmingly masculine; indeed, most professional mechanics and volunteers in community workshops are men (Jose 2012; Laker 2018).[207] Women engaging with repair thus find themselves in a very masculine environment. This masculinity alone does not make the environment of cycle repair patriarchal; however, as argued by Clarsen, "those workplaces are not accidentally or coincidentally male-dominated" (Clarsen 2019:34). The masculinity of repair spaces derives from mechanisms that actively operate to exclude women.

One mechanism of exclusion observed in these spaces is a culture that is sometimes extremely masculine, in the sense of being based in part around bullying and sexual jokes. Interestingly, for some people, this masculine atmosphere is perceived as gentler and more welcoming when

[207] There are so few female professional cycle mechanics in both Lyon and Melbourne that I ended up interviewing every single one of them. Based on observation, it is likely that women constitute less than 10% of all professional cycle mechanics.

compared with car culture. For example, Richard found that becoming a cyclist allowed him to escape from the violent bullying perpetrated by the boys with whom he used to socialise while practicing car repair:

> *I grew up being mercilessly bullied… We had to be a man, and the boys around me, I was the one they practiced being a man on. I grew up being severely alienated from traditional masculinity, and especially from motor vehicles. We are all being taught to identify driving a car with masculinity, and the whole thing really repelled me. Therefore, a bicycle is my way of getting around without a car.*
>
> Richard, cyclist, Melbourne

Despite this perception, in many cases, male cycle mechanics bond around representations of female nudity and sexuality, creating an atmosphere that is not especially welcoming to women. Lisa, who created an association that teaches and supports female road cyclists in Melbourne, recounts an example of this:

> *I walked into the mechanics' area, and there were porn calendars on the workshop wall! […] In the end I went, took it down, I put it in the bin, and I said: "You wanna have women customers in here, you cannot have that calendar." Next day, back up. And they were all laughing, saying, "Lisa doesn't like the titties."*
>
> Lisa, cyclist, Melbourne

Anne Monjaret has studied the practice of displaying "naked calendars" (calendars containing images of nude or provocatively dressed women) in masculine spaces (Monjaret 2020). This practice derives from the display of pin-ups to cheer up soldiers during the First World War. This display of male desire was instrumental in creating masculine solidarity and a shared culture between manual workers, as well as being a distraction from their often rough working conditions (Monjaret 2020).

As Monjaret documents, the practice of displaying naked calendars has declined in the 21st

century after being widespread for decades. Although this means that Lisa's experience is becoming less common, the work environment in repair spaces is still often a place in which masculine complicity is constructed. This masculine complicity is often based on men treating each other roughly. For instance, in the Facebook group "The funny side to bike mechanics", male mechanics share stories of "the best thing they ever did to the new guy". These stories include those of shop owners telling their employees that the earth is flat, or that a colleague of theirs is autistic, pretending that chain lube has to be shaken every two hours for it to work properly, making them count the threads of brake cables, etc. These examples of shop owners taking advantage of the gullibility of their newest employees under the pretence of "integration" and "banter" reveals the widespread existence of a "workshop culture", the masculinity of which is constructed and expressed through aggressive jokes and insults that the recipient is essentially required to interpret as friendly; ultimately, this is a culture in which women are less likely to feel comfortable.

Inappropriate Attention

Another patriarchal mechanism of exclusion is inappropriate attention. Women often experience inappropriate attention in cycle repair and maintenance spaces. Here, the term "inappropriate attention" is intended to encompass many different expressions of sexism and sexual interest towards women, which include unrequested assistance with tasks, unsolicited advice, and unwanted flirting. Although this behaviour does not always qualify as sexual harassment, it does always encroach upon women's private space and initiative while making them feel objectified and deprived of their own subjectivity and autonomy. It also contributes to the expectation that they be available to male desire.

One example of inappropriate attention can be observed in community workshops, where the interaction between volunteers and visitors is less formal than in cycle shops. One common occurrence involves male volunteers showing an excessive interest in helping women, sometimes without being requested to do so. Although this might seem harmless, and women do not always complain about it, it also contributes to constituting spaces of repair as spaces in

which women's subjectivity is denied. As Pauline, a professional mechanic, describes it:

> *The last time I set foot in a community workshop [...] I believe that at least six to eight guys came to me during the evening to suggest that I go home with them. [...] Seriously, it was the theme of the evening! Where I'd be sleeping that night!*
>
> Pauline, mechanic, Lyon

This frequent inappropriate attention contributes to gendering space, making the lived experience of being in these spaces different for men and women (Massey 1994). When men regularly encroach upon women's personal space, it contributes to making the activities of repair and maintenance feel intimidating or challenging to women.

Denial of Expertise

A third characteristic of cycle shops and community workshops as a patriarchal context for repair and maintenance is the denial of expertise encountered by women engaging in repair and maintenance practices. When walking into a cycle shop or a community workshop, women often feel that the employees or volunteers are making assumptions regarding their repair and maintenance skills. Often, women see their expertise denied at the same time as they experience inappropriate male attention. One example often discussed in the context of community workshops concerns male volunteers who, when a woman asks them for help with a repair, will take the tools she was using and perform the repair themselves. This, for instance, happened to Olivia:

> *Often I had male volunteers coming over and like giving me comments like, "for a woman, that's a nice bike you have, why do you have it, do you even appreciate that you have a nice bike, do you even know anything about it?", you know. Or like, "wow, you know a lot for a woman, you know how to... do things", like they're surprised. Or when I ask questions, they come in and start doing it for me rather than explaining, and I really have to be quite pushy and be like, take the tool off them and be like "cool, so*

yeah I think I've got it now, I can do it", or just stop them and be like, "hey, can you explain it to me?", like "can you use your words, not just come in and do it for me?".

Olivia, cyclist, Melbourne

Amanda, an experienced road cyclist and cycling coach in Melbourne, said she once walked out of a cycle shop after an employee assumed that she wanted a flat bar cycle. Since such cycles are not used for racing, this was ultimately an assumption that, as a middle-aged woman, she could not race, which deeply offended her.

The denial of women's expertise is most blatant in the case of female professional mechanics. Even after years of experience, these women frequently encounter customers who do not trust their skills. Juliette, a qualified e-cycle mechanic in Lyon, experiences this frequently. She recounts daily interactions where customers do not take her seriously:

Some guy comes into the shop to ask a technical question, he will see me but not go and ask me directly, even though I am standing at the workshop next to the sign saying "workshop". And he goes and asks my colleague instead. This happens to me every day.

Juliette, mechanic, Lyon

Visible signs of their status, such as the physical position they occupy in the cycle shop – in the workshop area, with tools in hand – often do not suffice for customers to treat female mechanics as skilled. All qualified female mechanic respondents relayed similar stories of customers not talking to them directly and ignoring obvious signs that they were in charge for a specific repair. According to Juliette, customers sometimes refuse to believe that she was the staff member who completed a successful repair. In some extreme cases, customers have even refused to accept that a woman was in charge of repairing their cycle or, while on the phone, requested to talk to a male mechanic. It is thus both customers and sometimes colleagues of

female mechanics who frequently deny their expertise. This denial of women's expertise often derives from the strong association between masculinity and specific areas of employment (Cockburn 1991); similar observations have been made in the study of other manual trades (Smith 2013a). Once again, such behaviour contributes to denying women's autonomy and skills, making spaces of repair and maintenance unwelcoming to them.

Cycle repair and maintenance spaces thus constitute patriarchal environments. Indeed, these spaces are not only overwhelmingly masculine, but also allow this masculinity to reproduce itself through frequent inappropriate male attention and denial of female expertise. To follow Young, they are spaces in which women are denied their subjectivity and autonomy. The next section dwells on the ways in which this patriarchal environment inhibits the engagement of women with cycle repair and maintenance, and accordingly, their velonomy.

2.c. The Production of Feminine Velonomy

The patriarchal environment in which repair and maintenance practices take place has been discussed at length above. Young's argument is that women's bodily experience is transformed by the patriarchal society in which they live their everyday lives. In other words, the sexism that is widespread in society more generally – as well as repair and maintenance spaces specifically –not only affects women in terms of the opportunities that are presented to them, but also transforms "the modalities of feminine bodily existence" (Young, 1980:30), here understood as the ways women feel and move their bodies. The patriarchal environment described above is not only the background against which feminine velonomy occurs, but is also what produces the conditions for a feminine velonomy characterised by inhibition regarding repairing and maintaining cycles.

This section follows the outline of the previous one: I examine each of the three characteristics of the patriarchal environment discussed earlier to determine the ways in which it transforms feminine velonomy. Feminine velonomy appears as a condition of inhibition, discomfort, and lack of confidence that is detrimental to engagement with cycle repair and maintenance, as well as the acquisition of new skills.

Masculinity of Repair and Feminine Velonomy

Earlier, I discussed the overwhelmingly masculine character of cycle repair environments. Women often have less experience with cycle repair than men, and moreover rarely meet other women who are experienced with it, let alone professional female mechanics. As a result, women often feel that cycle repair is "not something that applies to them" and lack self-confidence when engaging with it.

Thus, the first effect of the masculinity associated with repair environments is the feeling that repair is "not for them" (women). One woman I met in Lyon had never engaged with cycle repair; she had never even inflated her own tyres, something she left to her husband. She was, on the other hand, very involved with a range of DIY projects, such as fabricating pieces of furniture for her home and for her child. When circumstances prompted her to replace a brake cable, a task her husband suggested they could do together, she was surprised to find it extremely easy. In this case, it is possible to think that the association of cycle repair with masculinity played a role in this woman never imagining that she could inflate her own tyres or replace her own cable. Despite considering herself "very crafty", she did not envision cycle repair and maintenance as a sphere in which she could use this "craft".

Further examples of women thinking of repair as "not for them" can be observed in the many female respondents who expressed worry at the idea of walking into a cycle shop. For instance, Ellie confessed feeling uncomfortable because of the outfit she was wearing at the time: "I remember it feeling weird that I was walking into their shop, in a dress, without a bike." This expressed discomfort illustrates how the masculinity of cycling and of repair can overlap, making women feeling doubly unwelcome in cycle shops.

A second effect of the assumed masculinity of repair and maintenance is women lacking self-confidence when engaging with repair. Many women expressed worry, or even fear, that they would do something wrong when repairing their cycle. One of these women, Susan, describes how this fear of doing something wrong made the repair difficult and unpleasant:

> *The time that I did change the flat tyre, it took me over an hour, because – you know the expression "like riding a bike"? This wasn't like riding a bike. It all felt strange, and it*

felt scary, because if I did something wrong it would be really, really inconvenient for me.

Susan, cyclist, Melbourne

Consequently, Susan did not engage further in repair after these experiences. Other women exhibited similar attitudes to repair, stating that their cycle, as their main mode of transportation, was too important to experiment with. In fact, the cycle's centrality in their life justified extra caution and represented a reason not to attempt to repair it by themselves. Throughout the many interviews conducted, no man expressed such a position regarding repair.

These examples show how the fear of failing can inhibit action, as argued by Young with reference to the concept of feminine motility. This lack of confidence is not only an issue of discomfort, but also an impediment to learning. Indeed, repair and maintenance skills are often learned by doing (Barber 2003); being willing to try and repair something is often the main step in repairing it, and this requires some self-confidence in one's ability to succeed. Women are around half as likely as men to try and repair something unfamiliar (Figure 5.9).

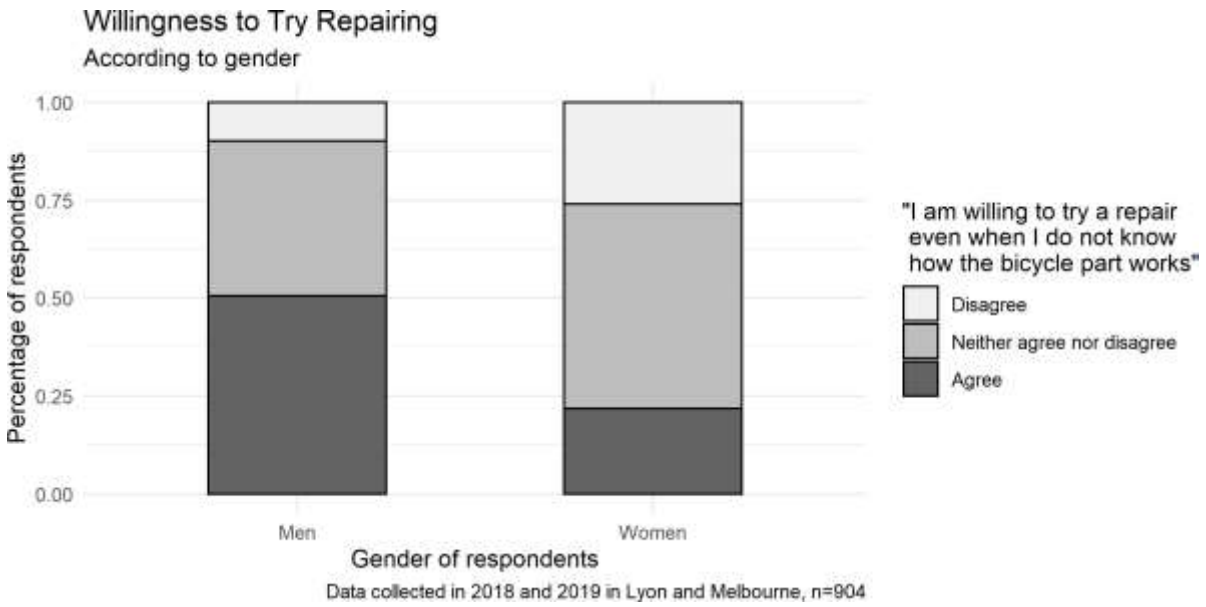


Figure 5.9 - Willingness to try repairing according to the gender of respondents

The masculinity of repair and maintenance thus constitutes a major impediment to feminine velonomy. Indeed, women sometimes feel uncomfortable in repair spaces; moreover, they sometimes lack self-confidence when engaging with cycle repair. This inhibits women's ease with cycle repair in particular, and with acquiring new repair and maintenance skills more generally.

Inappropriate Male Attention and Feminine Velonomy

A second characteristic of the patriarchal environment of cycle repair is the frequent inappropriate attention experienced by women. Experiences of inappropriate attention affect feminine velonomy and inhibit women from engaging with cycle repair and maintenance. These experiences make women feel as though they do not have the same status as men in cycle repair and maintenance spaces, which limits the ease with which they engage with repair. Inappropriate attention also makes women feel that their role in a workshop is to be an object of male desire rather than an actor achieving their own aims.

When given unrequested advice and help, women often feel uncomfortable and disempowered. Sexist remarks and harassment are often cited as reasons why women stop going to the cycle shop or community workshop where they experienced these behaviours. Several women interviewed mentioned a sexist atmosphere as a reason why they did not return to a particular community workshop or cycle shop. When they opt to remain in the spaces in which they experienced this inappropriate attention, it can be detrimental to the quality of their work. One mechanic described the consequences that the commonplace sexist remarks in a previous work environment had on her self-worth:

> *As a result, I lost all self-confidence, so I wasn't repairing bikes like I should, I wasn't doing a good job any more… actually, it did a lot of harm to me.*
>
> Karine, mechanic, Melbourne

Inappropriate attention can also affect women's ability to learn new skills. Jeanne, in recounting

her early years being a member of a community workshop in Lyon, expressed it as follows:

> *I felt like… flirting was kind of mandatory and everyone seemed okay with it. I don't remember feeling very happy with my repairs there – I couldn't even tell you what I repaired.*
>
> Jeanne, mechanic, Lyon

Being on the receiving end of inappropriate attention in the workshop was powerful enough to limit the benefits Jeanne obtained from volunteering there. This hostile environment obscured her memories of the time she spent there, and it is likely that this discomfort was an impediment to her developing new repair skills.

In short, inappropriate attention contributes to restricting feminine velonomy by limiting the ease that women feel in relation to maintenance and repair spaces and reducing their opportunities to learn and acquire new skills.

Denial of Expertise and Feminine Velonomy

The last patriarchal aspect of repair and maintenance spaces is the denial of women's expertise in cycle repair, even when their peers consider them experts. This general atmosphere inhibits feminine velonomy by feeding women's low self-confidence. It is also an impediment to learning and improving technical skills.

One illustrative example is the case of Rosa. As an apprentice in a cycle shop, she is not yet very experienced, but she also feels very exposed as the only woman in her environment, since, in her view, she will reinforce stereotypes about women and mechanical work if she fails at her job. She has internalised this pressure, which she describes as an obstacle that prevents her from enjoying her job and getting better at it:

> *I don't… I have some skills, but I'm really learning on the job. And I wanna learn to kind of show people that women can do it, but the reality is that… I can't [laughs]. So that's a challenge.*

Rosa, mechanic, Melbourne

Like all other female cycle mechanics interviewed in the present research, Rosa regularly sees her expertise denied, which makes her feel constant pressure to prove her worth. In the following example, she describes the way in which pressure exerted by a customer affected her ability to demonstrate her technical proficiency unhindered:

> *I was the unfortunate person who had to build this tiny kid's bike with tiny wheels, which is not a complex build, but it's really fiddly and annoying… after 20 minutes he came and just stood next to me, watching me as I did it, which – I cope terribly with this kind of stress… So, [he was] half telling me what to do and half watching me. The first thing he said was "What qualifications do you have, and what experience do you have?"*
>
> Rosa, mechanic, Melbourne

As Rosa's account illustrates, the regular denial of women's expertise impacts not only the way they feel, but also their bodily movements. What she describes as a simple task became an arduous chore due to the angry customer watching her closely and commenting on her work. The pressure that Rosa describes was not only psychological, but also transformed her bodily engagement with the cycle on which she was working; it reduced her ease and was detrimental to the quality of her work. Once again, the denial of female expertise that regularly occurs in repair spaces restricts feminine velonomy; it makes these spaces uncomfortable for women and limits their ability to engage with, and learn about, cycle repair and maintenance.

The patriarchal context of repair and maintenance produces the conditions for feminine velonomy, namely for women to feel inhibited and less confident with cycle repair. Making them feel uncomfortable in certain repair and maintenance spaces also contributes to their exclusion from these spaces. Furthermore, it limits the opportunities available to women to experiment with cycle repair and maintenance, and thus to acquire new skills.

2.d. Gendered Repair within the Household

As in the case of cycling, the gendered dynamics underlying repair and maintenance practices are informed by social dynamics occurring within households.

Fathers and Repair

The first social dynamic of interest is the one between parents and children. Most cyclists interviewed for this research mentioned their father as a person who served as a reference for repair and maintenance in their environment during childhood. Previous studies have shown that fathers are often in charge of socialising their children around sports activities, while mothers are in charge of cultural activities (Mennesson 2011). However, when it comes to sports (Mennesson 2011) or cultural activities (Octobre 2005), fathers are often more engaged with the activities of their sons, while mothers are more engaged with their daughters; notably, this is not the case with cycle repair, as none of the cyclists interviewed made mention of their mother or any other female figure as a referent for repair practices.

Fathers are often the person in charge of cycle repair and maintenance in a household. They are also the person who sometimes teaches their children cycle repair. However, in some instances, by taking care of repair tasks, they unfortunately reinforce the dependency of their daughters on their skills:

> *A while ago I got a bike. I remember, when I would get a puncture, I would bring my tyre back to my dad so that he could patch it.*[208]
>
> Marlène, cyclist, Lyon

In other cases, fathers attempt to teach repair and maintenance to their children. Sometimes, they encourage them to become completely autonomous with tools by putting some responsibility into their hands:

---

[208] « Il y a très longtemps j'avais pris un vélo, je me souviens, quand je crevais je ramenais mon pneu à mon père pour qu'il mette la rustine. »

I'm the oldest child and I lived on a farm, helping dad. One day I walked upstairs, and dad was soldering a tank. I asked him what he was doing, and he said, "that's a soldering iron – come over here, get the iron, you're going to do some too". One day I was doing Girl Guides and we needed a new box. So I said, "my dad can do it, he's very good with his hands!". I came home but dad said, "no, I won't do it. But you'll do it, and I can help you". And we did! We made a wooden box, we routed the handles on it, we used the chisels and did the finishing on the joints… we got a new box. But I had to make it myself.

Amanda, cyclist, Melbourne

Amanda's example is however not very common among the cyclists, and more specifically female cyclists, interviewed in the present research. In most cases, fathers were described as playing an educational role, although this was not undertaken in a continuous or intensive way that would enable their daughter to become velonomous. For example, Chloé relates the following experience:

When I was little, my father was the one who'd fix bikes. When he did some repairs, he called us and said, "come have a look" – especially when it was about our bike, he'd say "look", but it's also true that he was mostly doing it all himself. I think that's because he wanted it to be done correctly.[209]

Chloé, cyclist, Lyon

Fathers thus sometimes teach their daughters some basic maintenance operations, which can form the basis for further learning when they later leave the household. It is however rare for this familial teaching to go beyond this first stage. Overall, the fact that fathers are usually the

[209] « Quand j'étais petite, c'était mon père qui réparait les vélos. Quand il réparait il nous appelait et nous disait « viens voir » , surtout quand ça concernait notre vélo, il nous disait « regarde » , mais c'est vrai qu'il le faisait plutôt lui-même, je pense que c'est parce qu'il avait envie que ce soit bien fait. »

ones to take care of cycle repair and manual work strengthens the association between cycle repair expertise and masculinity.

Heterosexual Relationships and Repair

In addition to this father–child relationship and its association with repair, heterosexual relationships are also places in which repair practices are unevenly shared and largely taken charge of by men. This is for instance the case with Marie, who cycles every day but relies on her husband to inflate her cycle tyres:

> *Uhm… no, I usually know that he has inflated the tyres because I see him do it. I'd already asked him to do it because the tyre was really flat, and he showed me so that I would know how to do it. But it didn't happen again, because every other time he'd be the one to pump up the tyres on every bike. I know it's him because he goes downstairs with the bike pump just before we all go out riding together. […] And yet, he's less handy than I am!*[210]
>
> Marie, cyclist, Lyon

Marie acknowledges that the fact that her husband inflates her tyres prevents her from learning how to do it herself, even though she did once attempt it. Although she considers him to be "less handy" than she is, it is still agreed upon within their relationship that he is in charge of this maintenance task.

