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Towards a sustainable mobility transition? A cohort approach for Millennials and Baby Boomers in Europe

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You never change anything by fight ing the existing reality.

To change something, build a new model that

makes the existing model obsolete.

Buckminster Fuller

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Introduction

This work takes its origins from a strong personal, professional, and academic passion I developed over years around the world of sustainable mobility. Raised as a car dependent person living in a car dependent suburban town in northern Italy, for me it was a shock when I realised that the car was *not* the efficient, invincible means I always thought it was. Since then, I started to deepen this interest in many ways, trying to understand the dynamics underlying mobility behaviours, but most of all searching ways to make other people live the same beneficial shock I had, finding scientific ways to support mobility policies and trying to be an active part of the "mobility revolution" I would love to see in the world. Not only because there is an emergency called global warming we need to face; but also because a different mobility is *desirable* and will make our lives *better*.

One main input came in particular during the summer of 2016, when my supervisor Matteo Colleoni, before my PhD application, recommended me the paper "Gross polluters and smart travellers" written by Mattioli & Anable (2017). The research showed how new cohorts of older people were characterised by common carbon-intensive practices of food shopping travel, with patterns of frequent (and not-so-short) car trips to the shops. This is also connected with the fact that food shopping, for them, is also a social and leisure activity, representing an opportunity to leave the house. This made me reflect on few things: first, on the serious impact of the supposedly banal daily mobility habits; secondly, on the peculiarity of this new generation of elderlies, which is much more different from the elderlies we used to know and study in previous years. Third, on the fact that this generation is actually something we know very well, because… it is the one of our parents. The parents of *us*, the Millennials: the last creature of the XX century.

By the time I was applying for the URBEUR PhD programme, choosing my two generations to compare, the debate on Millennials was just starting to grow in Europe, and it was more and more recognised as a *category* in the academic world and popular media as well. Later on, when I was already in the middle of the research, the "Ok Boomer" catchphrase exploded on the internet, making popular and broadly recognised also the Baby Boomer cohort. It was like the world autonomously decided to introduce my research to the public, making my work less difficult to understand. So thank you, world.

The question that remains unanswered is then: will it come a time in which a new trend will emerge on the internet from the next generations, spreading the slogan "Ok Millennial"? And what does this formula mean, by the way? The answer to these and many other questions will unfold – hopefully – in this text developed during my three years of PhD.

The instruments used to answer include a quantitative analysis of European datasets to study trends and behaviours on a large scale ("from above"); plus a qualitative analysis carried on in the Italian context to deepen the investigation on attitudes and behaviour change dynamics starting from personal experiences ("from inside").

The manuscript will start introducing the topic of human mobility and travel behaviour, focusing on their impact on the environment and society and highlighting their emergence as a distinct field of study (chapter 1: "Mobility Matters"). Emphasis will be given on the role of the transport sector in the environmental crisis, the societal consequences of the "automobile system" and the main current debates in the academic and political agenda on the role of social sciences in mobility studies, concluding with an overview of the vision and policies adopted by the European Union to contain the negative impacts of mobility in the environment and society.

Chapter 2 ("Gross polluters and smart travellers? A cohort approach") will go into detail on the protagonists of the research, the two generations analysed: Millennials and Baby Boomers. It will start introducing the connection between travel behaviour impact and socio-demographic composition of the population, describing the cohort approach. It will then dive into the literature around the two cohorts, explaining who are them and what defines them as a generation, in terms of socio-demographic, contextual, and behavioural characteristics, highlighting why it is important to focus on them in particular and what are the origins and implications of their current and future behaviour for the environment and society.

Chapter 3 ("Methodology") is dedicated to the description of the methods and data sources employed in this research. It will introduce the framework of the Sustainable Transition Studies, integrated and guided by the principles and theories exposed by John Urry in the New Mobilities paradigms, and it will clearly illustrate the research aim, questions and expected outcomes.