Of course, this uneven share of repair does not happen in every household. For instance, Daniel considers that it is not his duty to repair his wife's cycle, since "she's an adult, she can take care of it herself." Despite this, among the two of them, he is still the one who takes care of their 14-year-old son's cycle.

---

[210] « Euh… non je le vois faire, ça m'est arrivé de moi lui demander parce que c'était vraiment à plat, il m'a montré pour que je sache faire, mais ça s'est pas représenté parce que la fois suivante c'est lui qui a regonflé tous les vélos. Je le sais parce qu'il est descendu avec la pompe à vélo juste avant qu'on sorte tous ensemble à vélo. […] Pourtant, lui est moins manuel que moi ! »

Repair practices are thus gendered in many ways. In line with the strong association between technical and manual work and masculinity, patriarchal spaces of repair contribute to the exclusion of women from these activities. This gendered organisation of repair practices echoes the pre-existing family and household structures, which also in turn reinforce the prominent role of men regarding mechanical tasks. However, some personal and collective initiatives have attempted to challenge these gendered velonomies.

3. Reappropriating One's Cycle

As discussed above, women's relationship with the cycle is transformed by the patriarchal environment in which repair and maintenance practices take place. However, they are also actors working to transform this environment and offer some resistance to these restricted schemes of gendered velonomies. The gender norms that structure and transform velonomy can be challenged at several levels.

Danielle Kergoat argued that women entering male-dominated workplaces in the 90s initiated other styles of lives than the majority of women in the previous decades, engaged in part-time, precarious, ill-paid positions (Kergoat 2000). Guillaume Malochet furthers this idea by suggesting that the profile of women working in fields dominated by men can call the unity of female experiences into question, and bring some nuance to the study of gender and work (Malochet 2007). In regard to the social construction of the feminine experience, which I discussed in the two first sections of this chapter as characterised by domestic mobility work and inhibited cycling and repair practices, it could be argued that women who engage with cycling and repair question and contest parts of the feminine identity that is socially assigned to them. As observed in the case of women in very masculine sports (Mennesson 2004; Joncheray, Level, and Richard 2016) and very masculine occupations (Cassell and Le Doaré 2000), women are often required to balance the masculine attitude and skills expected in this environment and the feminine attitude that they have been socialised to adopt and are expected to display. This conflictual relationship can be the source of a powerful questioning of both the expected femininity of women and the masculinity of repair practices.

3.a. Gender Power Relations as a Script

One important focus of feminist theory and research is sexual assault and the way it is embedded in social processes (Dorlin 2017). One way to consider this violence is as a "script". Indeed, the way women are socialised encourages them to be passive when faced with aggression: this script of violence is what they expect to encounter (S. Jackson 1978; Millepied 2018), and this expectation shapes both women's and men's behaviour in many instances, such

as in the street (Fox, Nobles, and Piquero 2009), in the case of college students flirting (Baldwin-White 2021) and on dating apps (Thompson 2018)[211]. Although the consequences of these actions are less dramatic, it is possible to consider manual work – and, more specifically, the relationship of women to cycle repair and maintenance – as a script too: women are expected to be passive, to receive the repair, whereas men are expected to perform it for them. This passivity can be linked to the "feminine doubt" highlighted by feminist phenomenology scholars (Casselot 2018). The fact that women often depend on their male friends or relatives for the use or maintenance of their own cycle can be considered as belonging to this script of gendered repair. However, if female bodies engage in these scripts, they can also transform them, as argued by Elizabeth Grosz:

> If bodies are traversed and infiltrated by knowledges, meanings, and power, they can also, under some circumstances, become sites of struggle and resistance, actively inscribing themselves on social practices. (Grosz [1993] 2013: 199).

Like women who transform what is expected of them through the learning of self-defence (Millepied 2018[212]), in the realm of cycle repair and maintenance, women can transform a script of passivity to one of power and autonomy. This transformation can take many shapes; it can occur at an individual or a collective level.

3.b. Individually: Transforming One's Relationship with the Cycle

Women often adopt certain individual attitudes and strategies to deal with the contradictory expectations with which they are faced.

[211] Although men can also be victims of sexual assault (most of the time initiated by other men), there is no "sexual script" of men as victims, something that can undermine even the academic and social recognition of the harm that they have experienced (Depraetere et al. 2020)
[212] I would like to thank Aurélie Aromatario for pointing out this work to me.

Pride and Empowerment

The first form taken by this individual transformation of the script is the pride felt by women who perform certain repairs despite not being expected to do so. In the course of my fieldwork, I encountered many women who relayed the strong sense of pride they felt when realising they were able to perform even the smallest repair. For example, Susan struggled a lot with repair and continues to feel very insecure about it, but also has an extremely strong memory of the one time she repaired a puncture:

> *It was really exciting that I did it, and it did actually work, it stayed for ages, it didn't, like – it's not like I pinched it or anything like that, it was a good fix, it stayed for ages. It was a really proud moment, and I was really pleased that it was actually done properly.*
>
> Susan, cyclist, Melbourne

For many women, this pride – the feeling of being able to do something that until recently felt like it was inaccessible – is something that drives them to acquire even more skills. For instance, Marlène was initially considering bringing her cycle to a shop for future repairs, but after telling me about how she had repaired it herself in the past, the pride she experienced made her change her mind:

> *Frankly, I was just telling you earlier that I would bring my bike in for repairs, but now, as I'm talking to you about it, I'm thinking that I actually feel so much pride when I say to myself "I am the one who fixed it and I know how to do it" that I will go on doing it myself at the community workshop.*[213]
>
> Marlène, cyclist, Lyon

[213] « Mais franchement, j'te disais tout à l'heure, je ramènerais mon vélo à faire réparer mais en t'en parlant je me dis en fait, j'ai tellement une fierté de me dire "c'est moi qui l'ai réparé et je sais faire" que je continuerai à le réparer moi à l'atelier. »

No man interviewed ever expressed this sort of pride when describing a repair. The same resistance that encourages women not to attempt repair thus becomes a strength when they overcome it and try it anyway. The feeling that they have resisted the passive attitude towards repair expected of them can be a great joy for female repairers.

Adapting to a Masculine Repair Culture

Women who engage in cycle repair and maintenance sometimes find themselves in conflict with the social expectations placed on them. This is the sentiment expressed by Joyce, who felt that one way to feel legitimate as a female cyclist who is able to maintain her cycle was to carry gloves in order to keep her hands clean at all times:

> *I always carry something to clean. This is quite funny – it's very sexist, but someone told me a lady should always carry a pair of white gloves. When you wanna do your chain, you don't wanna get dirty. This is my second pair – I've used them, actually. In fact, I've stopped to help someone with their chain.*
>
> Joyce, cyclist, Melbourne

The conciliation between engaging in repair and femininity may manifest in different ways. For Karine, as for several female mechanics I discussed with, being perceived as having feminine qualities is something that does not feel entirely right, but that she sometimes takes advantage of:

> *For sure, I'll sell a bike more easily, because, well, I'm a woman and I speak French and that's exotic, and all of that does help with sales. But, well, I don't care – it's good for my work, so, well. So, is it sexist? I don't know. I don't actually care, it's not that important.*[214]

[214] « C'est sûr que je vends plus facilement un vélo parce que bah t'es une femme et que tu parles français et que du coup c'est exotique et tout ça, ça vend. Mais voilà je m'en fous, ça se passe bien au boulot, alors voilà. Du coup est-ce que ça c'est sexiste, moi je sais pas. Je crois que je m'en fous quoi, c'est pas très grave. »

Karine, mechanic, Melbourne

By choosing this attitude, Karine differs from two other female mechanic interviewees, who expressed discontentment at being asked to work in the sales area of a cycle shop despite having been hired as mechanics. These two other women left their jobs for this reason, and one of them even stopped working as a mechanic after this event. Karine's different experience may be related to her higher status and the healthy work culture in which she finds herself, which makes her feel valued despite this gendered treatment.

Both Joyce and Karine are trying to adapt the social script, according to which women are not good mechanics, to their own repair and maintenance practices. For Joyce, keeping her hands clean at all costs allows her to preserve her idea of her femininity within repair practices. Karine is aware that some of the way she is treated may be related to stereotypes regarding women, but since it allows her to have good working conditions, she considers it to be a fair price to pay. In addition to these strategies of adaptation, fieldwork among professional mechanics revealed other strategies developed by respondents to resist masculine culture and to assert their legitimacy as women in the field of repair and maintenance.

The Struggle for Legitimacy: Strategies of Feminine Velonomy

One important aspect of the patriarchal environment of repair and maintenance mentioned above is the frequent denial of women's expertise. In some cases, women develop individual strategies in order to assert their legitimacy and counter these sexist stereotypes, thus transforming the script of passivity assigned to them. In this section, I focus on three of these strategies: practising to perfection, didactic demonstration, and selective interactions.

The first way in which some women deal with the frequent lack of recognition of their skills is practising to perfection: that is, developing their skills to such a high level that it is impossible for others to doubt they are qualified. This is for instance the case for Sam, a Melbourne shop

owner who prides herself on being the person people go to for complicated operations, frame-building, and "when stuff gets stuck":

> *They go, "I heard good things about you… oh, you're female!" So it works for the positive as well.*
>
> Sam, mechanic and shop owner, Melbourne

While, for Sam, being known as an expert may not have been a strategy intentionally employed to combat the sexism she encounters during everyday interactions, other respondents adopted a different approach. Employed as a mechanic in very high-level competitive races, Clarisse recounted how she had practiced replacing a broken cycle chain for hours at a time while at home, until she could eventually complete the task in 34 seconds. She described this impressive performance as allowing her to gain respect as a serious mechanic in a place where she, as a person who appears "blonde and girly", initially did not feel trusted. "The fact that I was working for a very good athlete also helped a lot", she added.

Didactic demonstration was another strategy adopted by women skilled in cycle repair and maintenance. Indeed, demonstrating skills, whether in practice or verbally, is a way that female mechanics can assert their legitimacy when facing customer distrust. This is the strategy adopted by Juliette, a mechanic who recounted her pleasure in contradicting customers who think they know more than she does, while still remaining polite since her employment is at stake. This is also the attitude favoured by some female cyclists when visiting a cycle shop as a customer, as illustrated by Louise, an experienced road cyclist:

> *I wait until the person explains everything to me in detail. […] He explains everything, I let him talk, but I'll drop a couple of details into the conversation that show that, "Oh, well, actually she knows what she's doing" […] and this way, they are more impressed by a striking little detail. […] Several women told me that they do exactly the same.*
>
> Louise, cyclist, Lyon

Finally, another potential strategy is selective interactions. For instance, some female cyclists admitted to preferentially visiting cycle shops where the staff knows them and their competences. This is the case with Amanda, previously described as feeling extremely offended by an interaction in a cycle shop. Amanda explained that this hurtful experience convinced her to only visit shops where she is well-known, such as the one that sponsors her cycling club.

Another form that this strategy can take is the one adopted by Olivia. This respondent explained that, while in a cycle shop or a workshop, she often behaves very coldly in order to limit the expectations that people may have when engaging with her; she refers to this behaviour as "putting a hard shell on":

> *I feel I have to put on this really – confident, kind of, and strong, almost rude energy about me when I walk into a bike shop and I ask questions, or like I'm buying things. Because [...] it's already thought that women don't know anything, so you can just do anything you like.*
>
> Olivia, cyclist, Melbourne

Women develop diverse strategies for transforming the scripts assigned to them. These individual strategies are ways to exert agency and resist the patriarchal environment in which they are immersed. However, gendered social scripts cannot be reversed through individual actions alone: indeed, these strategies of resistance are made easier in less patriarchal environments. This is for this reason that many collective feminist initiatives have emerged related to cycling and repair.

3.c. Collectively: Feminist Initiatives and Collective Velonomy

Transforming the script of feminine passivity can also be done collectively. The environment in which women engage with repair can also be inhabited by other men or women who contribute

to the safe development of their velonomy.

Male Allies and Female Legitimacy

Female mechanics sometimes receive assistance from their male colleagues in situations where customers challenge their legitimacy. For instance, Rosa, a mechanic in training whom I quoted earlier, mentioned how helpful she found one of her male colleagues, who made a point of always introducing her to new customers as "Rosa, our mechanic". Other female mechanics praised the support provided to them by male colleagues who intervened when a customer behaved inappropriately, or in other situations of direct conflict:

> *I took my manager to the side, and I told him, "listen, this customer is very difficult and I don't think that it's related to cycling or to the shop, I think that it is about us, women". Then the manager went to see him and told him, "we don't need this type of behaviour here, you can go elsewhere", and he gave him the opening times of other shops… it was a bit stressful, but it went well in the end.*[215]
>
> Karine, mechanic, Melbourne

Another example of this strategy of relying on male peers can be observed when female cyclists ask a male friend to come with them to a cycle shop to improve the chances that they are taken seriously. Overall, it is a common collective strategy to have men support the legitimacy of a woman. This strategy is however unsatisfactory, since it relies on men possessing power and authority in the space where the repair occurs.

---

[215] « J'ai pris mon manager à part et je lui ai dit « écoute, ce client est très difficile et je ne pense pas que ce soit par rapport au vélo ou au magasin, je pense que c'est par rapport à nous, les femmes » . Là notre manager est allé le voir et il lui a dit « On n'a pas besoin de ce genre de comportements ici, tu peux aller ailleurs » et il a donné les horaires d'ouverture des autres magasins… c'était un peu tendu mais ça s'est bien fini quoi. »

Sorority and Female Mentorship

Most women who feel very confident in repair spaces mentioned some solidarity with other women, sometimes in the context of mentorship. Women in spaces where other women are rare tend to notice each other; as the following story illustrates, one respondent once accidentally injured herself because she was so excited to be following another woman who could ride fast:

> *It's so busy, you get all the bloody blokes, [they're] aggressive, it's annoying, there are so many people. I'm a fairly strong cyclist, and blokes overtake me, but not many women overtake me. This woman was like, flying, and I thought "wow, you're amazing!". So then we get stopped at lights, and I'm like, "yeah, I'm going with you sister, let's overtake these bastards". But then I realised too late that she was actually turning right off the path. I clipped her wheel, and I ended up spread out on the bike path. Everyone stopped – they had to, they would have run over me if they didn't stop. It was awful, and I was in a lot of pain.*
>
> Julia, cyclist, Melbourne

Similar to the feeling of pride mentioned above, sorority – or the joy of working together with other women who face similar difficulties in a patriarchal environment, even when these women are strangers – can be a feeling that drives women and motivates them to become more involved in these spaces. In some cases, it is even the trigger for women to start learning repair and maintenance:

> *I attended this training, and it was a true revelation, too – well, really, I admired these women who made accessible things that we never thought would be accessible. Even the tools, I mean, we see them from afar… we don't dare to pick them up, we don't know… and suddenly Jeanne takes them, shows them to us, explains what they're for in simple words. And I could completely relate to that, [I started] to think "yeah, it's possible, why shouldn't I do some repairing too?" I wasn't giving myself the permission to do it before. It was seeing Jeanne and Myriam repair bikes that made me think, "I*

want to do that too!" [laughs] "It's actually possible!"[216]

Lucie, mechanic, Lyon

These mentor figures are extremely important within repair spaces; moreover, they are often aware of this importance, as many women involved in repair and maintenance are also involved in supporting other women through teaching them or encouraging them in other ways.

Collective Feminist Organisations

As awareness of these issues is growing, another collective approach adopted by women to resist a patriarchal environment is the creation of women-only spaces, or spaces open to women, as well as to transgender men and non-binary people. Like many cycling activist organisations (Batterbury 2003), in France, these feminist organisations are structured nationally and thus constitute a wide and dynamic network. These groups offer collective alternatives to male-dominated spaces when it comes to acquiring repair and maintenance skills and engaging safely with repair and maintenance[217]:

> *When I went to Georgie's course, yeah, that was terrific, it was cool to have a female running it. I've got brothers, I've been around more guys than anything. So I'm not uncomfortable myself. But sometimes, even with their language, they know a lot more, and they presume a lot more. Georgie brought that down to our level, she made us feel comfortable, I certainly felt more confident after I did [the course].*

Joyce, cyclist, Melbourne

---

[216] « J'ai participé à cette formation et ça a été une vraie révélation, vraiment j'étais admirative de ces femmes qui nous rendaient accessible des choses qu'on pensait pas accessible. Ne serait-ce que les outils en fait, on les voit comme ça de loin… on n'ose pas prendre, on ne sait pas… et du coup là, Jeanne à bras le corps, qui nous présente tous les outils, à quoi ça sert, avec des mots simples et moi ça me parle énormément pour me dire "ouais c'est possible, pourquoi pas moi aussi faire de la mécanique" / On s'autorise pas en fait, je m'autorisais pas. C'est d'avoir vu Jeanne et Myriam qui faisaient de la mécanique, j'ai pensé "moi aussi j'ai envie de faire !" [rit] "En fait c'est possible !" »

[217] See for instance the documentary "Le moment des forces" by Constance Brosse, 2018, about a cycle repair and maintenance class for women and non-binary people in Lyon.

In Melbourne, at the time of this fieldwork, the feminist cycle repair initiative Wrenchworthy had ceased activity after operating from a community centre in the city's northern suburbs between 2015 and 2018. Since then, repair activities for women and gender minorities were quite occasional or one-off: usually repair courses organised by female riding clubs (Wheel Women Melbourne) or equipment brands (Rapha Women). In Lyon, the repair session Heures Félines, aimed at women, non-binary, and transgender people, started around the same time as Wrenchworthy and is still active, operating for a few hours every fortnight. Unlike Wrenchworthy, this initiative was started from inside the biggest self-repair workshop in Lyon, the Chat Perché, and could accordingly benefit from the tools available, as well as from the workshop's broad popularity in Lyon. This may have contributed to this initiative's ability to continue over time. In both cases, this is not the first feminist initiative in the area to be centred around repair; in Lyon, for example, such sessions already existed in the 1990s.

In addition to repair sessions, feminist organisations have also set up diverse cycling events aimed at women. These grassroot events redefine the city in a way that runs parallel to the more formal and institutional processes that aim to encourage cycling practices (Gallez et al. 2015). Cycling events for women can be more or less radical, ranging from the Fancy Women Bike Ride to Rapha's Women 100 and feminist "vélorutions" (Figure 5.10).

The first type of event aims to celebrate women and to encourage them to cycle in more diverse outfits. The Rapha Women's 100 is a non-competitive sports event with the goal of encouraging women to get started with road riding. On the other hand, feminist vélorutions are events with a political message that are affiliated with punk culture, as illustrated by the frequent use of tall bikes. These rides follow the legacy of the Critical Mass movement, a cycling protest method originating from South America (Furness 2010; Gillot and Rérat 2022), during which "an alternative sustainable society is being, however temporarily, brought into existence" (Horton 2006).

Figure 5.10 – Feminist ride in Lyon, September 2020 (Credit: Valérie Rochet)

Moving beyond ideas of environmental sustainability, the Critical Mass approach is here used for feminist aims: instead of (or, rather, in addition to) advocating for safer cycling within the city, feminist cycling activists also advocate for a safer and more inclusive environment for women within cycling communities. These public rides rely on the idea that women occupying public space and engaging in a physical practice usually favoured by men changes the public associations between women and cycling. Feminist rides thus contribute to advocating for feminist issues within cycling practices; they are a means of communication with the rest of the city that takes the form of numerous, strong, and independent women, proud and happy, protesting together.

A second role fulfilled by feminist cycling protests is that, like feminist repair sessions, they are a social space in which women can redefine their own perceptions of the urban space and of their own abilities. In feminist workshops and feminist cycling events, women gather and construct new shared meanings of cycling. As Aldred argues, cycling activism causes various

issues and identities to be intertwined (Aldred 2013b). In the case of cycling feminist activism, participants' identities as women, members of gender minorities, and feminists, along with their shared goals (such as the search for safety and for legitimacy in a male-dominated environment), interact to help construct diverse social movements. In doing so, they are representative of new forms of cycling activism, as described by Aldred:

> Critical Mass's organisational form epitomises the radical 'new'; engaged with civil society rather than the state, prioritising being rather than negotiating; transforming the city through practice rather than asking for funding or for bike tracks. (Aldred 2013b: 7)

This recreation of identity and meanings is made possible by the embodied engagement with the cycle: it is not only the idea of the cycle that is transformed, but the sensory experience of cycling or repairing, that shifts from dangerous and scary to freeing and joyful. Indeed, as demonstrated by a study of emotions and meat consumption, changes in practices come with the transformation of emotions and sensations associated with it (Sahakian, Godin, and Courtin 2020).

Case study: Heures Félines – History of a Lyon Feminist Repair Session

The Heures Félines are the only regular repair sessions aimed at women, transgender, and non-binary people in Lyon. At the time of this discussion, the Heures Félines had just celebrated their fifth anniversary. Jeanne, one of the co-founders of the session, explained that when the idea was first brought to the executive board of the community workshop the Chat Perché, it met with little opposition; this was a relief, since the organisers had heard of many situations in other cities when workshops had suddenly cancelled feminist sessions or withdrawn their support from them. "We first thought that it was less relevant to organise a feminist session in a workshop that is already quite feminist. However, when we heard of these stories in other cities, we realised that it was precisely because we could try that we had to do it – because in other places, people were not given this opportunity."

The initial idea behind Heures Félines was a session in which anyone could participate, but that was run by female volunteers only. However, the organisers soon realised that there were too few women with the required level of repair skills to make this feasible; as a result, the project evolved towards skills training for women and the creation of sessions where everyone but cisgender men would be welcome. According to Jeanne, the development of Heures Félines thus contributed to the development of the workshop at many levels: many of the pedagogical tools developed for this feminist session were later integrated into the standard functioning of the workshop, especially when training new volunteers. Furthermore, the session attracted more female volunteers who then became involved at diverse levels in the workshop, including as volunteers in general sessions and in the executive board of the workshop. Jeanne quotes members of another Lyon workshop, adding that at the time, "they were saying that they would think of feminism later, that they had bigger fish to fry for the moment. Now they ask us, 'wow, how come so many women volunteer in your workshop?'. Right – the difference is that we set up a concrete, active process. We didn't just say 'we are against sexism'."

Jeanne considers feminist discussion to be very important for women and transgender-only repair sessions, but she also insists that these sessions are spaces in which practice prevails over theory and must come first. "If attending the Heures Félines opens the door to some feminist thinking, that's great. But this is above all a space to practice repair together, to be together, to do it without the guys, to feel free to try without feeling judged, to fail, to work and experiment. And then we can put some words around how it felt and start analysing our lived experiences."

Transforming Symbols

One way in which collective initiatives transform the script of feminine passivity within cycling practices is by transforming the symbolic associations between women and repair. Many feminist initiatives related to cycle repair and maintenance also involve cultural creations: zines, posters, and songs contribute to the transformation of representations around gender, cycling, and repair.

One example of this was presented by Jeanne, who, together with a feminist group, created a poster called "Mechanical work without strength":

> *Sometimes women were in here, clearly waiting, saying, "where is the strong man who can loosen this nut?". I thought that there was something to deconstruct about the link between mechanical work and strength. We can transmit the elements that allow people to understand that it is your posture and the tools that you use that make a difference, not "I have big biceps" or "I am tall, I am strong" or "I am small, I am frail"... Gravity works for everyone. You don't need to weigh a hundred kilos to loosen a pedal. Thus, "Mechanical work without strength".*[218]

Jeanne, mechanic, Lyon

The posters for feminist events often depict women or non-binary people proudly holding tools. Another way in which feminist representations of cycling and repair circulate is via the medium of singing. For instance, the Chant des clous, a feminist song written in 2019, was shared widely throughout alternative feminist networks related to cycling. This song celebrates women and queer people in bodies that do not fit gender norms (tanned and hairy) riding naked in the French countryside, insulting car drivers in an act of protest against the supremacy of both driving and

[218] « Parfois des femmes étaient là, clairement, à attendre, "il est où l'homme fort pour me tourner ce boulon". Je me suis dit, il y a une déconstruction à faire autour de mécanique et force. On peut transmettre les éléments qui permettent de comprendre que c'est ta posture et les outils que t'utilises qui vont faire la différence et pas j'ai des gros biceps ou je suis grand je suis fort ou je suis petite je suis frêle... au bout d'un moment la gravité, elle vaut pour tout le monde. T'as pas besoin de faire 100 kilos pour desserrer une pédale. D'où "mécanique sans force". »

men:

> *(Chorus) The country, black with summer/ the panniers, the freedom/ with two friends to sing with, I know/ that no moron can hinder us*
>
> *As we insult the automobiles/ while they overtake us, driving too close/ give a finger to the asshole/ whistling at our naked bodies*
>
> *In my tanned, hairy calves/ enough anger and bitterness/ for years of struggles on the pedals/ and years of anti-patriarchal sweat*[219]

Le chant des Clous, 2019

This section has highlighted several movements headed by female cyclists who aim to reappropriate their cycles. Women can transform the script of passivity that is assigned to them in many areas of life, including cycling and cycle repair. This transformation can take the form of an individual feeling of pride or joy, or the elaboration of strategies to assert one's legitimacy in a male-dominated environment. Women may sometimes rely on male allies or organise collectively. In the latter case, they have drawn on existing cycling activist movements and adapted them to feminist issues. This allows them to shift public representations of, and their own experience of, cycling and cycle repair as women.

---

[219] « (Refrain) La campagne noire d'été/les sacoches, la liberté/avec deux amixs pour chanter, je sais/qu'aucun connard n'pourra nous entraver
Comme on insulte les autos/qui passent trop près de nos vélos/Lever le doigt au trou du cul/qui se permet d'siffler nos corps nus
Dans mes mollets bronzés, poilus/assez de colère et d'amertume/pour des années de luttes à pédales/et de sueurs anti-patriarcales »

Conclusion

This chapter contributes to research on gender equality and cycling by exploring gendered velonomies, with a focus on repair and maintenance. It has shown that women are less likely than men both to cycle and to repair their own cycle, and has further explored the processes underlying women's exclusion from, and reluctance to engage in, these practices.

An initial approach to cycling practices through the lens of materiality demonstrates that the gendered cycling practices of men and women are anchored in the different designs, types of equipment, and material cultures centred around cycling. Men and women are encouraged to perform gender norms by cycles that are designed to encourage the development of gendered competences, thus contributing to assigning domestic mobility work to women. Moreover, feminist phenomenology enables the construction of the inhibited cycling practices of women to be understood in the frame of a patriarchal society, which contributes to their choice of cycles associated with ideas of comfort and safety rather than risk-taking, competition, and adventure. Furthermore, heterosexual relationships are spaces in which gendered dynamics come into play; these dynamics further shape cycle use and ownership.

In the second section, I show that the concepts of domestic mobility work and inhibited cycling practices also apply to repair and maintenance practices. Indeed, when it comes to cycle repair, the gendered aspect of active sports more generally, and cycling specifically, combine with the heavily gendered associations of manual labour and technical work. Due to the existence of these different layers, cycle repair is an extremely masculine practice. I focus on spaces of repair herein because they represent patriarchal environments that reproduce themselves through various mechanisms of exclusion; these factors produce the conditions that result in women experiencing low self-confidence, discomfort in spaces of repair and maintenance, and an inhibition regarding cycle repair. As a result, women often do not feel legitimate and distrust their own abilities when it comes to repair and maintenance. This deters women not only from engaging with repair and maintenance, but also from acquiring new skills. Once again, family structures contribute to the gendering of repair practices, in light of the referential role of the father in the household and the often-gendered share of repair within heterosexual

relationships.

The third and last section of this chapter discusses initiatives for a feminist appropriation of the cycle. Women attempt to transform the script assigned to them, according to which they are passive regarding the tools that they use (including their cycle itself). Women accordingly develop individual strategies that allow them to enforce their legitimacy in male-dominated spaces, or to create collective movements that enable them to advocate for their rights while also learning together and sharing experiences. These diverse feminist initiatives transform both women's resources and common representations of cycle repair and maintenance.

Conclusion

"Broken bicycles, Old busted chains, Rusted handle bars Out in the rain.

Somebody must

Have an orphanage for

These things that nobody

Wants any more

September's reminding July

It's time to be saying ... good-bye."

Tom Waits, "Broken Bicycles", 1982

Two months ago, I took my cycle to a shop that had recently opened in Lyon. Several friends were very surprised to hear that I had done this: "Can't you repair it yourself? You're literally writing a thesis about cycle repair. It's ridiculous to hire someone else to do it." The truth is that, six years after my first experiences of cycle repair, which began with my beloved greenish-grey Melbourne cycle, I still did not feel overly confident in my repair skills. Moreover, the discussions that I had with numerous cyclists and mechanics had convinced me – as, I hope, they have convinced the reader of this thesis – that cycle repair and maintenance is a serious matter that deserves some consideration and respect. Hiring a professional mechanic for a general service and graciously paying the fee required felt like a good way to show my appreciation for the repair ecosystem that I had been researching.

This consideration for repair and maintenance practices is something that I have attempted to convey in this thesis, through an in-depth discussion of these practices as they unfold in the cities of Lyon and Melbourne. This research was an international comparative case study and employed mixed methods, as well as a multi-sited approach.

In this thesis, I provided an overview of cycle repair and maintenance practices, as defined,

delimited, and experienced by both cyclists and repairers. It has demonstrated that repair and maintenance strongly affects cyclists, in direct or indirect ways. It has shown that repair and breakdown are blurry and unstable processes of enquiry, requiring a range of skills and tools that are very unevenly distributed among cyclists in both cities. They are sometimes frustrating experiences that may require improvisation. Cycle repair practices are also quite heterogeneous; extreme differences co-exist and overlap within a single urban environment, and within the experience of a given cyclist. One central issue in cycle repair practices is the importance of regular maintenance, something that may give rise to tensions between cyclists and mechanics.

In order to address the research questions presented in the introduction of this thesis, I drew attention to the cycle–cyclist relationship. Indeed, I believe that this relationship is at the heart of repair and cycling practices. This is the reason why I introduced, defined, and developed the concept of velonomy in the present research. This concept, based on its current use among repair activists and on Illich's theory of convivial tools, draws attention to what is afforded by the cycle– cyclist relationship. A velonomous cycle–cyclist relationship is one in which the cyclist may achieve autonomy in riding and repairing their cycle, and is able to use it for individual and collective aims. Velonomy is a relational and processual concept, distributed between the cyclist, the cycle itself as it is designed, advertised and sold, the urban ecosystem of repair, and the socio-economic conditions in which cycling takes place.

The concept of velonomy also facilitates a discussion of the political meanings of cycling and repair, as it considers the restrictions that can be placed on the freedoms that the cycle allows. These political insights were the focus of the last two chapters of this thesis, which discussed velonomy as it is unevenly shared between different socioeconomic groups, thus creating inequities and differences in access to mobility.

In the fourth chapter, I dwelled on consumer society as it impacts and transforms the cycle–cyclist relationship. I showed that the cycle is a consumer good, and that, as such, it is subject to consumer trends and dynamics such as planned obsolescence. Repair itself is often a

commercial operation that can be costly for cyclists. Because of this, cyclists of different income levels have different levels of access to different repair options, and thus engage in different repair practices. A study of the ecosystem of repair showed that different spaces of repair play different roles in a consumer society. Even non-profit repair spaces, despite advocating for anti-consumerist lifestyles, are subjected to market dynamics. Moreover, the activity of cycle shops is often profit-driven, as manifested in the strong importance of sales of new cycles and spare components in the income of most cycle shops.

The fifth chapter focused on gendered velonomies. Specifically, it highlighted the gendered cycling experiences that are often embodied in the possession of different types of cycling equipment, which can respectively represent and encourage competition, risk-taking, and adventure (for men) or engagement with domestic mobility work (for women). I further demonstrated that, in repair spaces, women are faced with a strongly patriarchal environment that deters them from engaging with cycle repair and maintenance. Even the most skilled female repairers are required to develop strategies to assert their legitimacy in these spaces. However, a growing number of individual and collective initiatives aim to disrupt the script of female passivity and help women to transform the meanings associated with cycles and tools.

How can cyclists achieve autonomy in their riding and repair practices? The central concept of this thesis, velonomy, facilitates a deeper understanding of cycling and repair skills and practices. Developing velonomy is a process that simultaneously involves the technical design of a cycle, the repairs and cycling skills of the cyclist, and the affordances of the social and urban environment in which cycling occurs. This thesis demonstrates that all of these elements can evolve in ways that facilitate the engagement of cyclists with their cycle.

Moreover, as cycling policies often focus on the increase of cycling modal share, I instead show the relevance of a study of these unequal velonomies.

This study was conducted in two locations: Melbourne and Lyon. This comparative approach

enabled me to draw attention to a few aspects of repair practices that differed strongly between both cities. Melbourne cyclists, who on average earn much higher incomes, often ride cycles that they purchased new, while Lyon cyclists are more likely to ride old second-hand cycles in poorer condition. The cycle repair ecosystem is thus more oriented around second-hand parts in France than in Melbourne, where the use of second-hand cycles is less widespread, and where cycle shops are more popular. The strong self-repair workshop culture (and the increased number of these spaces present) in the city of Lyon transforms the resources available and facilitates cyclists' acquisition of velonomy.

One ancillary aim of this study was to describe spaces and actors of repair, along with practices of repair in general. The second chapter of this thesis is dedicated to this specific issue, and allowed me to characterise repair as a practice that is accessible to anyone, but that requires specific skills and know-how. I highlighted the highly uneven distribution of these capabilities and repair resources among cyclists in both cities. Practices of repair are strongly embodied, may produce feelings of frustration or pride, and may also involve improvisation and experimentation.

The entirety of this thesis contributes to this depiction of cycle repair and maintenance practices. I present figures and stories illustrating the state of repair competences, spaces, and usual practices. These practices are sustained by a lively ecosystem of repair in each city, each of which contributes in different ways to the acquisition of velonomy. People engage in contrasting ways with this ecosystem, depending on their repair skills, expertise, and the type of cycling practices with which they are familiar.

Another goal of this research was to reflect on the links between cycling and repair, two separate but intertwined practices, which are linked in that they both mobilise the same object (the cycle) and both bring the cycle–cyclist relationship into play. I argued that repair practices highlight and transform the cycle–cyclist relationship. I further demonstrated the interdependence of cycling and repair, as each of these practices creates the necessity for the

other. The concept of velonomy suggests that cycling and repair must be considered together, as these practices evolve in parallel ways. Cyclists often develop some repair expertise simultaneously with becoming experienced riders. This intertwining is emphasised in the course of processes of learning repair and learning how to ride.

Bringing the same interest and importance to practices of cycling and repair is a very fruitful approach. Indeed, the importance of practices of repair in determining riding is often forgotten. However, repair and breakdown are never far from the cyclist's mind. Indeed, cycle breakdowns are frequent, and cycling practices are often engaged in while keeping the possibilities of future mechanical issues in mind. In addition, many cycle breakdowns or mechanical issues are not identified or addressed by the cyclists experiencing them, and many cyclists regularly ride cycles that are dysfunctional in some way. This thesis thus advocates for taking repair and maintenance into account in any discussion of cycling practices.

The last stated aim of this research was to identify and assess the environmental and socio-economic factors of velonomy, a question to which all chapters of this thesis provide relevant elements of an answer.

I suggest that we should be wary of naturalising repair and maintenance skills, the acquisition of which are often facilitated or inhibited by socio-economic factors. The discussions in chapters four and five contribute to this contextualisation, arguing that the velonomy of women is inhibited by a patriarchal repair environment, in a way that is also reproduced by family structures and heterosexual relationships. Lower-income cyclists are simultaneously encouraged to acquire repair skills and more heavily sanctioned for the lack of such skills, as they are often more reluctant to resort to professional repair and have less access to reliable cycles.

Another central element of velonomy is cycle design. Some cycles are designed in ways that allow easier repair (such as single-speed cycles, which do not require derailleurs) or are equipped with more durable components (like anti-puncture tyres or internal gear hubs). Moreover, the market of cycle production is subject to dynamics of planned obsolescence,

although these dynamics co-exist with the development of new and good-quality products and materials. Cycle design also contributes to unequal velonomies, as different socio-economic groups use different cycles. For instance, women often ride cycles designed for riding at a lower speed and for fulfilling the domestic role assigned to them, whereas men tend to own both a higher number of cycles and cycles that are designed for more adventurous rides. In addition, cycles accessible to lower-income cyclists, such as second-hand or low-priced cycles, are more likely to require frequent repair.

One last environmental factor related to velonomy is the ecosystem of repair. This study has shown that cycle shops and community workshops both contribute to the acquisition of velonomy, since they are spaces in which cyclists may discuss the condition of their cycle, and where professional mechanics and workshop volunteers alike often advocate for a maintenance-oriented attitude to cycle repair. Self-repair workshops are extremely important in this aim, as they are spaces that focus on velonomy by providing tools, components, and technical advice to anyone willing to repair their own cycle. Cycle shops may also contribute to the development of velonomy through implementing transparent methods, explaining the repairs that they undertake, offering regular service reminders, and welcoming customers without pre-conceived judgement. Moreover, some collective initiatives, such as feminist movements, focus on the access that marginalised groups have to cycling and repair, and provide cyclists with resources that contribute to their velonomy.

Overall, this thesis offers an overview of cycling repair and maintenance practices in France and Australia, and contributes to their conceptualisation. It presents cycle repair and maintenance not only as essential to the realisation of cycling practices, but also as capable of transforming them. It is a call to take into account some of the issues related to power, inequity, and social justice that affect cycling practices, whether directly or indirectly. This thesis is also a celebration of repair and maintenance as a work and craft that often goes unnoticed, despite being practiced by thousands of people who expend vast amounts of effort in learning and applying specific skills.

Additionally, this thesis has highlighted cycling not only as a means of transportation, leisure activity, or sport, but also as a material practice, focussing attention on the cycle as a material and thus vulnerable object. One consequence of adopting such a perspective is that the concept of velonomy can be applied to assessing the impact of specific public policy: how does it transform the cycle–cyclist relationship? Does it lead to more autonomy and a better appropriation of the cycle?

The concept of velonomy could also be employed when it comes to researching technological innovations and trends related to the cycle, such as electric cycles and their use, battery recycling, fixie cycles, etc. These technological aspects could benefit from debates related to the ways in which they transform the cycle–cyclist relationship and contribute to, or inhibit, velonomy. Moreover, discussions of the relationship between the user of a means of transportation and the materiality involved in this transportation are very fruitful and may be applicable to many other forms of transportation.

Finally, the association made in this thesis between cycling and repair as two intertwined activities may be brought into question once more by the development of cycle rental services, from the more traditional bike-sharing services to new service models that provide long-term cycle rental along with professional repair (for example, the Dutch firm Swapfiets and the service MétroVélo in the city of Grenoble). These services question the link between cycling and repair and, to a certain extent, the nature of the cycle–cyclist relationship.

When I went to pick up my cycle at the shop, I was very disappointed to realise that my cycle had not been repaired very well. The tyres had not been inflated by the mechanic and were almost flat after three weeks in the shop. My brakes were strangely loose, while the gears, although they had stopped clicking, had also acquired a strange new behaviour: it was impossible to set the second gear without slipping to the third one. I would have to perform some of these adjustments myself, and to cope with a faulty cycle until then.

As I am writing these words, my cycle still needs repair. The uncomfortable feeling that I get while riding this slightly dysfunctional cycle several times a day acts as a reminder of the blurry

and unexpected aspects of repair. Indeed, it is illusory to believe that one can fully delegate their responsibility towards the material world, just as it is illusory to think that the continuous processes of decay affecting material objects can be addressed once and for all by a single operation of repair.

References

6T, Bureau d'études. 2018. 'Le Marché Du Vélo Personnel à Paris : Quelle Évolution En Regard Des Offres de Vélos En Libre-Service ? Enquête Auprès Des Magasins de Vélos Parisiens.' ADEME.

Abasahl, Farhad, Kaveh Bakhsh Kelarestaghi, and Alireza Ermagun. 2018. 'Gender Gap Generators for Bicycle Mode Choice in Baltimore College Campuses'. *Travel Behaviour and Society* 11 (April): 78–85. https://doi.org/10.1016/j.tbs.2018.01.002.

Abord de Chatillon, Margot. 2021. 'Feminine Velonomy: Women's Experiences of Bicycle Repair and Maintenance within Patriarchal Contexts (in France and Australia)'. In *Cycling Societies: Emerging Innovations, Inequalities and Governance*, edited by Dennis Zuev, Katerina Psarikidou, and Cosmin Popan, 137–55. Environment and Sustainability. Routledge Studies.

Abord de Chatillon, Margot. 2022. 'Appropriating the Bicycle: Repair and Maintenance Skills and the Bicycle-Cyclist Relationship'. In *Becoming Urban Cyclists*, edited by Matthieu Adam and Nathalie Ortar, 215–43. Chester: Chester University press. https://storefront.chester.ac.uk/index.php?main_page=product_info&cPath=12_14&products_id=1094.

Abord de Chatillon, Margot, and Manon Eskenazi. 2022. 'Devenir cycliste, s'engager en cycliste : communautés de pratiques et apprentissage de la vélonomie'. *SociologieS*, February. https://journals.openedition.org/sociologies/18924#quotation.

Abord de Chatillon, Margot, Nathalie Ortar, and David Sayagh. 2021. 'Le vélo : un objet qui révèle, renforce et perturbe l'ordre du genre'. *Recherches sociologiques et anthropologiques*, no. 52–2 (December): 25–51. https://doi.org/10.4000/rsa.4963.

'Accidentologie Routière Bilan 2019'. 2020. Direction départementale des territoires du Rhône. http://www.rhone.gouv.fr/Politiques-publiques/Transport-mobilite-securite-routiere-et-fluviale/Securite-routiere/Accidentologie-dans-le-Rhone-et-en-region-

Auvergne-Rhone-Alpes/Bilans-annuels/Departement-du-Rhone.

Adam, Matthieu. 2018. 'Un quart de « véloveurs », 59% d'hommes. Qui sont les cyclistes lyonnais·es ? [Véléval #2]'. Billet. CyclOPs. 10 July 2018. https://cyclops.hypotheses.org/454.

Adam, Matthieu. 2021. 'Certaines politiques de promotion du vélo ont renforcé une conception inégalitaire de l'accès à l'espace public'. *Le Monde*, 27 February 2021, L'Abécédaire de la ville edition. https://www.lemonde.fr/smart-cities/article/2021/02/27/certaines-politiques-de-promotion-du-velo-ont-renforce-une-conception-inegalitaire-de-l-acces-a-l-espace-public_6071386_4811534.html.

Adam, Matthieu. 2023. 'Pratiques et Socialisations Du Cycliste Urbain Contemporain. De La Production de l'espace Aux Inégalités Sociospatiales'. In *L'individu Mobile: Modes de Vie, Routines et Espace Vécu*, edited by Thomas Buhler. Encyclopédie SCIENCES. Paris: ISTE.

ADEUS. 2010. 'Observatoire Des Déplacements. Enquête Ménages Déplacements. Résultats Essentiels CUS (1988-1997-2009)'. Strasbourg: ADEUS. http://www.adeus.org/productions/enquete-menages-deplacements-resultats-essentiels-cus-1988-1997-2009-observatoire-des-deplacements/files/resultats-emd-cus.

Akar, Gulsah, Nicholas Fischer, and Mi Namgung. 2012. 'Bicycling Choice and Gender Case Study: The Ohio State University'. *International Journal of Sustainable Transportation* 7 (January). https://doi.org/10.1080/15568318.2012.673694.

Akerlof, George A. 1978. 'The Market for "Lemons": Quality Uncertainty and the Market Mechanism'. In *Uncertainty in Economics*, 235–51. Academic Press. https://doi.org/10.1016/B978-0-12-214850-7.50022-X.

Akrich, Madeleine. 1987. 'Comment décrire les objets techniques ?' *Techniques & Culture. Revue semestrielle d'anthropologie des techniques,* no. 9: 49–64. https://doi.org/10.4000/tc.4999.