Results will be then presented in chapters 4 and 5. In particular, chapter 4 ("'Ok Boomer': cohorts in comparison") is dedicated to the results of the quantitative analysis of European-wide databases, with an analysis of the life circumstances of the two cohorts and their travel behaviour attitudes, exploring also what have been called the "geographies of behaviours", looking at national and regional differences among the European territory and concluding with a regression analysis on the presence of a cohort effect in the modal choice. Thus, chapter 5 ("Millennials in transition") will illustrate the results of the qualitative analysis conducted in the Italian territory with a series of focus group, going deep in the

role played by the location of residence, generational differences and life stages and using the categories of car dependency and mode choice as a framework to analyse behaviour.

With the final chapters 6 and 7, the initial theoretical framework will be merged with the research questions, discussing the results obtained by the analysis. What are the reasons behind Millennials' travel behaviour changes? Is this is part of a generational change that will persist over time, resulting in an overall and long-lasting improvement in the environmental impact? The answers to these questions will be illustrated making reference to the literature exposed in the theoretical chapters, further enriching the debate on peak car and sustainability transitions, taking in consideration the cohort peculiarities and the territorial scale.

The dissertation will conclude offering a framework to read the different shades of car dependency, making easier to observe differences among generations, and giving space for some targeted policy suggestions. It will close ultimately with the exposition of the limitations, further developments and original contribution of this research.

1 Mobility Matters

The aim of this chapter is to introduce the topic of human mobility and travel behaviour, focusing on their impact and consequences on the environment and society and highlighting their emergence as a distinct field of study. It will be deepened the role of transport sector and the car in the environmental crisis due to climate change, and explored the other societal consequences linked with the current "automobile system" (par. 1.1). It will then be analysed the role and contribution of social sciences in mobility studies, with special regards to urban sociology and the emergence of multidisciplinary approaches such as Sustainable Transition Studies and the Sustainable Mobility Paradigm and New Mobilities Paradigm (par. 1.2), and explained the main current debates in the academic and political agenda (car dependence, peak car hypothesis, and the "three revolutions", par.1.3). Paragraph 1.4 will describe the epistemology of travel behaviour studies, showing the main approaches and the factors affecting travel behaviour and modal choice according with the literature. Finally, the chapter will be concluded with an institutional point of view on the vision adopted by European Union and what has been done in the last decades to contain the negative impacts of mobility in the environment and society in terms of policies (par. 1.5).

Question	Content	Par.
Why is mobility important?	Impact on the environment & society	Par. 1.1
How to approach it?	The role of social sciences in mobility studies	Par. 1.2
What are the hot topics?	Car dependence, Peak Car, the Three Revolutions	Par. 1.3
How to study them?	Factors affecting travel behaviour & modal choice	Par. 1.4
What has been done in EU in terms of policies?	From science... to policy: visions & targets	Par. 1.5

1.1 Impact of human mobility on the environment and society

1.1.1 Role of transport sector and the car in the environmental crisis

With the majority of people living in cities - 54% globally, and 74% in Europe (European Commission, 2019) – urbanization is continuing worldwide, with a substantial impact on the environment. Cities have long been known to be society's predominant symbol of innovation and wealth creation but are now also representing the main source of