Akrich, Madeleine. 1992. 'The De-Scription of Technical Objects'. In *Shaping*

Technology/Building Society. Studies in Sociotechnical Change, edited by Bijker, W. & Law, and J., 205–24. MIT Press. https://halshs.archives-ouvertes.fr/halshs-00081744.

Akrich, Madeleine, and Bruno Latour. 1992. 'A Summary of a Convenient Vocabulary for the Semiotics of Human and Nonhuman Assemblies'. In *Shaping Technology/ Building Society Studies in Sociotechnical Change*, 259. The MIT Press. https://halshs.archives-ouvertes.fr/halshs-00081748.

Aldred, Rachel. 2010. '"On the Outside": Constructing Cycling Citizenship'. *Social & Cultural Geography* 11 (1): 35–52. https://doi.org/10.1080/14649360903414593.

Aldred, Rachel. 2013a. 'Incompetent or Too Competent? Negotiating Everyday Cycling Identities in a Motor Dominated Society'. *Mobilities* 8 (2): 252–71. https://doi.org/10.1080/17450101.2012.696342.

Aldred, Rachel. 2013b. 'Who Are Londoners on Bikes and What Do They Want? Negotiating Identity and Issue Definition in a "Pop-up" Cycle Campaign'. *Journal of Transport Geography* 30 (June): 194–201. https://doi.org/10.1016/j.jtrangeo.2013.01.005.

Aldred, Rachel, and Sian Crosweller. 2015. 'Investigating the Rates and Impacts of near Misses and Related Incidents among UK Cyclists'. *Journal of Transport & Health* 2 (3): 379–93. https://doi.org/10.1016/j.jth.2015.05.006.

Aldred, Rachel, Bridgett Elliott, James Woodcock, and Anna Goodman. 2016. 'Cycling Provision Separated from Motor Traffic: A Systematic Review Exploring Whether Stated Preferences Vary by Gender and Age'. *Transport Reviews* 37 (1): 29–55.

Aldred, Rachel, and Anna Goodman. 2018. 'Predictors of the Frequency and Subjective Experience of Cycling near Misses: Findings from the First Two Years of the UK Near Miss Project'. *Accident Analysis & Prevention* 110 (January): 161–70. https://doi.org/10.1016/j.aap.2017.09.015.

Allen, Matilda, and Jessica Allen. 2015. 'Health Inequalities and the Role of the Physical and Social Environment'. In *The Routledge Handbook of Planning for Health and Well-Being: Shaping a Sustainable and Healthy Future*, 89–107. Routledge.

Anable, Jillian, and Birgitta Gatersleben. 2005. 'All Work and No Play? The Role of Instrumental and Affective Factors in Work and Leisure Journeys by Different Travel Modes'. *Transportation Research Part A: Policy and Practice, Positive Utility of Travel*, 39 (2): 163–81. https://doi.org/10.1016/j.tra.2004.09.008.

Anantharaman, Manisha. 2017. 'Elite and Ethical: The Defensive Distinctions of Middle-Class Bicycling in Bangalore, India'. *Journal of Consumer Culture* 17 (3): 864–86. https://doi.org/10.1177/1469540516634412.

Arnold, Lynnette. 2012. 'Reproducing Actions, Reproducing Power: Local Ideologies and Everyday Practices of Participation at a California Community Bike Shop: Ideologies and Practices of Participation'. *Journal of Linguistic Anthropology* 22 (3): 137–58. https://doi.org/10.1111/j.1548-1395.2012.01153.x.

Ashmore, David P., Roselle Thoreau, Corina Kwami, Nicola Christie, and Nicholas A. Tyler. 2018. 'Using Thematic Analysis to Explore Symbolism in Transport Choice across National Cultures'. *Transportation*, June. https://doi.org/10.1007/s11116-018-9902-7.

Aultmann-Hall, Lisa, Jonathan Dowds, and Brian H.Y. Lee. 2012. 'Innovative Data Collection for Pedestrians, Bicycles, and Other Non–Motor Vehicle Modes'. *TR News*, 2012, 280 edition.

Baker, Lucy. 2018. 'Scripting Mobilities in Sub-Saharan Africa: A Case Study of Second-Hand Bicycle Networks'. School of Geography and Planning, Cardiff University.

Baker, Lucy. 2020. 'Constructing Sub-Saharan African Mobilities through the Flow of Second-Hand Objects: Scripting Bicycles for Namibian Users'. *Journal of Transport Geography* 83 (February): 102656. https://doi.org/10.1016/j.jtrangeo.2020.102656.

Baldwin-White, Adrienne. 2021. '"When a Girl Says No, You Should Be Persistent Until She Says Yes": College Students and Their Beliefs About Consent'. *Journal of Interpersonal Violence* 36 (19–20): NP10619–44. https://doi.org/10.1177/0886260519875552.

Banister, David. 2005. *Unsustainable Transport: City Transport in the New Century*. Taylor & Francis.

Barber, Jamie. 2003. 'The Informally Trained Mechanic: Skill Acquisition in the Workplace'.

Journal of Vocational Education & Training 55 (2): 133–48. https://doi.org/10.1080/13636820300200222.

Barbusse, Beatrice. 2016. *Du sexisme dans le sport*. Appaloosa LHS Editions. Batterbury, Simon. 2003. 'Environmental Activism and Social Networks:

Campaigning for Bicycles and Alternative Transport in West London'. *The ANNALS of the American Academy of Political and Social Science* 590 (1): 150–69. https://doi.org/10.1177/0002716203256903.

Batterbury, Simon, and Tim Dant. 2019. 'The Imperative of Repair: Fixing Bikes -for Free'. In *Repair, Brokenness, Breakthrough: Ethnographic Responses*, F. Martinez and P. Laviolette, 249–66. New York: Bergahn. https://www.academia.edu/40324486/The_Imperative_of_Repair_Fixing_Bikes_-for_Free.

Batterbury, Simon, and Inès Vandermeersch. 2016a. 'Community Bicycle Workshops and "Invisible Cyclists" in Brussels'. In *Bicycle Justice and Urban Transformation: Biking for All?*

Batterbury, Simon, and Inès Vandermeersch. 2016b. 'Community Bicycle Workshops and "Invisible Cyclists" in Brussels'. In *Bicycle Justice and Urban Transformation: Biking for All?*

Beaud, Stéphane, and Florence Weber. 2010. *Guide de l'enquête de terrain*. 4e édition. Paris: La Découverte.

Beauvoir, Simone de. 1986. *Le deuxième sexe, tome 1 : Les faits et les mythes*. Paris: Gallimard.

Bereni, L., S. Chauvin, A. Jaunait, and A. Revillard. 2012. *Introduction Aux Études Sur Le Genre*. 2e édition. Bruxelles: De Boeck. https://dare.uva.nl/search?identifier=bb9e1458-10fe-43af-85af-00d16bf40494.

Bessière, Céline, and Sibylle Gollac. 2020. *Le genre du capital: Comment la famille reproduit les inégalités*. La Découverte.

Bethlehem, Jelke. 2010. 'Selection Bias in Web Surveys'. *International Statistical Review* 78 (2): 161–88. https://doi.org/10.1111/j.1751-5823.2010.00112.x.

'Bicycle Plan 2016-2020'. 2015. City of Melbourne.

'Bicycle Rider Statistics'. 2020. Victoria: Transport accident commission. https://www.tac.vic.gov.au/road-safety/statistics/summaries/bicycle-rider-statistics.

Bijker, Wiebe E. 1995. *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change*. USA: MIT Press.

Bijker, Wiebe, and Trevor Pinch. 2012. 'Preface to the Anniversary Edition'. In *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge, MA, USA: MIT Kindle edition.

Bissell, David. 2018. *Transit Life. Urban and Industrial Environments*. MIT Press.

Boterman, Willem R. 2018. 'Carrying Class and Gender: Cargo Bikes as Symbollic Markers of Egalitarian Gender Roles of Urban Middle Classes in Dutch Inner Cities'. *Social & Cultural Geography*, July. https://www.tandfonline.com/doi/abs/10.1080/14649365.2018.1489975.

Bouillon, Florence, and Jérôme Monnet. 2016. 'Éditorial'. *Espaces et societes* n° 164-165 (1): 9–17.

Bourdieu, Pierre. 1979. *La Distinction*. Le sens commun.

Bourke, Peter. 2016. 'Bicycle Industry Survey Report'. Bicycle Industry Australia.

Boyce, James. 2013. 1835: *The Founding of Melbourne & the Conquest of Australia*.3rd ed. Black Inc.

Boyce, T, and S Patel. 2009. 'The Health Impacts of Spatial Planning Decisions.' *The King's Fund*.

Bradley, Karin. 2016. 'Bike Kitchens – Spaces for Convivial Tools'. *Journal of Cleaner Production*, September. https://doi.org/10.1016/j.jclepro.2016.09.208.

Braudel, Fernand. 1992. *Civilization and Capitalism, 15th-18th Century, Vol. I: The Structure of Everyday Life*. University of California Press.

Brömmelstroet, Marco te, Anna Nikolaeva, Meredith Glaser, Morten Skou Nicolaisen, and Carmen Chan. 2017. 'Travelling Together Alone and Alone Together: Mobility and Potential Exposure to Diversity'. *Applied Mobilities* 2 (1): 1–15.

https://doi.org/10.1080/23800127.2017.1283122.

Bruno, Matthew, and Anna Nikolaeva. 2020. 'Towards a Maintenance-Based Approach to Mode Shift: Comparing Two Cases of Dutch Cycling Policy Using Social Practice Theory'. *Journal of Transport Geography* 86 (June): 102772. https://doi.org/10.1016/j.jtrangeo.2020.102772.

Bugedo Caroca, Paloma. 2021. 'Building Resilience through Community Bike Workshops: The Grassroots Case of T He Bike Shed in CERES'. Masters dissertation, Melbourne: University of Melbourne.

Callon, Michel. 1986. 'Éléments Pour Une Sociologie de La Traduction : La Domestication Des Coquilles Saint-Jacques et Des Marins-Pêcheurs Dans La Baie de Saint-Brieuc'. *L'Année Sociologique* (1940/1948-) 36: 169–208.

Cárcamo, Carolina, Amparo Moreno, and Cristina del Barrio. 2021. 'Girls Do Not Sweat: The Development of Gender Stereotypes in Physical Education in Primary School'. *Human Arenas* 4 (2): 196–217. https://doi.org/10.1007/s42087-020-00118-6.

Cass, Noel, and Katharina Manderscheid. 2018. 'The Autonomobility System'. In *Mobilities, Mobility Justice and Social Justice*, edited by Nancy Cook and David Butz. Routledge.

Cassell, Joan. 1997. 'Doing Gender, Doing Surgery: Women Surgeons in a Man's Profession'. *Human Organization* 56 (1): 47–52.

Cassell, Joan, and Hélène Le Doaré. 2000. 'Différence par corps : les chirurgiennes'. *Les Cahiers du Genre* 29 (1): 53–81.

Casselot, Marie-Anne. 2018. 'Pour une phénoménologie féministe du doute'. *Recherches féministes* 31 (2): 71–87. https://doi.org/10.7202/1056242ar.

Castillo-Manzano, José I., Mercedes Castro-Nuño, and Lourdes López-Valpuesta. 2015. 'Analyzing the Transition from a Public Bicycle System to Bicycle Ownership: A Complex Relationship'. *Transportation Research Part D: Transport and Environment* 38 (July): 15–26. https://doi.org/10.1016/j.trd.2015.04.004.

Caudron, Damien. 2016. 'Enquête Déplacements 2015 de l'aire Métropolitaine Lyonnaise'. Lyon: Sytral.

Chang, Heewon. 2016. *Autoethnography as Method*. New York: Routledge. https://doi.org/10.4324/9781315433370.

Chanteloup, Laine, Clémence Perrin-Malterre, Antoine Duparc, and Anne Loison. 2016. 'Quels points de vue sur les espaces partagés entre humains et animaux sauvages ?' *Espaces et societes* n° 164-165 (1): 33–47.

Cherry, Christopher R., Jonathan X. Weinert, and Yang Xinmiao. 2009. 'Comparative Environmental Impacts of Electric Bikes in China'. *Transportation Research Part D: Transport and Environment 14* (5): 281–90. https://doi.org/10.1016/j.trd.2008.11.003.

Chopelin, Paul, and Pierre-Jean Souriac. 2019. 'Nouvelle Histoire de Lyon et de la Métropole'. *Sciences de l'Homme et de la Société*.

Clair, Isabelle. 2013. 'Pourquoi penser la sexualité pour penser le genre en sociologie ?Retour sur quarante ans de réticences'. *Cahiers du Genre* 54 (1): 93–120. https://doi.org/10.3917/cdge.054.0093.

Clarsen, Georgine. 2017. '"Australia – Drive It Like You Stole It": Automobility as a Medium of Communication in Settler Colonial Australia'. *Mobilities* 12 (4): 520–33. https://doi.org/10.1080/17450101.2017.1332717.

Clarsen, Georgine. 2019. 'Of Girls and Spanners: Feminist Politics, Women's Bodies and the Male Trades'. In *Everyday Revolutions: Remaking Gender, Sexuality and Culture in 1970s Australia*, edited by Michelle Arrow and Angela Woollacott, ANU Press, 23–36. Canberra, Australia.

Cockburn, Cynthia. 1991. *In the Way of Women: Men's Resistance to Sex Equality in Organizations*. ILR Press.

Coelho, Margarida C., and Diogo Almeida. 2015. 'Cycling Mobility – A Life Cycle Assessment Based Approach'. *Transportation Research Procedia*, 18th Euro Working Group on Transportation, EWGT 2015, 14-16 July 2015, Delft, The Netherlands, 10 (January):

443–51. https://doi.org/10.1016/j.trpro.2015.09.094.

Coleman, Karly A. 2015. 'Bicycles as Objects: Identity, Attachment, and Membership Categorization Devices'. https://doi.org/10.7939/R3QV3C865.

Connell, Raewyn. 2014. 'Feminist Scholarship and the Public Realm in Postcolonial Australia'. *Australian Feminist Studies* 29 (80): 215–30. https://doi.org/10.1080/08164649.2014.928187.

Connell, Raewyn, Rebecca Pearse, Fran Collyer, João Marcelo Maia, and Robert Morrell. 2018. 'Negotiating with the North: How Southern-Tier Intellectual Workers Deal with the Global Economy of Knowledge'. *The Sociological Review* 66 (1): 41–57. https://doi.org/10.1177/0038026117705038.

Cook, Ian. 2005. 'Participant Observation'. In *Methods in Human Geography: A Guide for Students Doing a Research Project*, by Robin Flowerdew and David Martin, 167–88. Pearson Education.

Cook, Matthew, and Tim Edensor. 2017. 'Cycling through Dark Space: Apprehending Landscape Otherwise'. *Mobilities* 12 (1): 1–19. https://doi.org/10.1080/17450101.2014.956417.

Courbe, Thomas. 2020. 'Impact Économique et Potentiel de Développement Des Usages Du Vélo En France'. Inddigo - Vertigolab.

Courel, Jérémy, and Dominique Riou. 2014. 'Le vélo retrouve sa place parmi les mobilités du quotidien'. Note rapide 670. Île-de-France: Institut d'Aménagement et d'Urbanisme Île-de-France. https://www.iau-idf.fr/fileadmin/NewEtudes/Etude_1120/NR_670web.pdfj.

Cox, Peter. 2005. 'Conflicted Agendas in Selling Cycling'.

Cox, Peter. 2014. 'Wider Implications of Bike Design Diversity'. Presented at the Radfahren In der Stadt lecture series, TU Wien, April 10.

Cox, Peter. 2017. 'Bicycle Design History and Systems of Mobility'. In *Mobilising Design*. Routledge.

Cox, Peter. 2019. *Cycling: A Sociology of Vélomobility*. London: Routledge. https://doi.org/10.4324/9781315533698.

Cox, Peter, and Frederick Van de Walle. 2007. 'Bicycles Don't Evolve: Velomobiles and the Modelling of Transport Technologies'. In *Cycling and Society*, 113– 31.

Crawford, Matthew B. 2010. *Shop Class as a Soulcraft*. Reprint. Penguin Books.

Crépin, Olivier, Cécile Hubert, Simon Mauroux, and Raphaël Meyer. 2020. 'Loi d'orientation des mobilités : Transfert et modalités d'exercice de la compétence d'organisation de la mobilité dans les communautés de communes'. Paris: AC2F, Transdev. https://www.francemobilites.fr/sites/frenchmobility/files/inline-files/Questions-Reponses-LOM-AdCF-competence-AOM.pdf.

Damont, Nicolas, and Olivier Pégard. 2017. 'Le masculin haut en couleurs. L'apprentissage du football professionnel'. *Ethnologie française* 47 (1): 131–

40. https://doi.org/10.3917/ethn.171.0131.

Dant, Tim. 1998. 'Playing With Things: Objects and Subjects in Windsurfing'. *Journal of Material Culture* 3 (1): 77–95. https://doi.org/10.1177/135918359800300104.

Dant, Tim. 2004. 'The Driver-Car'. *Theory, Culture & Society* 21 (4–5): 61–79. https://doi.org/10.1177/0263276404046061.

Dant, Tim. 2005. *Materiality and Society*. Maidenhead: Open University Press.

Dant, Tim. 2010. 'The Work of Repair: Gesture, Emotion and Sensual Knowledge'. *Sociological Research Online* 15 (3): 1–22. https://doi.org/10.5153/sro.2158.

Dant, Tim. 2019. 'Inside the Bicycle: Repair Knowledge for All'. In *Repair Work Ethnographies: Revisiting Breakdown, Relocating Materiality*, edited by Ignaz Strebel, Alain Bovet, and Philippe Sormani, 283–312. Singapore: Springer. https://doi.org/10.1007/978-981-13-2110-8_10.

Dant, Tim, and Belinda Wheaton. 2007. 'Windsurfing : An Extreme Form of Material and

Embodied Interaction?' *Anthropology Today* 23 (6): 8–12.

Dauncey, Hugh. 2012. *French Cycling: A Social and Cultural History*. Liverpool University Press.

Davies, Alan. 2015. 'Cycling: How Do Australian Cities Compare with Paris?' The Urbanist (blog). 12 January 2015. https://blogs.crikey.com.au/theurbanist/2015/01/12/cycling-how-do-australian-cities-compare-with-paris/.

Del Real Hobon, Bernardita. 2015. 'Cooperative Bicycle Workshops as Community-Driven Urban Planning in France'. Masters dissertation, Melbourne: University of Melbourne.

Delbos, Geneviève, and Paul Jorion. 1990. *La transmission des savoirs*. Paris, France: Éd. de la Maison des sciences de l'homme.

Delphy, Christine. 2003. 'Par où attaquer le « partage inégal » du « travail ménager » ?' *Nouvelles Questions Féministes* 22 (3): 47–71. https://doi.org/10.3917/nqf.223.0047.

Delphy, Christine, and Diana Leonard. 2019. *L'exploitation domestique*. Syllepse.

Denis, Jérôme, Alessandro Mongili, and David Pontille. 2016. 'Maintenance & Repair in Science and Technology Studies'. *TECNOSCIENZA: Italian Journal of Science & Technology Studies* 6: 5–16.

Denis, Jérôme, and David Pontille. 2012. 'Travailleurs de l'écrit, matières de l'information'. *Revue d'anthropologie des connaissances* Vol. 6, n° 1 (1): 1–

20.

Denis, Jérôme, and David Pontille. 2015. 'Material Ordering and the Care of Things'. *Science, Technology, & Human Values* 40 (3): 338–67. https://doi.org/10.1177/0162243914553129.

Denis, Jérôme, and David Pontille. 2020a. 'Why Do Maintenance and Repair Matter?' In *The Routledge Companion to Actor-Network Theory*, edited by Anders Blok, Ignacio Farías, and Celia Roberts, 283–93.

Denis, Jérôme, and David Pontille. 2020b. 'Maintenance et attention à la fragilité'. *SociologieS*, May. https://doi.org/10.4000/sociologies.13936.

Department of Health. 2011. 'Start Active, Stay Active: A Report on Physical Activity from the

Four Home Countries'. London: Department of Health.

Depraetere, Joke, Christophe Vandeviver, Tom Vander Beken, and Ines Keygnaert. 2020. 'Big Boys Don't Cry: A Critical Interpretive Synthesis of Male Sexual Victimization'. *Trauma, Violence, & Abuse* 21 (5): 991–1010. https://doi.org/10.1177/1524838018816979.

Dibb, Sally, and Lyndon Simkin. 2001. *Marketing Briefs: A Revision and Study Guide.* London: Routledge. https://doi.org/10.4324/9780080511085.

Dill, Jennifer. 2019. 'Bicycle Research 2019: More than Helmets and Head Injuries'. Blog. Jennifer Dill, Ph.D. (blog). 14 August 2019. https://jenniferdill.net/2019/08/14/bicycle-research-2019-more-than-helmets-and-head-injuries/.

Dill, Jennifer, and Nathan McNeil. 2013. 'Four Types of Cyclists? Examination of Typology for Better Understanding of Bicycling Behavior and Potential'. *Transportation Research Record: Journal of the Transportation Research Board*, no. 2387. https://trid.trb.org/view/1243025.

Dittmar, Helga. 1992. *The Social Psychology of Material Possessions: To Have Is to Be*. Hemel Hempstead, Hertfordshire : New York, N.Y: Prentice-Hall.

Djepa, Idrissa. 2019. 'Le genre à la Fédération Française de Cyclisme, vu par son journal officiel (1946-1952)'. Masters dissertation, Lyon: Université Claude Bernard Lyon 1.

Dorlin, Elsa. 2017. *Se défendre: Une philosophie de la violence*. La Découverte.

Dowsett, Owen. 2012. 'Making Things Last: The Fluid Order of Bicycle Repair'. Masters dissertation, Lancaster, United Kingdom: University of Lancaster. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1088.4568&rep=rep1&type=pdf.

Dupuy, Gabriel. 1999. *La dépendance automobile*. Paris: Economica.

Dusong, Clément. 2021. 'Les dynamiques de l'usage du vélo dans les espaces de banlieue : continuités, décalages et ruptures. Le cas de l'Île-de-France'. Paris, France: Université Paris Est.

Edensor, T. 2011. 'Entangled Agencies, Material Networks and Repair in a Building Assemblage: The Mutable Stone of St. Ann's Church, Manchester'. *Transactions of the Institute of British Geographers* 36 (2): 238–52.

Edgerton, David. 2006. *The Shock Of The Old: Technology and Global History since 1900*. Profile Books.

Ellis, Carolyn, and Arthur P. Bochner. 2000. 'Autoethnography, Personal Narrative, and Personal Reflexivity'. In *Handbook of Qualitative Research*, by N. K. Denzin and Y.S. Lincoln, 2d ed., 733–68. Thousand Oaks, CA: Sage.

Epiphane, Dominique. 2016. 'Les femmes dans les filières et les métiers « masculins » : des paroles et des actes'. *Travail, genre et societes* 36 (2): 161–66.

Eskenazi, Manon. 2022. 'Voir, faire et vivre la ville pour le vélo. Pratiques du vélo et politiques de mobilité dans deux métropoles européennes'. Thèse de doctorat, Paris: Université Paris-Est.

Evans, David M. 2019. 'What Is Consumption, Where Has It Been Going, and Does It Still Matter?' *The Sociological Review* 67 (3): 499–517. https://doi.org/10.1177/0038026118764028.

Evans, Isaac, Joshua Pansch, and Lila Singer-Berk. 2018. 'Factors Affecting Vehicle Passing Distance and Encroachments While Overtaking Cyclists'. *Institute of Transportation Engineers*. ITE Journal, 2018.

Farrell, Annemarie, Janet S. Fink, and Sarah Fields. 2011. 'Women's Sport Spectatorship: An Exploration of Men's Influence'. *Journal of Sport Management* 25 (3): 190–201. https://doi.org/10.1123/jsm.25.3.190.

Fauveaud, Gabriel, ed. 2018. *Les villes non occidentales : Comprendre les enjeux de la diversité urbaine*. PUM. Montréal: Presses de l'Université de Montréal. http://books.openedition.org/pum/11857.

Federici, Silvia. 2019. *Le capitalisme patriarcal*. La Fabrique Éditions. http://www.cairn.info/le-capitalisme-patriarcal--9782358721783.htm.

Ferber, Abby L. 2007. 'The Construction of Black Masculinity: White Supremacy Now and Then'. *Journal of Sport and Social Issues* 31 (1): 11–24. https://doi.org/10.1177/0193723506296829.

Ferrand, Bruno. 2016. 'Les ateliers d'auto-réparation de vélos sur la métropole de Lyon : Etude des facteurs d'évolution d'un contexte coopératif à une situation de concurrence et anticipation des impacts'. Mémoire de master, Lyon: VetAgro Sup.

Fincham, Ben. 2007. ''Generally Speaking People Are in It for the Cycling and the Beer': Bicycle Couriers, Subculture and Enjoyment'. *The Sociological Review* 55 (2): 189–202. https://doi.org/10.1111/j.1467-954X.2007.00701.x.

Fishman, Elliot, Simon Washington, Narelle Haworth, and Angela Watson. 2015. 'Factors Influencing Bike Share Membership: An Analysis of Melbourne and Brisbane'. *Transportation Research Part A: Policy and Practice* 71 (January): 17–30. https://doi.org/10.1016/j.tra.2014.10.021.

Fol, Sylvie. 2009. *La mobilité des pauvres. Pratiques d'habitants et politiques publiques*. Mappemonde. Paris: Belin.

Foster, Gigi, and Leslie S. Stratton. 2018. 'Do Significant Labor Market Events Change Who Does the Chores? Paid Work, Housework, and Power in Mixed-Gender Australian Households'. *Journal of Population Economics* 31 (2): 483–519. https://doi.org/10.1007/s00148-017-0667-7.

Fox, Kathleen A, Matt R Nobles, and Alex R Piquero. 2009. 'Gender, Crime Victimization and Fear of Crime'. *Security Journal* 22 (1): 24–39. https://doi.org/10.1057/sj.2008.13.

Frère, Bruno, and Marc Jacquemain. 2013. *Résister au quotidien ?* Paris: Presses de Sciences Po.

Fréry, Frédéric, Anne Gratacap, and Thierry Isckia. 2012. 'Les écosystèmes d'affaires, par-delà la métaphore'. *Revue francaise de gestion* 222 (3): 69– 75.

Freudendal-Pedersen, Malene. 2015. 'Whose Commons Are Mobilities Spaces? The Case of Copenhagen Cyclists'. *ACME: An International Journal for Critical Geographies* 14 (2): 598.

Furness, Zach. 2010. *One Less Car, Bicycle and the Politics of Automobility*. Temple University

Press.

Gallez, Caroline. 2015. 'La mobilité quotidienne en politique. Des manières de voir et d'agir'. Dossier d'habilitation à diriger des recherches, Marne-la-Vallée: Université Paris-Est. https://halshs.archives-ouvertes.fr/tel-01261303/.

Gallez, Caroline, Juliette Maulat, Olivier Roy-Baillargeon, and Mariane Thébert. 2015. 'Le rôle des outils de coordination urbanisme-transports collectifs dans la fabrique politique urbaine'. *Flux* 101–102 (3–4): 5–15. https://doi.org/10.3917/flux.101.0005.

Gardner, G. 1998. 'Transport Implications of Leisure Cycling'. *Transport Research Laboratory*.

Geyer, Roland, Jenna R. Jambeck, and Kara Lavender Law. 2017. 'Production, Use, and Fate of All Plastics Ever Made'. *Science Advances* 3 (7): e1700782. https://doi.org/10.1126/sciadv.1700782.

Gibson, James Jerome. 1979. *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.

Gillot, Matthieu, and Patrick Rérat. 2022. 'La « Révolution cycliste plurinationale » de Santiago ou le vélo comme outil de revendications plurielles'. Forum Vies Mobiles, February 2022. https://forumviesmobiles.org/node/15460/printable/print.

Gilow, Marie. 2020. '"It's Work, Physically and Logistically": Analyzing the Daily Mobility of Employed Mothers as Domestic Mobility Work'. *Journal of TransportGeography* 85 (May): 102693. https://doi.org/10.1016/j.jtrangeo.2020.102693.

Giza, Anna. 2021. 'Targeted Society: Should Sociology Theorize Marketing?' *Studia Socjologizne* 4 (243): 83–108.

Götschi, Thomas, Alberto Castro, Manja Deforth, Luis Miranda-Moreno, and Sohail Zangenehpour. 2018. 'Towards a Comprehensive Safety Evaluation of Cycling Infrastructure Including Objective and Subjective Measures'. *Journal of Transport & Health* 8 (March): 44–54. https://doi.org/10.1016/j.jth.2017.12.003.

Graham, Stephen, and Nigel Thrift. 2007. 'Out of Order: Understanding Repair and

Maintenance'. *Theory, Culture & Society* 24 (3): 1–25. https://doi.org/10.1177/0263276407075954.

Gregson, Nicky, Alan Metcalfe, and Louise Crewe. 2009. 'Practices of Object Maintenance and Repair: How Consumers Attend to Consumer Objects within the Home'. *Journal of Consumer Culture* 9 (2): 248–72.

Gronow, Jukka, and Alan Warde. 2001. *Ordinary Consumption*. Psychology Press.

Grosz, Elizabeth. (1993) 2013. 'Bodies and Knowledges: Feminism and the Crisis of Reason'. In *Feminist Epistemologies*, 187–216. Routledge.

Guidez, Jean-Marie, Michel Hubert, and Françoise Mermoud. 2003. 'Le Vélo Dans Les Villes Françaises'. 86. Les Données de l'environnement. Ifen.

Guroff, Margaret. 2018. *The Mechanical Horse: How the Bicycle Reshaped American Life*. Reprint edition. University of Texas Press.

Hadland, Tony, and Hans-Erhard Lessing. 2014. *Bicycle Design: An Illustrated History*. Illustrated, Reprint edition. Cambridge, Massachusetts: The MIT Press.

Hajek, Isabelle. 2021. 'Récup', glanage, zéro déchet : une nouvelle conception du politique ?' *Géocarrefour* 95 (95/1). https://doi.org/10.4000/geocarrefour.16302.

Hamnett, Stephen, and Robert Freestone. 2018. *Planning Metropolitan Australia*. London: Routledge.

Handy, Susan L., Yan Xing, and Theodore J. Buehler. 2010. 'Factors Associated with Bicycle Ownership and Use: A Study of Six Small U.S. Cities'. *Transportation* 37 (6): 967–85. https://doi.org/10.1007/s11116-010-9269-x.

Hannam, Kevin, Mimi Sheller, and John Urry. 2006. 'Editorial: Mobilities, Immobilities and Moorings'. *Mobilities* 1 (1): 1–22. https://doi.org/10.1080/17450100500489189.

Harper, Douglas. 1987. *Working Knowledge: Skill and Community in a Small Shop*. University of Chicago Press.

Hegel, G. W. F. (1807) 2019. *The Phenomenology of Spirit*. Translated by Peter Fuss and John

Dobbins. University of Notre Dame Press.

Heinen, Eva, and Susan Handy. 2012. 'Similarities in Attitudes and Norms and the Effect on Bicycle Commuting: Evidence from the Bicycle Cities Davis and Delft'. *International Journal of Sustainable Transportation* 6 (5): 257–81. https://doi.org/10.1080/15568318.2011.593695.

Henke, Christopher R. 2000. 'The Mechanics of Workplace Order: Toward a Sociology of Repair'. *Berkeley Journal of Sociology* 44: 55–81.

Héran, Frédéric. 1995. 'La Ville Cyclable. Concept, Conditions et Impacts'. *RTS- Recherche Transports Securite* 47: 35–50.

Héran, Frédéric. 2011. *La Ville Morcelée. Effets de Coupure En Milieu Urbain. Méthodes et Approches*. Paris: Economica.

Héran, Frédéric. 2019. 'Aux origines du système vélo, par Frédéric Héran [FUB]'. Blog. Collectif Cycliste 37 (blog). 2019. https://www.cc37.org/aux-origines-du-systeme-velo-par-frederic-heran-fub/.

Herridge, Kristi L., Susan M. Shaw, and Roger C. Mannell. 2003. 'An Exploration of Women's Leisure within Heterosexual Romantic Relationships'. *Journal of Leisure Research* 35 (3): 274–91. https://doi.org/10.1080/00222216.2003.11949994.

Hick, Rod. 2014. 'Poverty as Capability Deprivation: Conceptualising and Measuring Poverty in Contemporary Europe'. *European Journal of Sociology / Archives Européennes de Sociologie* 55 (3): 295–323. https://doi.org/10.1017/S0003975614000150.

Hoor, Maximilian. 2020. 'The Bicycle as a Symbol of Lifestyle, Status and Distinction. A Cultural Studies Analysis of Urban Cycling (Sub)Cultures in Berlin'. *Applied Mobilities* 0(0): 1–18. https://doi.org/10.1080/23800127.2020.1847396.

Hoornweg, Daniel, Perinaz Bhada-Tata, and Chris Kennedy. 2013. 'Environment: Waste Production Must Peak This Century'. *Nature* 502 (7473): 615–17. https://doi.org/10.1038/502615a.

Horton, Dave. 2006. 'Environmentalism and the Bicycle'. *Environmental Politics* 15 (1): 41–58. https://doi.org/10.1080/09644010500418712.

Horton, Dave. 2007. 'Fear of Cycling'. In *Cycling and Society*, edited by Dave Horton, Paul Rosen, and Peter Cox, 133–52. Ashgate Publishing, Ltd.

Hutchby, Ian. 2001. 'Technologies, Texts and Affordances'. *Sociology* 35 (2): 441–56. https://doi.org/10.1017/S0038038501000219.

Illich, Ivan. (1973) 1975. *Tools for Conviviality*. Glasgow: William Collins & co Ltd.

Inckle, Kay. 2019. 'Disabled Cyclists and the Deficit Model of Disability'. Disability Studies Quarterly 39 (4). https://doi.org/10.18061/dsq.v39i4.6513.

Jackson, Steven J. 2013. 'Rethinking Repair'. MIT Press Scholarship.

Jackson, Stevi. 1978. 'The Social Context of Rape: Sexual Scripts and Motivation'. *Women's Studies International Quarterly* 1 (1): 27–38. https://doi.org/10.1016/S0148-0685(78)90311-1.

Jacobs, Jane M., and Stephen Cairns. 2011. 'Ecologies of Dwelling: Maintaining High-Rise Housing in Singapore'. In *The New Blackwell Companion to the City*, 79–95. John Wiley & Sons, Ltd. https://doi.org/10.1002/9781444395105. ch8.

Jeanjean, Agnès. 2009. 'Corps en chantier'. In *Le sujet contre ses objets… tout contre : ethnographies de cultures matérielles*, edited by Marie-Pierre Julien and Céline Rosselin, Editions du comité des travaux historiques et scientifiques. Orientations et méthodes. Paris.

Joncheray, Helene, Marie Level, and Remi Richard. 2016. 'Identity Socialization and Construction within the French National Rugby Union Women's Team'. *International Review for the Sociology of Sport* 51 (2): 162–77. https://doi.org/10.1177/1012690213517108.

Jose, Elizabeth. 2012. 'Strong Women Start on a Bicycle: How Girls-Only Bicycle Empowerment Programs Can Help Urban Girls Grow up to Be Strong Women'. New York: New York

University.

Julien, Marie-Pierre, and Céline Rosselin. 2003. 'C'est en laquant qu'on devient laqueur. De l'efficacité du geste à l'action sur soi'. *Techniques & Culture. Revue semestrielle d'anthropologie des techniques*, no. 40 (April). https://doi.org/10.4000/tc.1454.

Julien, Marie-Pierre, and Céline Rosselin. 2005. *La Culture Matérielle*. La Découverte. Repères Sociologie.

Julien, Marie-Pierre, and Céline Rosselin. 2009. *Le sujet contre les objets… tout contre : ethnographies de cultures matérielles*. Comité des travaux historiques et scientifiques. Orientations et méthodes. Paris.

Kelly, Liz. 1987. 'The Continuum of Sexual Violence'. In *Women, Violence and Social Control*, edited by Jalna Hanmer and Mary Maynard, 46–60. Explorations in Sociology. London: Palgrave Macmillan UK. https://doi.org/10.1007/978-1-349-18592-4_4.

Kelly, Marguerite, Kumiyo Inoue, Alexandra Barratt, Deborah Bateson, Alison Rutherford, and Juliet Richters. 2017. 'Performing (Heterosexual) Femininity: Female Agency and Role in Sexual Life and Contraceptive Use – a Qualitative Study in Australia'. *Culture, Health & Sexuality* 19 (2): 240–55. https://doi.org/10.1080/13691058.2016.1214872.

Kergoat, Danielle. 2000. 'Division Sexuelle Du Travail et Rapports Sociaux de Sexe'. In *Dictionnaire Critique Du Féminisme*, 35–44. Paris: PUF.

Khedira, Hind. 2020. 'Mobilités quotidiennes et numérisation des villes : une information à plusieurs vitesses (Lyon, Rabat)'. Phd thesis, Université de Lyon. https://tel.archives-ouvertes.fr/tel-02918814.

Klawitter, Marieka. 2015. 'Meta-Analysis of the Effects of Sexual Orientation on Earnings'. *Industrial Relations: A Journal of Economy and Society* 54 (1): 4– 32. https://doi.org/10.1111/irel.12075.

Klein, Olivier, Stéphanie Vincent, Emmanuel Ravalet, Adrien Beziat, Yassine Eddarai, Jean-Eric Morain, and Pascal Pochet. 2020. 'Crise sanitaire et mobilité dans la métropole de Lyon et le département du Rhône - Evolution de la répartition modale & focus sur l'usage des TC

et du vélo, Note d'analyse n°1 du projet COVIMOB'. Lyon: LAET. https://halshs.archives-ouvertes.fr/halshs-03193008/document.

Koechlin, Aurore. 2019. *La Révolution féministe*. Editions Amsterdam. Paris, France.

Koenig, Gérard. 2012. 'Le concept d'écosystème d'affaires revisité'. *M@n@gement* 15 (2): 209–24.

Krebs, Stefan. 2012. '"Sobbing, Whining, Rumbling" – Listening to Automobiles as Social Practice'. http://orbilu.uni.lu/handle/10993/21154.

Kroen, Annette, and Robin Goodman. 2012. 'Implementing Metropolitan Strategies: Lessons from Melbourne'. *International Planning Studies* 17 (3): 303–21. https://doi.org/10.1080/13563475.2012.696474.

Kurnicki, Karol. 2022. 'What Do Cars Do When They Are Parked? Material Objects and Infrastructuring in Social Practices'. *Mobilities* 17 (1): 37–52. https://doi.org/10.1080/17450101.2021.1981538.

Laet, Marianne de, and Annemarie Mol. 2000. 'The Zimbabwe Bush Pump: Mechanics of a Fluid Technology'. *Social Studies of Science* 30 (2): 225–63. https://doi.org/10.1177/030631200030002002.

Lagadic, Marion. 2022. 'Cycling for All? A Feminist Analysis of the Tokyo Bicycle Utilisation Promotion Strategy.' https://hal.archives-ouvertes.fr/hal-03683676/document.

Lahieyte, Lilian. 2020. 'Sociologie et mesure de la pauvreté'. *Revue francaise de sociologie* Vol. 61 (2): 275–80.

Laker, Laura. 2018. 'Inspiring Change'. BikeBiz, July 2018.

Larsen, Jonas. 2017. 'Bicycle Parking and Locking: Ethnography of Designs and Practices'. *Mobilities* 12 (1): 53–75. https://doi.org/10.1080/17450101.2014.993534.

Larsen, Jonas, and Mathilde Dissing Christensen. 2015. 'The Unstable Lives of Bicycles: The "Unbecoming" of Design Objects'. *Environment and Planning A* 47 (4): 922–38. https://doi.org/10.1068/a140282p.

Latour, Bruno. 2000. 'When Things Strike Back: A Possible Contribution of "Science Studies" to the Social Sciences'. *The British Journal of Sociology* 51 (1): 107– 23. https://doi.org/10.1111/j.1468-4446.2000.00107.x.

Le Gouic, Olivier. 2019. 'Les Lyonnais et l'aventure Coloniale'. In *Lyon et La Mer Au XVIIIe Siècle : Connexions Atlantiques et Commerce Colonial*, 237–71. Histoire. Rennes: Presses universitaires de Rennes. http://books.openedition.org/pur/111213.

Leitner, Helga, Jamie Peck, and Eric S. Sheppard. 2007. *Contesting Neoliberalism: Urban Frontiers*. Guilford Press.

Lewis, Miles. 1999. *Suburban Backlash: The Battle for the World's Most Liveable City*. Bloomings Books.

Libaert, Thierry. 2015. 'Consommation et controverse : le cas de l'obsolescence programmée'. *Hermes, La Revue* n° 73 (3): 151–58.

Malochet, Guillaume. 2007. 'La féminisation des métiers et des professions. Quand la sociologie du travail croise le genre'. *Sociologies pratiques* 14 (1): 91–99. https://doi.org/10.3917/sopr.014.0091.

Marcus, George E. 1995. 'Ethnography in/of the World System: The Emergence of Multi-Sited Ethnography'. *Annual Review of Anthropology* 24 (1): 95–117. https://doi.org/10.1146/annurev.an.24.100195.000523.

Mari, Carlo. 2021. *A Business History of the Bicycle Industry: Shaping Marketing Practices*. Springer International Publishing.

Marincek, Dimitri. 2021. 'The Role of Key Events, Motivations and Past Experiences in the Adoption of the E-Bike'. In *Becoming Urban Cyclists: From Socialization to Skills*, Matthieu Adam, Nathalie Ortar. Chester: Chester University Press.

Marks, Nicholas. 2021. 'When the Wheels Come off: Actor-Network Therapy for Mental Health Recovery in the Bicycle Repair Workshop'. *Sociology of Health & Illness* 43 (7): 1700–1719. https://doi.org/10.1111/1467-9566.13357.

Martínez, Francisco. 2019. 'Insiders' Manual to Breakdown'. In *Repair, Brokenness, Breakthrough: Ethnographic Responses*, by Francisco Martínez and Patrick Laviolette, 1–16. Berghahn Books.

Marx, K. (1867) 2013. *Capital*. Ware: Wordsworth.

Massey, Doreen. 1994. *Space, Place and Gender*. John Wiley & Sons.

Masters, R. S. W. 1992. 'Knowledge, Knerves and Know-How: The Role of Explicit versus Implicit Knowledge in the Breakdown of a Complex Motor Skill under Pressure'. *British Journal of Psychology* 83 (3): 343–58. https://doi.org/10.1111/j.2044-8295.1992.tb02446.x.

Mauss, Marcel. 1934. 'Les Techniques Du Corps'. *Journal de Psychologie* XXXII.

Mauss, Marcel. (1924) 2012. *Essai sur le don*. Paris: Presses Universitaires de France.

McCracken, Clare. 2020. 'Snowman Killer: Art, Spatial Relations & the Mobilities Turn'. Melbourne: RMIT University. https://researchrepository.rmit.edu.au/esploro/outputs/doctoral/Snowman-Killer-art-spatial-relations--the-Mobilities-turn/9921893407901341.

McGinnis, Lee, Julia McQuillan, and Constance L. Chapple. 2005. 'I Just Want to Play: Women, Sexism, and Persistence in Golf'. *Journal of Sport and Social Issues* 29 (3): 313–37. https://doi.org/10.1177/0193723504272659.

Mené, Noémi. 2019. 'Apprentissages, Transmissions, Réaffirmations : La Mécanique et Au-Delà Dans Les Ateliers d'autoréparation de Vélo'. Mémoire, Lyon: Université de Lyon.

Mennesson, Christine. 2004. 'Être une femme dans un sport « masculin ». Modes de socialisation et construction des dispositions sexuées'. *Sociétés contemporaines* 55 (3): 69–90. https://doi.org/10.3917/soco.055.0069.

Mennesson, Christine. 2011. 'Socialisation familiale et investissement des filles et des garçons dans les pratiques culturelles et sportives associatives'. *Réseaux* 168–169 (4–5): 87–110. https://doi.org/10.3917/res.168.0087.