pollution. Global CO2 emissions have increased of +62% from 1990 to 2016 (Le Quéré et al., 2018). During the economic crisis of 2008-2009, global emissions experienced a decrease of -1.4% (Global Carbon Project[1]); but the effect was temporary, and with the end of the crisis they started to grow back, with 16% increase from 2009-2018. In recent years, it can be noted a moderate decrease experienced by Europe and USA – especially due to a sharp decline in CO2 emissions from the power sector, thanks to the expanding role of renewable sources (IEA, 2020) – which is however compensated by high rates of increase of fast-growing countries such as China and India (Figure 1.1).
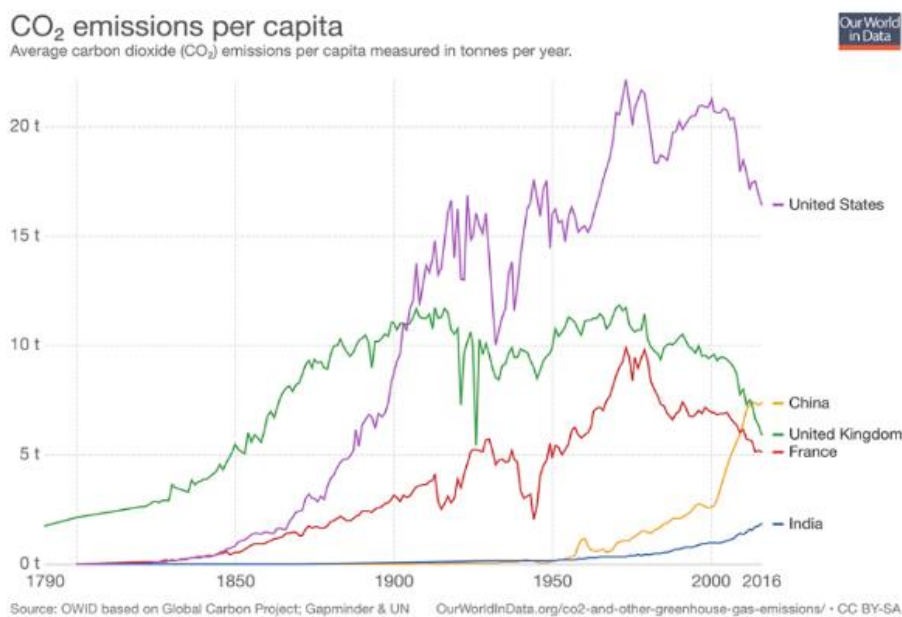
Figure 1.1. CO2 emissions per capita (average tonnes per year). Source: Global Carbon Project; graphic elaboration by Our World In Data

The transport sector represents the 25% of the total greenhouse gases (GHG) emissions (IEA, 2015) and it is the only major sector of the economy where emissions continue to grow and at a fast pace (Figure 1.2): the level of CO2 emissions from transport in 2016 is 71% higher than what was seen in 1990 (IEA, 2016). This because transport activity represents one of the most important sectors of the global economy, and it is growing

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[1] Global Carbon Project (GCP) is a Global Research Project of Future Earth and a research partner of the World Climate Research Programme. It was formed to work with the international science community to establish a common and mutually agreed knowledge base to support policy debate and action to slow down and ultimately stop the increase of greenhouse gases in the atmosphere.

significantly, with previsions of highest increase during 2010-2030, driven by developments in economic activity (European Commission, 2016). According to the Transport Outlook report (International Transport Forum / OECD, 2019), it could even increase by 60% by 2050, becoming the largest emitter of GHGs, which is already the case in some developed countries. Central to such transport-related emissions is car travel. In Europe, road transport is estimated to grow at 16% by 2030, and 30% by 2050 (European Commission, 2019b). The number of cars (and car mobility) in the world continues to rise. Again, this is particularly severe in countries with rapidly growing economies, which are following mass motorization trajectories of developed countries (Singh, 2012), and the attached "automobile culture". With the help of technological improvements in transport sector, there have been some efficiency gains in emissions, but the overall trend is still strongly upwards, as the increased demand for travel outweights the technological gains (Banister, Schwanen, & Anable, 2012).
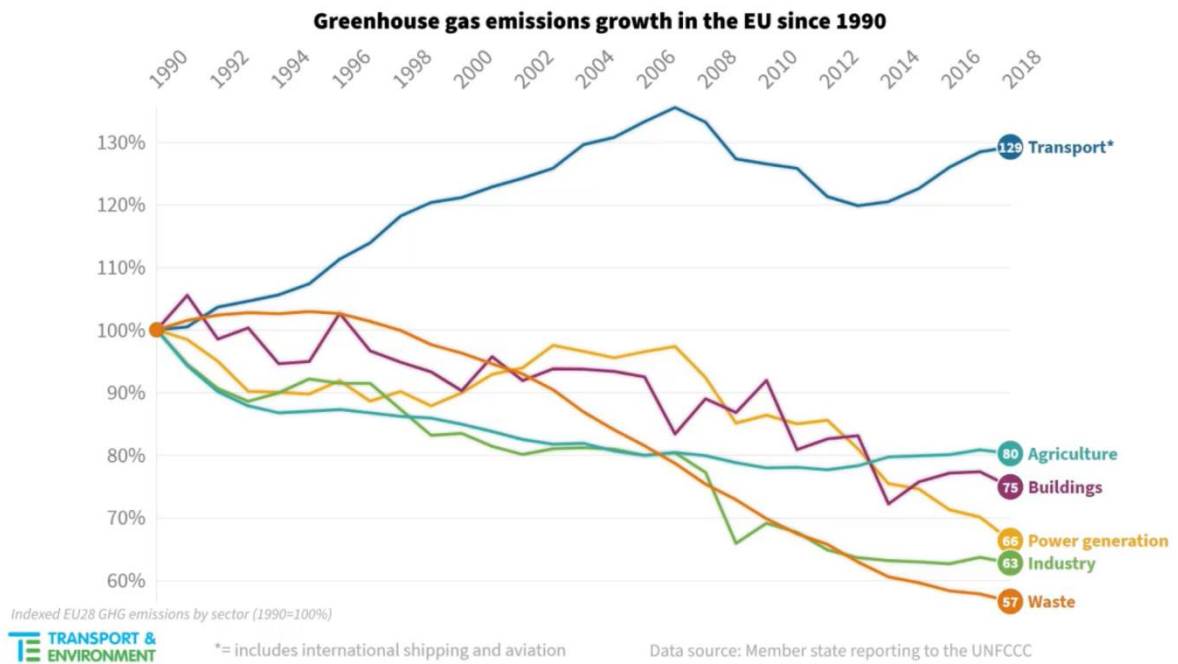
Figure 1.2. Greenhouse gas emissions growth in the EU since 1990, elaboration by Transport & Environment