Mercat, Nicolas. 2009. 'Spécial Économie Du Vélo : Étude Complète'. Atout France.

https://www.au5v.fr/IMG/pdf/rapport_economie_du_velo_-_altermodal.pdf.

Merleau-Ponty, Maurice. 1976. *Phénoménologie de la perception*. Paris: Gallimard.

Middleton, Jonnet. 2018. 'Mending the Sensible: Ontoexperiments for a Politics of Matter'. PhD thesis, Lancaster: Lancaster University. https://www.proquest.com/openview/c9043671ff8650dd43225fb967a00 5ce/1?pq-origsite=gscholar&cbl=18750&diss=y.

Mikkola, Juliana Hsuan. 2002. 'Industry Structure and Modular Product Architectures: An Interpretation of the Bicycle Industry'. The 9th International Annual EurOMA Conference.

Millepied, Anne-Charlotte. 2018. 'Le pouvoir des mots et des corps. L'autodéfense féministe, lieu de production de scripts sexuels alternatifs'. Itinéraires. *Littérature, textes, cultures*, no. 2017–2 (March). https://doi.org/10.4000/itineraires.3818.

Miller, Daniel. 1987. *Material Culture and Mass Consumption*. Blackwell.

Miller, Daniel. 2001. *Car Cultures*. Berg Publishers. http://discovery.ucl.ac.uk/117850/.

Milligan, Lizzi. 2016. 'Insider-Outsider-Inbetweener? Researcher Positioning, Participative Methods and Cross-Cultural Educational Research'. *Compare: A Journal of Comparative and International Education* 46 (2): 235–50. https://doi.org/10.1080/03057925.2014.928510.

Miranda, Veerle. 2011. 'Cooking, Caring and Volunteering: Unpaid Work Around the World'. Paris: OCDE. https://doi.org/10.1787/5kghrjm8s142-en.

Mom, Gijs. 2014. *Atlantic Automobilism: Emergence and Persistence of the Car*, 1895-1940. Berghahn Books.

Monjaret, Anne. 2020. *La Pin-up à l'atelier. Ethnographie d'un rapport de genre*. Créaphis Éditions. https://hal.archives-ouvertes.fr/hal-03065379.

Moore, James F. 1993. 'Predators and Prey: A New Ecology of Competition'. *Harvard Business Review*, May. https://hbr.org/1993/05/predators-and-prey-a-new-ecology-of-competition.

Moreton-Robinson, Aileen. 2003. 'I Still Call Australia Home: Indigenous Belonging and Place in a White Postcolonizing Society'. In *Uprootings/Regroundings Questions of Home and Migration*. Routledge.

Morgan, D. L. 2007. 'Paradigms Lost and Pragmatism Regained: Methodological Implications of Combining Qualitative and Quantitative Methods'. *Journal of Mixed Methods Research* 1 (1): 48–76. https://doi.org/10.1177/2345678906292462.

Morris, Barry. 2014. *Protests, Land Rights, and Riots: Postcolonial Struggles in Australia in the 1980s*. Berghahn Books.

Mosconi, Nicole, and Rosine Dahl-Lanotte. 2003. 'C'est technique, est-ce pour elles ?' *Travail, genre et societes* N° 9 (1): 71–90.

Müggenburg, Hannah, Annika Busch-Geertsema, and Martin Lanzendorf. 2015. 'Mobility Biographies: A Review of Achievements and Challenges of the Mobility Biographies Approach and a Framework for Further Research'. *Journal of Transport Geography* 46 (June): 151–63. https://doi.org/10.1016/j.jtrangeo.2015.06.004.

Mukerji, Chandra. 2015. 'The Material Turn'. In *Emerging Trends in the Social and Behavioral Sciences*, 1–13. American Cancer Society. https://doi.org/10.1002/9781118900772.etrds0109.

Mundler, Marie, and Patrick Rerat. 2018. 'Le Vélo Comme Outil d'empowerment - Les Impacts Des Cours de Vélo Pour Adultes Sur Les Pratiques Socio-Spatiales'. *Les Cahiers Scientifiques Du Transport*, no. 73: 139–60.

Munro, Cameron. 2019. 'Victorian Cycling Participation 2019'. AP-C91-19 (VIC). Sydney: Austroads.

Nagar, Richa. 2013. 'Storytelling and Co-Authorship in Feminist Alliance Work: Reflections from a Journey'. *Gender, Place & Culture* 20 (1): 1–18. https://doi.org/10.1080/0966369X.2012.731383.

Naji, Myriem. 2009. 'La formation de féminités à travers le tissage dans le Sirwa (Maroc)'. In *Le sujet contre ses objets… tout contre : ethnographies de cultures matérielles*, edited by

Marie-Pierre Julien and Céline Rosselin, Editions du comité des travaux historiques et scientifiques. Orientations et méthodes. Paris.

Nello-Deakin, Samuel. 2020. 'Environmental Determinants of Cycling: Not Seeing the Forest for the Trees?' *Journal of Transport Geography* 85 (May): 102704. https://doi.org/10.1016/j.jtrangeo.2020.102704.

Nobis, Claudia. 2019. 'Mobilität in Deutschland - Analysen zum Radverkehr und Fußverkehr'. Bundesministerium für Verkehr und digitale Infrastruktur. https://elib.dlr.de/133559/1/MiD2017_Analyse_zum_Rad_und_Fussverkehr. pdf.

Octobre, Sylvie. 2005. 'La Fabrique Sexuée Des Goûts Culturels : Construire Son Identité de Fille Ou de Garçon à Travers Les Activités Culturelles'. *La Fabrique Sexuée Des Goûts Culturels : Construire Son Identité de Fille Ou de Garçon à Travers Les Activités Culturelles*, no. 150: 1–10.

Oddy, Nicholas. 2018. 'History, Tweed and the Invisible Bicycle'. In *Invisible Bicycle: Parallel Histories and Different Timelines*, 215–32. Brill. https://brill.com/view/title/27251.

Oja, P., S. Titze, A. Bauman, B. de Geus, P. Krenn, B. Reger-Nash, and T. Kohlberger. 2011. 'Health Benefits of Cycling: A Systematic Review'. *Scandinavian Journal of Medicine & Science in Sports* 21 (4): 496–509. https://doi.org/10.1111/j.1600-0838.2011.01299.x.

Oke, Olufolajimi, Kavi Bhalla, David C. Love, and Sauleh Siddiqui. 2015. 'Tracking Global Bicycle Ownership Patterns'. *Journal of Transport & Health* 2 (4): 490–501. https://doi.org/10.1016/j.jth.2015.08.006.

Orfeuil, Jean-Pierre. 2010. 'La mobilité, nouvelle question sociale ?' *SociologieS*, December. http://journals.openedition.org/sociologies/3321.

Oroza, Ernesto. 2009. Rikimbili. Une Étude Sur La Désobéisance Technologique et Quelques Formes de Réinvention. Cité du design. Saint-Étienne.

Orr, J. E. 1996. *Talking about Machines: An Ethnography of a Modern Job*. Cornell University Press. http://stuartgeiger.com/posts/2008/11/review-talking-about-machines-by-julian-orr/.

Ortar, Nathalie. 2019. 'What the E-Bike Tells Us about the Anthropology of Energy'. In *Electrifying Anthropology: Exploring Electrical Practices and Infrastructures*, edited by Simone Abram, Brit Ross Winthereik, and Thomas Yarrow, 83–99. London: Bloomsbury academics.

Papon, Francis, Leslie Belton Chevallier, Sylvie Abours, Etienne Come, Sophie Midenet, Claude Soulas, Jean Marie Beauvais, and Nadine Polombo. 2016. 'L'intermodalité vélo-train : une évaluation socio-économique des bénéfices', December. https://halshs.archives-ouvertes.fr/halshs-01424765.

Papon, Francis, and Régis De Solère. 2010. 'Les Modes Actifs : Marche et Vélo de Retour En Ville'. Paris: Commissariat général au développement durable.

Papon, Francis, and Clément Dusong. 2016. 'Bilan Positif de La Pratique Du Vélo - Santé et Environnement'. In Séminaire Sur La Mobilité Soutenable Comparative Mexique - France, 19p. Puebla, Mexico. https://hal.archives-ouvertes.fr/hal-01455380.

Papuchon, Adrien, and Nicolas Duvoux. 2018. 'Qui Se Sent Pauvre En France: Pauvreté Subjective et Insécurité Sociale (Who Feels Poor in France? Subjective Poverty and Social Insecurity)'. *Revue Française de Sociologie* 59 (4): 607–47. https://doi.org/10.3917/rfs.594.0607.

Parkin, John, Tim Ryley, and Tim Jones. 2016. 'Barriers to Cycling: An Exploration of Quantitative Analyses'. In *Cycling and Society*, 67–82. Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9781315575735-9/barriers-cycling-exploration-quantitative-analyses-john-parkin-tim-ryley-tim-jones.

Peck, Jamie. 2015. 'Cities beyond Compare?' *Regional Studies* 49 (1): 160–82. https://doi.org/10.1080/00343404.2014.980801.

Pellegrin-Boucher, Estelle, and Gaël Gueguen. 2005. 'Stratégies de « coopétition » Au Sein d'un Écosystème d'affaires : Une Illustration à Travers Le Cas de SAP'. *Finance Contrôle Stratégie* 8 (1).

Piketty, Thomas. 2013. *Le Capital au XXIe siècle*. Média Diffusion.

'Plan Vélo et Mobilités Actives'. 2018. Ministère de la transition écologique et solidaire.

Pons, Anne, Timothé Kolmer, Jessica Berlet, Hyacinthe Blaise, Robin Prémaillon, Anna Trentini, and Benoît Vimbert. 2019. 'Enquête Mobilités 2019: Résultats Essentiels'. Strasbourg: Agence de développement et d'urbanisme de l'agglomération strasbourgeoise. https://www.adeus.org/wp-content/uploads/12751_file_rapport_ema_resultats-essentiels-1.pdf.

Pontille, David, and Jérôme Denis. 2010. *Petite sociologie de la signalétique: Les coulisses des panneaux du métro*. Presses des Mines.

Popan, Cosmin. 2019. *Bicycle Utopias: Imagining Fast and Slow Cycling Futures*. Routledge.

Presland, Gary. 1994. *Aboriginal Melbourne: The Lost Land of the Kulin People*. Ringwood, Vic: McPhee Gribble.

Pucher, John, and Ralph Buehler. 2008. 'Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany'. *Transport Reviews* 28 (4): 495– 528. https://doi.org/10.1080/01441640701806612.

Pucher, John, Jan Garrard, and Stephen Greaves. 2011. 'Cycling down under: A Comparative Analysis of Bicycling Trends and Policies in Sydney and Melbourne'. *Journal of Transport Geography* 19 (2): 332–45. https://doi.org/10.1016/j.jtrangeo.2010.02.007.

Raibaud, Yves. 2015. 'Durable, mais inégalitaire : la ville'. *Travail, genre et societes* 33 (1): 29–47.

Rajé, Fiona, and Andrew Saffrey. 2016. 'The Value of Cycling'. Report. University of Birmingham; Phil Jones Associates. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/509587/value-of-cycling.pdf.

Randell, Richard. 2020. 'No Paradigm to Mobilize: The New Mobilities Paradigm Is Not a Paradigm'. *Applied Mobilities* 5 (2): 206–23. https://doi.org/10.1080/23800127.2018.1493063.

Reckwitz, Andreas. 2002. 'Toward a Theory of Social Practices: A Development in Culturalist

Theorizing'. *European Journal of Social Theory* 5 (2): 243–63. https://doi.org/10.1177/13684310222225432.

Remaud, Olivier, Jean-Frédéric Schaub, and Isabelle Thireau, eds. 2012. 'Introduction'. In *Faire des sciences sociales. Comparer*, 13–20. Aubervilliers: Éditions de l'École des hautes études en sciences sociales.

Rich, Adrienne. 1981. 'La Contrainte à l'hétérosexualité et l'existence Lesbienne'. *Nouvelles Questions Féministes*, no. 1: 15–43.

Richards, Christina, Walter Pierre Bouman, Leighton Seal, Meg John Barker, Timo O. Nieder, and Guy T'Sjoen. 2016. 'Non-Binary or Genderqueer Genders'. *International Review of Psychiatry* 28 (1): 95–102. https://doi.org/10.3109/09540261.2015.1106446.

Rigal, Alexandre. 2019. 'Les ateliers vélo : fabriques d'autonomie et de modes de vie ?' Forum vies mobiles. 2019. http://fr.forumviesmobiles.org/projet/2019/08/27/ateliers-velo-fabriques-dautonomie-et-modes-vie-13013.

Rigal, Alexandre. 2020. 'Changer la vie dans un atelier d'autoréparation de vélo'. Synthèse de recherche. Forum Vies Mobiles. https://infoscience.epfl.ch/record/274356.

Rigal, Alexandre. 2022. 'Changing Habits in the Cycling Subculture: The Case of Two Bike Workshops in France'. *Mobilities* 0 (0): 1–18. https://doi.org/10.1080/17450101.2022.2071630.

Robinson, Jennifer. 2006. *Ordinary Cities: Between Modernity and Development*. London: Routledge. https://doi.org/10.4324/9780203506554.

Rommes, Els. 2002. 'Gender scripts and the internet; The design and use of Amserdam's Digital City'. Twente University Press (TUP). https://research.utwente.nl/en/publications/gender-scripts-and-the-internet-the-design-and-use-of-amserdams-digital-city(fb0dba64-3101-4539-8a70-cd7f23d91ba8).html.

Rosen, Paul. 1993. 'The Social Construction of Mountain Bikes: Technology and Postmodernity in the Cycle Industry'. *Social Studies of Science* 23 (3): 479– 513.

Rosner, Daniela K., and Morgan Ames. 2014. 'Designing for Repair? Infrastructures and Materialities of Breakdown'. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing*, 319–31. CSCW '14. New York, NY, USA: Association for Computing Machinery. https://doi.org/10.1145/2531602.2531692.

Rousseau, Max. 2017. 'La densité fait-elle la mixité ? Politiques de densification et inégalités territoriales dans l'agglomération de Lyon'. *Sociétés contemporaines* 107 (3): 23–50. https://doi.org/10.3917/soco.107.0023.

Roux, Alexandra. 2021. 'Sociologie de la contraception en France'. *Médecine/sciences* 37 (6–7): 647–53. https://doi.org/10.1051/medsci/2021093.

Roy, Ananya. 2011. 'The 21st-Century Metropolis: New Geographies of Theory'. In *The Futures of the City Region*. Routledge.

Roy, Papon, Md. Danesh Miah, and Md. Tasneem Zafar. 2019. 'Environmental Impacts of Bicycle Production in Bangladesh: A Cradle-to-Grave Life Cycle Assessment Approach'. *SN Applied Sciences* 1 (7): 700. https://doi.org/10.1007/s42452-019-0721-z.

Sahakian, Marlyne, Laurence Gaudin, and Irène Courtin. 2020. 'Promoting 'pro', 'low', and 'no' meat consumption in Switzerland: The role of emotions in practices'. *Appetite* 150.

Sahakian, Marlyne, and Harold Wilhite. 2014. 'Making practice theory practicable: Towards more sustainable forms of consumption'. *Journal of Consumer Culture* 14 (1): 25–44.

Sayagh, David. 2018. 'Pourquoi Les Adolescentes Ont Moins de Possibilités Réelles de Faire Du Vélo Que Les Adolescents'. Thesis, Paris Est. http://www.theses.fr/2018PESC1090.

Schepers, Paul, Marco Helbich, Marjan Hagenzieker, Bas de Geus, Marco Dozza, Niels Agerholm, Anna Niska, Noora Airaksinen, Francis Papon, Regine Gerike, Torkel Bjørnskau, and Rachel Aldred. 2021. 'The development of cycling in European countries since 1990'. *European Journal of Transport and Infrastructure Research* 21(2): 41-70

Schor, Juliet. 2010. *Plenitude: The New Economics of True Wealth*. Penguin Press.

Schwartz, Olivier. 2002. *Le monde privé des ouvriers: hommes et femmes du Nord*. Paris,

France: PUF.

Sheller, Mimi. 2018. *Mobility Justice: The Politics of Movement in an Age of Extremes*. London ; Brooklyn, NY: Verso.

Sheller, Mimi, and John Urry. 2016. 'Mobilizing the New Mobilities Paradigm'. *Applied Mobilities* 1 (1): 10–25. https://doi.org/10.1080/23800127.2016.1151216.

Sheppard, Eric, Helga Leitner, and Anant Maringanti. 2013. 'Provincializing Global Urbanism: A Manifesto'. *Urban Geography* 34 (7): 893–900. https://doi.org/10.1080/02723638.2013.807977.

Shove, Elizabeth, and Mika Pantzar. 2005. 'Consumers, Producers and Practices: Understanding the Invention and Reinvention of Nordic Walking'. *Journal of Consumer Culture* 5 (1): 43–64. https://doi.org/10.1177/1469540505049846.

Shove, Elizabeth, Mika Pantzar, and Matt Watson. 2012. *The Dynamics of Social Practice: Everyday Life and How It Changes*. SAGE.

Shove, Elizabeth, and Alan Warde. 2001. 'Inonspicuous Consumption: The Sociology of Consumption, Lifestyles, and the Environment'. In *Sociological Theory and the Environment: Classical Foundations, Contemporary Insights*, edited by Riley E. Dunlap, Frederick H. Buttel, Peter Dickens, and August Gijswijt, 230–51. United States: Rowman & Littlefield Publishers.

Simmel, Georg. (1900) 2011. *The Philosophy of Money*. 1st Edition. Abingdon, Oxon ; New York: Routledge.

Smith, Louisa. 2013a. 'Working Hard with Gender: Gendered Labour for Women in Male Dominated Occupations of Manual Trades and Information Technology (IT)'. Text. Emerald Group Publishing Limited. 2013. https://doi.org/info:doi/10.1108/EDI-12-2012-0116.

Smith, Louisa. 2013b. 'Trading in Gender for Women in Trades: Embodying Hegemonic Masculinity, Femininity and Being a Gender Hotrod'. *Construction Management and Economics* 31 (8): 861–73. https://doi.org/10.1080/01446193.2013.833339.

Spinney, Justin. 2006. 'A Place of Sense: A Kinaesthetic Ethnography of Cyclists on Mont Ventoux'. *Environment and Planning D: Society and Space* 24 (5): 709–32. https://doi.org/10.1068/d66j.

Spinney, Justin. 2009. 'Cycling the City: Movement, Meaning and Method'. *Geography Compass* 3 (2): 817–35. https://doi.org/10.1111/j.1749-8198.2008.00211.x.

Spinney, Justin, and Wen-I Lin. 2019. '(Mobility) Fixing the Taiwanese Bicycle Industry: The Production and Economisation of Cycling Culture in Pursuit of Accumulation'. *Mobilities* 14 (4): 524–44. https://doi.org/10.1080/17450101.2019.1580003.

Spinney, Justin, Suzanne Reimer, and Philip Pinch. 2017. 'Introduction'. In *Mobilising Design*, 1–9. Routledge.

Spotswood, Fiona, Tim Chatterton, Alan Tapp, and David Williams. 2015. 'Analysing Cycling as a Social Practice: An Empirical Grounding for Behaviour Change'. *Transportation Research Part F: Traffic Psychology and Behaviour* 29 (February): 22–33. https://doi.org/10.1016/j.trf.2014.12.001.

Star, Susan Leigh. 1999. 'The Ethnography of Infrastructure'. *American Behavioral Scientist* 43 (3): 377–91. https://doi.org/10.1177/00027649921955326.

Stark, David. 2009. *The Sense of Dissonance: Accounts of Worth in Economic Life*. Princeton University Press. https://doi.org/10.1515/9781400831005.

Steg, Linda. 2005. 'Car Use: Lust and Must. Instrumental, Symbolic and Affective Motives for Car Use'. *Transportation Research Part A: Policy and Practice, Positive Utility of Travel*, 39 (2): 147–62. https://doi.org/10.1016/j.tra.2004.07.001.

Stehlin, John G. 2019. *Cyclescapes of the Unequal City: Bicycle Infrastructure and Uneven Development*. U of Minnesota Press.

Straume, Ingerid S. 2013. 'Castoriadis, Education and Democracy'. In *Creation, Rationality and Autonomy: Essays on Cornelius Castoriadis*, edited by Giorgio Baruchello and Ingerid S. Straume, NSU Press, 203–28.

Strebel, Ignaz. 2011. 'The Living Building: Towards a Geography of Maintenance Work'. *Social & Cultural Geography* 12 (3): 243–62. https://doi.org/10.1080/14649365.2011.564732.

Strebel, Ignaz, Alain Bovet, and Philippe Sormani, eds. 2019. *Repair Work Ethnographies: Revisiting Breakdown, Relocating Materiality*. Singapore: Springer. https://doi.org/10.1007/978-981-13-2110-8_10.

Strobel, Pierre. 1996. 'From Poverty to Exclusion: A Wage-Earning Society or a Society of Human Rights?' *International Social Science Journal* 48 (148): 173– 89. https://doi.org/10.1111/j.1468-2451.1996.tb00071.x.

Strömberg, Helena, and I.C. MariAnne Karlsson. 2016. 'Enhancing Utilitarian Cycling: A Case Study'. *Transportation Research Procedia* 14: 2352–61. https://doi.org/10.1016/j.trpro.2016.05.264.

Tabet, Paola. 1979. 'Les Mains, les outils, les armes'. *Homme* 19 (3): 5–61. https://doi.org/10.3406/hom.1979.367998.

Tashakkori, Abbas, and John W. Cresswell. 2007. 'The New Era of Mixed Methods'. *Journal of Mixed Methods Research* 1 (1): 3–7. https://doi.org/10.1177/1558689806293042.

Tashakkori, Abbas, and Charles Teddlie. 2003. 'Major Issues and Controversies in the Use of Mixed Methods in the Social and Behavioral Sciences'. In *Handbook of Mixed Methods in Social & Behavioral Research*, Tashakkori and Teddlie. SAGE.

Thompson, Laura. 2018. '"I Can Be Your Tinder Nightmare": Harassment and Misogyny in the Online Sexual Marketplace'. *Feminism & Psychology* 28 (1): 69–89. https://doi.org/10.1177/0959353517720226.

Ting, Shun, Francisco Perales, and Janeen Baxter. 2016. 'Gender, Ethnicity and the Division of Household Labour within Heterosexual Couples in Australia'. *Journal of Sociology* 52 (4): 693–710. https://doi.org/10.1177/1440783315579527.

Tironi, Martin. 2019. 'Inquiring and Experimenting with Urban Ecology: Pragmatist Lessons from

Public Bicycle Repair'. In *Repair Work Ethnographies: Revisiting Breakdown, Relocating Materiality*, edited by Ignaz Strebel, Alain Bovet, and Philippe Sormani, 187–219. Singapore: Springer. https://doi.org/10.1007/978-981-13-2110-8_10.

Tissot, Sylvie. 2014. 'Entre soi et les autres'. *Actes de la recherche en sciences sociales* 204 (4): 4–9. https://doi.org/10.3917/arss.204.0004.

Urry, John. 2004. 'The "System" of Automobility'. *Theory, Culture & Society* 21 (4– 5): 25–39. https://doi.org/10.1177/0263276404046059.

Urry, John. 2006. 'Inhabiting the Car'. *The Sociological Review* 54 (s1): 17–31. https://doi.org/10.1111/j.1467-954X.2006.00635.x.

Veblen, Thorstein B. 1899. *The Theory of the Leisure Class: An Economic Study in the Evolution of Institutions*. The Macmillan Company.

Veenstra, Aleit, and Giselinde Kuipers. 2013. 'It Is Not Old-Fashioned, It Is Vintage, Vintage Fashion and The Complexities of 21st Century Consumption Practices'. *Sociology Compass* 7 (5): 355–65. https://doi.org/10.1111/soc4.12033.

'Victorian Integrated Survey of Travel and Activity'. 2016. Melbourne, Victoria: Department of Transport. https://transport.vic.gov.au/about/data-and-research/vista.

Vivanco, Luis A. 2013. *Reconsidering the Bicycle: An Anthropological Perspective on a New (Old) Thing*. Routledge.

Wajcman, Judy. 2010. 'Feminist Theories of Technology'. *Cambridge Journal of Economics* 34 (1): 143–52. https://doi.org/10.1093/cje/ben057.

Wallace, Jean E., and Marisa C. Young. 2010. 'Work Hard, Play Hard?: A Comparison of Male and Female Lawyers' Time in Paid and Unpaid Work and Participation in Leisure Activities'. *Canadian Review of Sociology/Revue Canadienne de Sociologie* 47 (1): 27–47. https://doi.org/10.1111/j.1755-618X.2010.01221.x.

Warde, Alan. 2005. 'Consumption and Theories of Practice'. *Journal of Consumer Culture* 5 (2): 131–53. https://doi.org/10.1177/1469540505053090.

Warde, Alan. 2014. 'After Taste: Culture, Consumption and Theories of Practice'. *Journal of Consumer Culture* 14 (3): 279–303. https://doi.org/10.1177/1469540514547828.

Warde, Alan. 2015. 'The Sociology of Consumption: Its Recent Development'. *Annual Review of Sociology* 41 (1): 117–34. https://doi.org/10.1146/annurev-soc-071913-043208.

Warnier, Jean-Pierre. 1999. *Construire la culture matérielle*. Presses Universitaires de France. https://doi.org/10.3917/puf.warni.1999.01.

Watson, Rod. 2006. 'Tacit Knowledge'. *Theory, Culture & Society* 23 (2–3): 208–10. https://doi.org/10.1177/026327640602300244.

Whitwham, Marguerite, and Gabrielle Trebesses. 2016. 'Étude Relative à La Perception Des Réparateurs Sur Leur Activité et Les Possibles Évolutions de Cette Activité'. ADEME, Philgea, Moringa.

Wilson, David Gordon, and Theodor Schmidt. 2020. *Bicycling Science*. 4th ed. Cambridge, MA, USA: MIT Press.

Wilson, N. G., and M. Hirst. 1994. 'The Bicycle Component Industry'. In *Managing Strategic Action: Mobilizing Change Concepts, Readings and Cases*, by Cynthia Hardy, 428–40. SAGE Publications.

Wittig, Monique. 1992. *The Straight Mind: And Other Essays*. 1st edition. Boston: Beacon Press.

Wolcott, Harry F. 2004. 'The Ethnographic Autobiography'. *Auto / Biography* 12 (2): 93–106. https://doi.org/10.1191/0967550704ab004oa.

Yaneva, Albena. 2009. 'Making the Social Hold: Towards an Actor-Network Theory of Design'. *Design and Culture* 1 (3): 273–88. https://doi.org/10.1080/17547075.2009.11643291.

Young, Iris Marion. 1980. 'Throwing like a Girl: A Phenomenology of Feminine Body Comportment Motility and Spatiality'. *Human Studies* 3 (1): 137–56. https://doi.org/10.1007/BF02331805.

Résumé de la Thèse en Français

Cette thèse, intitulée Vélonomie et matérialité des mobilités : Pratiques de mécanique vélo à Lyon, France et Melbourne, Australie porte sur les pratiques de mécanique vélo, et plus spécifiquement de réparation et d'entretien de cycles. Elle repose sur une étude comparative dans les villes de Lyon (France) et Melbourne (Australie).

Introduction

La mécanique vélo est rarement un objet d'attention académique ou politique. Pourtant, il s'agit d'un phénomène indissociable des pratiques cyclistes, notamment lorsqu'elles s'inscrivent dans la durée.

Les enjeux de la mécanique vélo sont nombreux : tout d'abord, la grande majorité des métropoles mondiales, et notamment Lyon et Melbourne, affichent l'intention de développer la part modale du vélo. Cependant, cela n'est possible que si les vélos dont disposent les potentiel-les cyclistes sont en bon état. Les pratiques mécaniques constituent, au même titre que les infrastructures cyclables ou que les politiques liées au stationnement des vélos, un élément essentiel du « système vélo ».

Un autre enjeu des pratiques mécaniques est lié à la question des déchets et de l'impact écologiques des mobilités. L'empreinte écologique du vélo est faible, notamment par comparaison avec celle de la voiture. Cependant, elle dépend de nombreux facteurs, et en particulier de la durée de vie du véhicule. La question de la réparation joue donc un rôle important dans l'impact écologique des pratiques cyclistes.

Un troisième enjeu de la mécanique vélo concerne le rapport aux objets. La réparation, comme le cyclisme, sont des pratiques matérielles qui requièrent des compétences et savoir-faire, et engagent les sens d'une manière complexe.

Jusqu'à présent, les sciences sociales n'ont pas abordé le sujet de la réparation de vélos en

détail. La majorité des travaux portant sur ce sujet se concentre sur les ateliers d'auto-réparation, au moyen d'études de cas réalisées dans un ou plusieurs de ces ateliers. Les autres formes de pratiques de mécanique vélo, telles que le recours au service d'un-e vélociste, la réparation amateure à domicile, ou encore l'absence de réparation, ne sont pas abordées. Il n'existe aucune recherche sur la manière dont les cyclistes appréhendent ces différentes formes de réparation dans leur vie quotidienne. Par ailleurs, les études sur les pratiques de réparation vélo sont rarement associées à une réflexion sur le contexte socio-économique dans lequel celles-ci s'inscrivent.

Cette thèse entend remédier à ces manques en répondant à la question suivante : Quelles sont les conditions permettant aux cyclistes urbains de devenir autonomes dans leurs pratiques de déplacements et de réparation ?

Cette question s'organise elle-même autour de trois axes : la description et la caractérisation des pratiques de réparation cycle ; le lien entre les pratiques cyclistes et mécaniques ; les expériences différenciées de la mécanique vélo en fonction de facteurs socio-économiques et d'un environnement urbain donné.

Cette recherche se développe sur cinq chapitres : le premier présente les méthodes employées ; le deuxième décrit les pratiques de réparation ; le troisième porte sur la relation cycliste-vélo ; le quatrième sur le lien entre pratiques de réparation et société de consommation ; et le dernier sur les pratiques genrées de réparation.

Chapitre I - Méthodologie

Le premier chapitre de cette thèse décrit la méthode employée pour mener à bien cette enquête, ainsi que les cas étudiés durant celle-ci. Il se divise en trois sections qui abordent respectivement la comparaison internationale, l'usage des méthodes mixtes, l'approche ethnographique et la perspective située de la chercheuse.

Dans cette thèse, j'ai fait le choix de comparer les villes de Lyon et Melbourne. L'approche comparative permet d'identifier des phénomènes difficiles à cerner dans le cadre d'une

monographie. La comparaison s'intéresse particulièrement aux différences observées entre les deux villes : d'un côté, Melbourne est une ville étalée où la domination culturelle de la voiture est plus marquée, ainsi que la pratique du vélo sportif. D'un autre côté, Lyon est une ville dense qui compte un système de vélo en libre-service très populaire. Le marché du vélo d'occasion y est plus développé, de même que les ateliers d'auto-réparation.

J'ai également fait le choix d'utiliser des méthodes mixtes en articulant des méthodes quantitatives et qualitatives. Ce choix est adapté à l'interdisciplinarité des approches théoriques employées, ainsi qu'aux différentes échelles d'interprétation mobilisées. Les deux méthodes principales de cette thèse sont, d'une part un questionnaire portant sur les pratiques de réparation, et d'autre part des entretiens semi-directifs. Le questionnaire a été complété par plus de 450 cyclistes dans chaque ville, tandis que les entretiens ont été réalisés auprès de 35 cyclistes, 23 bénévoles d'ateliers associatifs, et 38 mécanicien-nes professionnel-les. J'ai donc adopté une recherche multi-sites en visitant 44 espaces de réparation répartis dans les deux villes.

Enfin, j'ai fait le choix d'adopter une approche ethnographique en ayant recours aux méthodes de l'observation participante et de l'auto-ethnographie. Si ces méthodes ne constituent pas les données centrales de cette étude, elles ont un rôle contextuel. Elles requièrent mon implication en tant que chercheuse dans les terrains étudiés ; par conséquent, commenter l'usage de ces méthodes permet non seulement d'aborder les transformations mutuelles de la chercheuse et du terrain d'enquête, mais aussi d'interroger les implications éthiques qui en découlent.

Chapitre II – Définir la réparation de vélo

Le deuxième chapitre de cette thèse a pour objectif de caractériser les pratiques de réparation de vélo. Le champ des maintenance studies a permis de concevoir la réparation comme une pratique omniprésente et essentielle, et pourtant peu considérée. Or, la réparation fait appel à de riches savoir-faire et requiert une attention particulière aux objets matériels et à leur fragilité.

J'explore la manière dont la réparation de vélo se déploie dans la vie des cyclistes à travers trois

sections : dans la première, je définis la réparation ainsi que la panne de vélo. Je montre que panne et réparation sont très fréquentes dans la vie des cyclistes. Les expériences des cyclistes sont très éloignées de l'idée reçue selon laquelle une panne de vélo se produit, puis est réparée, comme le montre le cas répandu des cyclistes roulant au quotidien sur des vélos en mauvais état. Au contraire, panne et réparation sont souvent floues et difficiles à délimiter. Ces deux processus sont co-dépendants et se co-construisent au sein des pratiques des cyclistes.

Dans la seconde section, je m'intéresse aux modalités de la réparation. D'une part, j'interroge les outils et compétences nécessaires à la réparation, et la manière dont les cyclistes des deux villes y ont accès. À ce sujet, j'observe une importante hétérogénéité : dans les deux villes, il existe à la fois un grand nombre de cyclistes avec des compétences mécaniques très faibles, et un grand nombre de cyclistes avec des compétences avancées. D'autre part, je démontre que la réparation peut susciter de la frustration chez les personnes qui la réalisent, mais peut aussi donner lieu à de nombreuses formes d'improvisation.

Dans la troisième section, je questionne la répartition des pratiques de réparation. Le premier aspect de cette répartition est temporel : soit le vélo est réparé lors d'une panne, soit il est entretenu en amont. J'observe que les cyclistes les plus expérimenté-es en mécanique sont aussi les plus à même d'entretenir leur vélo, et que la question de l'entretien est centrale dans les relations entre cyclistes et mécanicien-nes professionnel-les. Le deuxième aspect de cette répartition concerne les différent-es acteur-ices de la réparation. Je montre que les cyclistes ont souvent recours à plusieurs acteur-ices de cet écosystème, parfois lors d'une même réparation.

Chapitre III – La relation cycliste-vélo

Dans ce chapitre, j'explore la relation entre les cyclistes et leur(s) vélo(s). Autrement dit, j'analyse le rapport à la matérialité de l'objet vélo. De fait, la réparation de vélo, tout comme les déplacements à vélo eux-mêmes, est une pratique matérielle centrée sur un objet : le vélo.

Dans une première section, je présente le modèle des possessions matérielles dans le but

d'interroger la relation cycliste-vélo. Ce modèle issu de la psychologie sociale propose une division en trois aspects ou motifs pour expliquer la possession d'un objet : les motifs instrumentaux, affectifs ou symboliques. J'emploie ce modèle de manière heuristique, c'est-à-dire dans le but de comprendre la façon dont les cyclistes de Lyon et Melbourne décrivent leurs pratiques cyclistes et leurs pratiques de réparation.

Ce modèle présente cependant des limites, que j'explore dans un deuxième temps. Dans cette section, je montre que les aspects de la relation entre cycliste et vélo sont interdépendants et que les séparer est illusoire. Par ailleurs, le modèle des possessions matérielles ne permet pas de traiter ensemble les pratiques cyclistes et les pratiques de réparation. Il ne prend pas non plus en compte le caractère évolutif de la relation cycliste-vélo. Face à ce constat, je suggère de fonder la conceptualisation de la relation cycliste-vélo sur la notion d'interaction matérielle. Présente dans plusieurs approches théoriques, cette notion permet de concevoir l'articulation des diverses dimensions évoquées ci-avant au sein des pratiques matérielles. La question n'est pas tant celle des raisons de la possession du vélo, que celle de ce qui est permis par les interactions matérielles entre cycliste et vélo.

Dans une troisième section, je présente le concept de vélonomie, largement utilisé dans les milieux militants francophones de la réparation, ce concept demeure plus marginalement convoqué dans la recherche en sciences sociales. La vélonomie est définie ici comme le niveau d'autonomie d'un-e cycliste, c'est à dire l'aisance que celle ou celui-ci montre lors de ses déplacements à vélo ainsi que lors de ses pratiques de réparation et d'entretien, et ce dans le but d'atteindre ses objectifs individuels ou collectifs. La vélonomie est une des formes que peut prendre la relation cycliste-vélo. Ce concept permet non seulement de dépasser les limites du modèle de la possession matérielle, notamment en tenant compte de l'imbrication entre les pratiques cyclistes et les pratiques de réparation, mais aussi de constituer une approche politique de ces pratiques. C'est pourquoi la vélonomie est le concept sur lequel s'appuie le reste de cette thèse.

Chapitre IV – Vélonomie et société de consommation

Le quatrième chapitre de cette thèse porte sur la manière dont la relation cycliste-vélo est transformée par la société de consommation dans les villes de Lyon et Melbourne. Si le vélo est souvent perçu comme un mode de transport à faible coût ou comme un symbole de liberté, étudier la réparation met en évidence le fait que les pratiques cyclistes représentent une forme de consommation qui est parfois contrainte.

Dans la première section, j'explore l'inscription des vélos et des pratiques de réparation dans la société de consommation. Je décris certains fonctionnements du marché du vélo ainsi que certaines interactions commerciales au sein des pratiques de réparation. J'explore en outre les phénomènes d'obsolescence programmée qui opèrent dans le monde du vélo.

Cette inscription de l'objet-vélo dans la société de consommation engendre des vélonomies différenciées en fonction des moyens financiers des cyclistes. Il s'agit de l'objet de la deuxième section qui porte sur les pratiques de réparation des cyclistes les plus pauvres et sur celles des plus riches. Je démontre que les cyclistes aux revenus les plus faibles ont des pratiques et des représentations de la mécanique vélo différentes de celles des cyclistes plus aisé-es. Les cyclistes les moins favorisés-ées présentent une propension plus élevée à réparer eux et elles-même leur vélo. Cependant, ces résultats fluctuent en partie entre Lyon et Melbourne. Cela signifie que l'effet du revenu sur les pratiques cyclistes dépend des spécificités urbaines, et notamment de la forme prise par l'écosystème de réparation.

Dans la dernière section, j'étudie l'écosystème de la réparation, en tant qu'il s'inscrit dans la société de consommation, c'est-à-dire en tant qu'il y participe ou y résiste. Je présente une attention aux cas particuliers que constituent les ateliers d'auto-réparation et les vélocistes. Tandis que les ateliers d'auto-réparation se présentent comme résistant activement aux dynamiques de marché dans lesquelles s'inscrivent les pratiques cyclistes, les vélocistes, quant à eux, orientent souvent

leur activité autour de la recherche de profit. Malgré cela, eux aussi contribuent au développement de la vélonomie des cyclistes qui les fréquentent.

Chapitre V – Vélonomies genrées

Ce chapitre propose un examen des aspects genrés des pratiques cyclistes et des pratiques de réparation. Je montre, d'une part, que les femmes font moins de vélo que les hommes et, d'autre part, qu'elles participent moins à leur réparation. J'analyse ces disparités en termes de rapports sociaux.

La première section du chapitre compare les aspects genrés des pratiques cyclistes à Lyon et Melbourne. Pour ce faire, je recours à deux concepts issus des théories féministes matérialistes et de la phénoménologie féministe : celui du travail de mobilité domestique, et celui des pratiques cyclistes inhibées. Ces deux concepts permettent d'appréhender les différences entre vélos associés aux hommes et vélos associés aux femmes : les premiers favorisent la prise de risque, la rapidité et le sport, quand les seconds insistent sur la participation au travail domestique et à la garde ou au soin des enfants. J'interroge également le rôle des relations hétérosexuelles dans cette répartition genrée.

La seconde section applique les mêmes concepts théoriques aux pratiques de réparation. Les femmes sont non seulement peu présentes dans les espaces de mécanique vélo, mais ont en outre souvent une maîtrise plus faible des savoir-faire associés. J'explique que cela résulte de divers mécanismes d'exclusion et de délégitimation. Ces mécanismes conduisent les femmes à ne pas fréquenter les espaces de réparation, à manquer de confiance dans leur propre expertise mécanique, et à manquer de savoir-faire. Or, les pratiques de réparation, tout comme les pratiques cyclistes, répondent à une répartition genrée. La structure familiale (et particulièrement le rôle du père), de même que les relations hétérosexuelles, construisent et entretiennent de telles disparités à l'endroit des pratiques de réparation.

La dernière section aborde différentes initiatives féministes qui contribuent à la réappropriation du vélo par les femmes. Ces initiatives participent à transformer et à subvertir le script de passivité auquel les femmes sont assignées : soit à travers la mise en place de stratégies individuelles visant à affirmer leur légitimité, soit à travers des mouvements collectifs leur

permettant d'accéder à des ressources, tout en redéfinissant les représentations genrées associées aux pratiques cyclistes et aux pratiques de réparation.

Conclusion

En résumé, cette thèse propose un examen détaillé des pratiques de réparation de vélo dans les villes de Lyon et Melbourne. Elle s'inscrit dans le champ de la sociologie et de l'urbanisme, et plus précisément dans le champ de la recherche en mobilités sur le cyclisme urbain, de la sociologie de la consommation et des maintenance studies.

Le premier apport de cette enquête est le concept de vélonomie. Ce concept permet d'aborder les pratiques cyclistes et les pratiques de réparation de vélo dans une perspective politique. Il amène à concevoir ces pratiques comme imbriquées l'une à l'autre. De plus, il permet de montrer que les pratiques de réparation reposent sur divers éléments tels que l'expérience individuelle des cyclistes, l'écosystème de réparation vélo, la conception de l'objet vélo lui-même, ainsi que des systèmes tels que la société de consommation ou le patriarcat. Le concept de vélonomie contribue ainsi à répondre à la question initiale suivante : quelles sont les conditions favorisant l'autonomie des cyclistes urbains dans leurs pratiques de déplacements et de réparation cycliste ? Autrement dit, il participe à l'identification des éléments constitutifs des pratiques cyclistes et des pratiques de réparation qui participent à cette autonomie.

Le deuxième objectif de cette étude est de décrire et caractériser les pratiques de réparation cycle. Cette description des écosystèmes urbains de réparation à Lyon et Melbourne m'a permis de mettre en exergue la diversité des pratiques, ainsi que les formes que prend l'apprentissage de la réparation. J'ai notamment identifié la coexistence des réparations amatrice et professionnelle dans les pratiques, sans que l'une d'entre elles ne prédomine.

Le troisième objectif de cette thèse est d'analyser les liens entre les pratiques cyclistes et les pratiques de mécanique vélo. Il s'avère que ces deux formes de pratiques sont imbriquées ; pour des raisons circonstancielles : elles sont effectuées par les mêmes personnes, et pour des raisons structurelles : elles sont souvent réalisées dans des buts proches.

Le dernier objectif de cette recherche consiste à étudier la manière dont les pratiques de réparation diffèrent en fonction de facteurs socio-économiques ou de l'environnement urbain. De fait, la vélonomie fluctue en fonction du revenu et du genre des cyclistes. Cependant, l'impact de ces caractéristiques socio-culturelles se trouve relativisé par les ressources apportées au sein de l'environnement urbain, à l'instar de la présence d'un important marché de l'occasion ou de nombreux ateliers d'auto-réparation.

Pour conclure, cette thèse présente une étude de la réparation et l'entretien de vélos en France et en Australie, et contribue à leur conceptualisation. Elle présente la mécanique vélo comme non seulement essentielle aux pratiques cyclistes, mais aussi comme ayant le pouvoir de les transformer. Enfin, elle permet de recentrer l'attention sur l'aspect matériel des pratiques cyclistes, et sur le vélo lui-même comme objet dont les nombreuses possibilités sont conditionnées par sa vulnérabilité.

List of tables

Table 2.1 – Sources of help sought by cyclists for their last repair 151
Table 3.1 – Affective descriptions of the cycle 175
Table 3.2 – Condition of the cycle and affective relation to it 179
Table 3.3 – Symbolic descriptions of the cycle 185
Table 3.4 – Instrumental descriptions of the cycle 188
Table 3.5 – General scale of the instrumental relationship 189
Table 3.6 – Embodied dimension of cycle use 194
Table 3.7 – Instrumental dimension and condition of the cycle 195
Table 3.8 – Affective link with the cycle and its social uses 200
Table 3.9 – Cycle categories and actual uses made of them by survey respondents 204
Table 3.10 – Cycle categories and actual uses made of them by survey respondents 219
Table 4.1 – Table of respondents' income 287
Table 5.1 – Action taken the last time the respondent's cycle broke down (according to gender) 369

List of Figures

Figure 0.1 - My greenish-grey cycle 17

Figure 0.2 - An element of the Système vélo: Sign on the floor signalling the proximity of a cycling repair station with available tools and pump, Melbourne. 21

Figure 0.3 - "Brake pads: When it's worn, bin it!": sign in a community workshop, Lyon 23

Figure 0.4 – Breaking the threads of a very old tyre in order to extract the inner tube from the wheel, Lyon 25

Figure 1.1 - Greater metropolitan areas of Lyon and Melbourne..... 40

Figure 1.2 - Melbourne CBD; Figure 1.3 - The CBD seen in the distance from a Northern inner suburb; Figure 1.4 - A commercial street; Figure 1.5 - A residential street; Figure 1.6 – A laneway; Figure 1.7 - view from the suburb of Saint Kilda (credit: Byron Carr).....42

Figure 1.8 – The city centre of Lyon; Figure 1.9 – An inner neighbourhood of Lyon; Figure 1.10 – The historical district; Figure 1.11 – A residential street of Villeurbanne; Figure 1.12 – A main road in Villeurbanne (Credit Lola Sinoimeri); Figure 1.13 – A residential street of Villeurbanne (Credit Lola Sinoimeri).....43

Community workshops in Lyon: Figure 1.14- Janus;, Figure 1.15 - Change de chaîne; Figure 1.16 - l'Etablicyclette; Figure 1.17- les Bikers; Figure 1.18- la Petite Rustine ; Figure 1.19 - le Chat Perché 49

Community workshops in Melbourne: Figure 1.20 - Bikes4Life; Figure 1.21 - the Bicycle Hospital; Figure 1.22 - WeCycle; Figure 1.23 - Second Chance Cycles; Figure 1.24 - Back to Bikes; Figure 1.25 - the Red Cross workshop.....50

Figure 1.26 – Distributing the survey at a red light during peak hour, Melbourne 56

Figure 1.27 – Number of survey respondents per postcode area in Lyon and Melbourne 57

Figure 1.28 – Ecosystem of actors of cycle repair and maintenance explored in Lyon 63

Figure 1.29 – Ecosystem of actors of cycle repair and maintenance explored in Melbourne 63

Figure 1.30- Auto-ethnographic research: Conversation with a community workshop volunteer

..... 68
Figure 1.31 – Participant observation – The researcher in the process of regreasing wheel bearings in a community workshop 68
Figure 2.1 - Coming back at night for another repair attempt after the previous one failed. 92
Figure 2.2 - Time since the last breakdown or instance of cycle dysfunction 98
Figure 2.3 - Vandalised cycles out in the street in Lyon.....104
Figure 2.4- Summary of the section: blurry repair and breakdown.....113
Figure 2.5 - Ease with repair according to city of residence 115
Figure 2.6 - Respondents' ease with specific repair operations 117
Figure 2.7 - Tool ownership and access (most frequent tools).....118
Figure 2.8 - Tool ownership and access (less frequent tools) 118
Figure 2.9 - Home-made solution to keep a cycle still for maintenance and repair.....119
Figure 2.10 - A tent peg and cable ties allowed Tom and his friend to continue their trip across Europe.....131
Figure 2.11 - Representations of maintenance according to ease with repair.....137
Figure 2.12 - Frequency of visits to a cycle shop in Lyon and Melbourne..... 145
Figure 2.13 - Cycles Guédon, a cycle shop in Lyon 145
Figure 2.14 - Frequency of visits to community workshops in Lyon and Melbourne.....147
Figure 2.15 - CERES bike shed, a self-repair workshop in Melbourne.....147
Figure 2.16 - Involvement in the last repair according to repair skills..... 149
Figure 2.17 - "Lube your bike!": child's drawing in a Melbourne cycle shop..... 155
Figure 2.18 - Example of a service reminder by a cycle shop to a customer 156
Figure 2.19 - Example of diagnosis of a cycle. Credit: Roulement à Bill.....157
Figure 3.1 - Spare parts and bolts during the repair and re-greasing of a pedal..... 165
Figure 3.2 - Menu of the website for Giant, one of the most famous cycle manufacturers and retailers (June 2022) 201
Figure 3.3 - Self-assessment by survey respondents of their level of ease with cycle repair according to their frequency of cycle use. 207
Figure 3.4 - A cycle with inverted handlebars, a transformation sometimes adopted by cyclists

wishing to ride with a more upright posture than the one encouraged by the initial position of the handlebars....217
Figure 3.5 - Cardboard from a beer pack turned into a DIY mudguard 218
Figure 3.6 - Australian Peugeot 225
Figure 4.1 - Community Bikes, Brunswick, Melbourne – Credit: Faith Hunter 266
Figure 4.2 - Length of ownership of the main cycle, according to city of residence 270
Figure 4.3 - Length of ownership of the main cycle, according to the age of the cyclist 270
Figure 4.4 - Perceived affordability of cycling according to income quintiles (in Lyon) 290
Figure 4.5 - Condition in which cycle was purchased (new or second-hand) according to income quintiles 290
Figure 4.6 - Involvement in the repair of one's cycle according to income quintiles 293
Figure 4.7 - Community workshop attendance according to income quintiles 293
Figure 4.8 - Perception of the difficulty of repair according to income quintile 296
Figure 4.9 - Percentage of second-hand cycle purchases according to income quintile in Lyon 302
Figure 4.10 – Percentage of second-hand cycle purchases according to income quintile in Melbourne 302
Figure 4.11 - Cycle shop attendance according to income quintile in Lyon and Melbourne 303
Figure 4.12 - Community workshop attendance according to income quintile in Lyon and Melbourne 303
Figure 4.13 - Percentage of cyclists who got their cycle serviced in the last year according to income quintiles, in Lyon and Melbourne 303
Figure 4.14 - Values of the community workshop are written on the wall 316
Figure 4.15 - The owner of Pony Bikes preparing coffee in front of a sign reading "Flat whites not flat tyres". 338
Figure 5.1 - Frequency of riding among Lyon and Melbourne cyclists according to gender 347
Figure 5.2 - Number of cycles owned according to gender.... 352
Figure 5.3 - Type of cycles owned by cyclists in Lyon according to gender (most common types of cycles); Figure 5.4 - Type of cycles owned by cyclists in Melbourne according to gender (most

common types of cycles) 355
Figure 5.5 – Type of cycles owned by cyclists in Lyon according to gender (less common types of cycles); Figure 5.6 – Type of cycles owned by cyclists in Melbourne according to gender (less common types of cycles) 356
Figure 5.7 – Stated overall ease with repair according to respondent gender 368
Figure 5.8 – Stated experience with adjusting cycle brakes according to respondent gender368
Figure 5.9 – Willingness to try repairing according to the gender of respondents 378
Figure 5.10 – Feminist ride in Lyon, September 2020 (Credit: Valérie Rochet).....397

Appendix

Appendix 1 – Questions of the Cycle Repair Survey--------p463

Appendix 2 – Uses of the Term "Velonomy" in French Activist Circles----------p473

Appendix 3 – Equivalence between Income Quintiles in France and Australia----------p475

Appendix 1 – Questions of the Cycle Repair Survey

Here are the questions that were included in the cycle repair survey. This survey was simultaneously designed in French and English, but for better readability, I only included the English version in this Appendix.

Welcome! This survey aims to collect data concerning behaviour of people owning a bicycle in Melbourne, especially as far as maintenance and repair of this bicycle is concerned. The information collected remains anonymous and is not used for other purpose than research. It will take you approximately 15 minutes to complete this survey: surveys that are completed until the end are extremely valuable to us! This survey has four main sections: one about bicycle maintenance and repair, one concerning your bicycle and your cycling habits and a last one about how you feel about cycling in the city. Thank you very much for your contribution to this study!

1. Possibilities for mobility outside of cycling

Do you

- Have a car driving license
- Have a motorcycle driving license
- Have a Myki card with money on it
- Own a car

[if no] Have easy access to a car

- Own a motorised vehicle (motorcycle, moped…)

[if no] Have easy access to a motorised vehicle (motorcycle, moped)

2. Possibilities for mobility related to cycling

- Do you own several bicycles?

[If yes] how many? (2 – 3 – 4 – 5 or more)

Are you registered to a local bike share service (ex: Melbourne Bike Share, oBike)?

3. Possibilities for repair

Among the following tools, which ones do you have access to, at home or elsewhere? [Possible answers are "have at home"/"do not have at home but have easy access to"/"no access" for each tool]

- Bicycle pump
- Spanners, wrenches or Allen/hex keys
- Puncture repair kit
- Chain oil
- Chain tool
- Spoke tool
- Bicycle stand
- Multitool

Do you sometimes go to a bicycle repair shop (y/n)

Have you already heard of community bicycle workshops? (y/n) [if yes] Are you member of one

of them?
[if yes] Which one(s)?
Can one or several of your friends or relatives help you with bicycle repair if necessary? (y/n)

4. Past experiences related to bicycle repair and maintenance

The following questions are about the last time your bicycle or one of your bicycles started being dysfunctional or broke down

What bike part had a problem (ticking several options allowed)?
- The wheels/tyres
- The brakes
– The chain/Derailleur/gears
– The steering (handlebar)
– The frame
– Other
– I have not had any problem yet
– I don't know

Was this problem a puncture, or flat tyre? (y/n)
Did this problem occur after a shock or accident? (y/n)
If possible, please describe in a few words the problem here below

What did you do (possible to tick several boxes)?
- You took it to a bicycle repair shop or to a bicycle mechanic
- You fixed it on the spot
- You brought it home to fix it there
- You did not do anything

[if yes to this last point]
o did you keep riding this bicycle? (y/n)
o Are you now riding another bicycle? (y/n)
Did you repair or fix your bike yourself, entirely or partially? (y/n)

Did you receive help to repair your bicycle?

- I did not receive any help
- From a bicycle repair shop or bicycle mechanic
- From a friend or acquaintance
- From a collaborative bicycle workshop
- From the Internet (online videos or websites)
- From someone or somewhere else : _ _ _

[if did not tick the first box] What was the nature of this help?

o Providing with tools

o Advice

o Physical assistance

o Other:

5. General questions concerning maintenance and repair

The following questions aim to find out more about your maintenance and repair general habits

Have you already helped someone else fix a bicycle? (y/n)

Have you already performed operations on a bicycle to enhance it or making it fit you better? (y/n)

Have you already built a bike from spare parts? (y/n)

Do you regularly pump up your tyres? (y/n)

Do you regularly oil the chain of my bicycle (y/n)

Has your bike been serviced in the last year? (y/n)

To what extent do you agree with the following sentences [7 points likert scale, from 1= not at all, 7= completely]:

- It is important to regularly maintain a bicycle
- Most of the time, I find it easy to figure out what is wrong with a bicycle
- When I have access to the right tools, I find it easy to repair most problems on a bicycle
- I find it long and complicated to repair most things on a bicycle
- Even when I do not know how a bicycle part works, I am willing to try and fix it
- My current riding experience could be improved by some repair of my bicycle

6. Different bicycles used

Among the following types of bicycle, which one do you sometimes use?

- Your own bicycle
- A bicycle from a local bike share service (ex: Melbourne bike share, oBike)
- A rental bicycle
- A bicycle that has been lent to you
- A bicycle made available to you by your work
- Other:

[If more than one option has been ticked] Which of these do you ride the most often?

- Your own bicycle
- A bicycle from a local bike share service (ex: Melbourne bike share, oBike)
- A rental bicycle
- A bicycle that has been lent to you
- A bicycle made available to you by your work
- Other:

7. A few details about your bicycle

The following questions are about your bicycle (or, if you own several, the bicycle that you use the most often).

How long have you had it?

- For less than 6 months
- For 6 months to 1 year
- For 1 to 2 years
- For 2 to 5 years
- For more than 5 years

is it:

- an electric bicycle
- a cargo bicycle

- a folding bicycle
- a fixie/fixed-gear bicycle
- other:

In what condition did you acquire it? (new/second hand)
In what state is currently your bicycle? (In very poor condition • As new) [7 steps Likert scale]
How would you describe your bicycle in a few words?

8. Cycling habits

This section aims to better understand your cycling habits

How often do you cycle?
- Once a month or less
- About 2-3 times a month
- About once a week
- About 2-3 times a week
- Every day or almost every day

Do you ride a bicycle:
- All year long/ most months/ only in Summer
- Under any weather condition/ under most weather conditions/ only in sunny weather

Where do you cycle to?
- To/from work or school/university
- To ride along with your family/children
- To the shops
- To other personal trips (visiting friends, going out…)
- For leisure/exercise rides
- Other:

Your main transportation mode is the bicycle (y/n)

What is approximately the length of your most frequent bicycle ride, in kilometres?

How long does it take you to do this trip?

Do you ride with other people? (never_all the time [7 points Likert scale])

Do you sometimes engage in [y/n]

- Bike touring/ Bike-packing
- Mountain biking
- Race biking
- Delivery by bicycle
- Other

9. Perceptions of cycling

This section aims to get to know what you think about cycling in the city.

For each sentence here below, to what extent do you agree with what is said? [7 points Likert scale]

[1. Instrumental aspect of cycling]

[1.a. Instr - General questions for utilitarian aspect]

- Riding is comfortable

[1.b. Instr - Perceived short-term benefits]

- Riding is enjoyable
- Riding is a quick way to get around
- Riding saves money
- Riding is a convenient way to get around
- Riding is relaxing

[1.c. Instr - Perceived long-term benefits]

- Riding improves my health and fitness
- Riding has good effects on the environment
- Riding improves my quality of life

[2. Affective criteria]

- I love riding my bicycle
- My bicycle is beautiful
- I would be very sad if my bicycle got stolen
- My bicycle reminds me of good memories
- When riding my bicycle, I am in control

[3. Symbolic criteria]

- My bicycle shows who and what I am
- I am proud of my bicycle
- By riding my bike, I am acting according to my values
- My friends and relatives think that my bike is great
- I sometimes describe myself as a cyclist

[4. General attitude towards cycling]

- Bicycles should have more space in the city
- Cycling provides me with freedom I feel safe when riding in the city

10. Personal information

In order to analyse this survey, we need some information about you. In no way this information will be used for any other goal than this research project.

Year of birth
Gender (M/F/Other)
Postcode

Do you face some difficulties when moving in the city, due to physical or health issues?

[if yes] Are these difficulties relevant to your bicycle use?

You are working / retired / non-working / studying / other (several options possible)

[if working] to what range do your weekly total cash earnings belong?

- Less than 520$/week
- Between 520 and 900$/week
- Between 900 and 1,200$/week
- Between 1,200 and 1,800$/week
- More than 1,800$/week

What is the highest level of education you have completed?

- None
- Pre-primary education
- Primary education
- Lower secondary education
- Upper secondary education
- Post-secondary non-tertiary education
- Short-cycle tertiary education
- Bachelor or equivalent
- Master or equivalent
- Doctoral or equivalent

What is your country of birth? Australia/ Other:

You are now done with completing this survey! Would you agree to potentially be contacted for a more thorough chat about your experiences of cycling in Melbourne? [yes/no, exit the survey]

[if yes] What is your preferred contact method: email/phone

[if email] Please write your email address here

[if phone] Please write your phone number here.

What time of the day/week would you rather be contacted?

Thank you very much for taking the time to answer this survey!

Appendix 2 – Uses of the Term “Velonomy” in French Activist Circles

Quotes from the online encyclopedia Wiklou that mention the term velonomy (vélonomie in French)

	Quote from the text	Extract from
1	« La diversité des bénévoles/salariés d’un collectif peut engendrer autant de manière de faire que de personnes. Les uns sont adeptes de cours magistraux, les autres de laissez-faire, les troisièmes font à la place des gens tandis que les derniers leur apprennent la vélonomie. »	Wiklou, « La pédagogie dans les ateliers vélo »
2	« L'activité d'échange de savoirs est une des bases de l'association et l'occasion de développer la vélonomie, contraction d'autonomie et de vélo.»	Wiklou, « L’atelier uN p'Tit véLo dAnSLaTête»
3	« Les cours de mécanique vélo. Pour ceux qui souhaitent aller plus loin dans la "vélonomie", tout savoir sur le dérailleur, pouvoir re-rayonner une roue, ou simplement la dévoiler, etc. Des sessions sont organisées régulièrement. »	Wiklou, « L’atelier Le Vieux Biclou »
4	Fiche vélonomie : fiche de diagnostic du vélo de l’atelier Roule&co	https://wiklou.org/wiki/Fichier:Fiche_velonomie.jpg
5	« Un nouveau local de plain-pied, vous permet de (re)donner vie à votre vélo en toute Vélonomie, dans plus de confort, plus de place, plus de convivialité ! »	Wiklou, « L’atelier La Bricolade »
6 7	« Les ateliers sont des lieux d’apprentissage pour permettre à chacun.e de devenir autonome (ou vélonome : L'Education Populaire : Faire et apprendre pour être vélonome !) dans sa pratique du vélo. » « Mettre en place un lieu convivial afin de favoriser la vélonomie par la mutualisation des savoir-faire en matière de mécanique vélo. »	Wiklou, « L’atelier BaPaV »

8	« Pour garantir l'utilisation d'un vélo, il est préférable d'apprendre à celui qui l'utilise comment l'entretenir et le réparer. Ainsi, l'atelier est un lieu d'échanges de savoirs pour permettre à chacun d'atteindre un certain niveau d'autonomie dans la réparation de sa bicyclette. C'est ce que nous appelons la « vélonomie ». Une maîtrise pleine et entière de son véhicule ! »	Wiklou, « Education Populaire »
9	« L'autoréparation est une pratique qui consiste à effectuer des réparations par soi-même. C'est une compétence participant à la vélonomie. Son développement est promu par les ateliers participatifs et solidaires membres de l'Heureux Cyclage. »	Wiklou, « Autoréparation »
10	« Une permanence des gants blancs est une permanence pédagogique pendant laquelle les bénévoles enfilent tous des gants blancs afin de s'assurer qu'ils ne toucheront pas les vélos, ni les outils. Ceci dans le but de développer au maximum la vélonomie des adhérents en leur laissant faire le plus de mécanique par eux-même. »	Wiklou, « Permanence des gants blancs »
11	« Ensuite, grâce à la qualité de vos prestations, et comme vous en profiterez pour faire passer le message de la vélonomie aux utilisateurs, une intervention annuelle suffira. »	Wiklou, « Entretien (Prestation) »
12	« Auto-réparation = vélonomie. Dans l'objectif d'une ré-appropriation de savoirs, de ses 10 doigts et de son temps libre. »	Wiklou, « Bretz'selle et l'essaimage »
13	« Margot écrit dans Chasse-Goupille, le fanzine de l'émancipation par le vélo, elle a travaillé comme Matthieu à l'essaimage de la vélonomie. »	Wiklou, « Un accident presque banal »
14	« Cet espace privilégié se veut être un rouage propice et acteur vers l'autonomie (ce qu'on appelle la vélonomie dans le monde du vélo), symbole de liberté individuelle et émancipation sociale. »	Wiklou, « L'atelier Plan B »
15	« Une fois qu'on a compris le principe du cône et de la cuvette, il y a tout pour être vélonome »	Wiklou, « Ecorché de pièce de vélo »

Appendix 3 – Equivalence between Income Quintiles in France and Australia

The following table suggest equivalences between French and Australian income quintiles. According to the website of the OCDE, price levels in Australia are 25% higher than in France. Furthermore, in 2018, the change rate of Euro to Australian dollar was of 0.63. Besides this, the median income in Australia is about 44% higher than the French national median income. In total, real wages in Australia are about 15% higher than French real wages, that is to say, when taking purchasing power into account, Australians wage-earners are on average 15% richer than French wage-earners.

The tables compares income quintiles that have approximately the same purchasing power in the two countries. The first income quintile in Australia corresponds roughly to the first two income quintiles in France, the second Australian income quintile corresponds to the third French income quintile, etc. This means that French people whose wages are located in the third quintile earn about the median income for France, but that their purchasing power is the same as an Australian person in the second income quintile.

Quintile	Wage in Australia	Annual wage in euros	Real annual wage adjusted with purchasing power difference	Annual wage in the same quintile in France
Q1	Less than 520$/week (27,040$/year)	Less than €17,035	<€13,628	<€9,800
Q2	Between $520 and $900/week (between $27,040 and $46,800 a year)	Between €17,035 and €28,484	Between €13,628 and €22,787	Between €9,800 and €16,700

Q3	Between $900 and $1,200/week (between $46,800 and $62,400/year)	Between €28,484 and €39,312	Between €22,787 and €31,450	Between €16,700 and €21,600
Q4	Between 1,200 and 1,800$/week (between $62,400 and $93,600 a year)	Between €39,312 and €58,968	Between €31,450 and €47,174	Between €21,600 and €29,300
Q5	More than 1,800$/week ($93,600 a year)	More than €58,968	More than €47,174	More than €29,300

Income quintile equivalences in France and Australia

This equivalence table shows that, in order to compare repair and maintenance practices of French and Australian cyclists, we could compare different quintiles. However, the differences observed above between Lyon and Melbourne are stronger than this one-quintile difference. Thus, it seems that higher purchasing power in Australia is not the main reason for the difference between the practices of urban cyclists of both cities. Each urban environment provides cyclists with different resources for cycling equipment, and for cycle repair and maintenance, which makes the experience of earning a lower or higher income different.