1.1.2 It's not only about global warming

Besides being a big contributor to both climate change and oil depletion – arguably two of the most important environmental challenges of the XXI century - the transport sector,

with particular reference to car, is also responsible for other negative externalities which involve air quality, health, and quality of life and urban space. On this matter, Schwanen et al. (2011:1004) raise the questions: "What is the kind of world that we would like to live in and find desirable, and how should mobility be configured in that world?". A question which cannot be answered solely by reference to carbon emissions.

In the first place, car is one of the main causes of air pollution (Schäfer, Heywood, Jacoby, & Waitz, 2009; Sims R., Schaeffer, 2014). In European cities, road transport is estimated to be responsible for up to 30% of small particulate emissions (PM), the main factor responsible for air pollution-related deaths and illnesses (European Commission, 2019b). Air pollution continues to have significant impacts on the health of the European population, particularly in urban areas. Europe's most serious pollutants, in terms of harm to human health, are PM, NO2 and ground-level O3. Some population groups are more affected by air pollution than others, because they are more exposed or vulnerable to environmental hazards. Lower socio-economic groups tend to be more exposed to air pollution, while older people, children and those with pre-existing health conditions are more vulnerable (EEA, 2019). More than 400.000 citizens die prematurely in the EU each year as a result of poor air quality; millions more suffer from respiratory and cardiovascular diseases caused by air pollution. Persistently high levels of nitrogen dioxide (NO2) caused almost 70.000 premature deaths in Europe in 2013, which was almost three times the number of deaths by road traffic accidents in the same year[2]. In addition, traffic-related air pollution also has considerable economic impacts, cutting lives short, increasing medical costs and reducing productivity through working days lost across the economy (EEA, 2019) and represents a major threat to the quality of life in metropolitan cities, since – other than health – it can further damage their image, reputation and economic performance (Mingardo, 2008).

Other than the high mortality rates coming from air pollution, car is a major contributor to fatalities and injuries due to road traffic. In many countries, car accidents are a leading cause of death among children and young adults (WHO, 2018)(Figure 1.3). On European roads in 2015 took place 26.134 road traffic deaths and 1.09 million road accidents with personal injuries (European Commission, 2019b).

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[2] Source: European Commission, Press release 15 February 2017 available at http://europa.eu/rapid/press-release_IP-17-238_en.htm (last seen: 20/04/20)

Rates of road traffic deaths around the world

Deaths per 100,000 population by region

■ 2013 ■ 2016
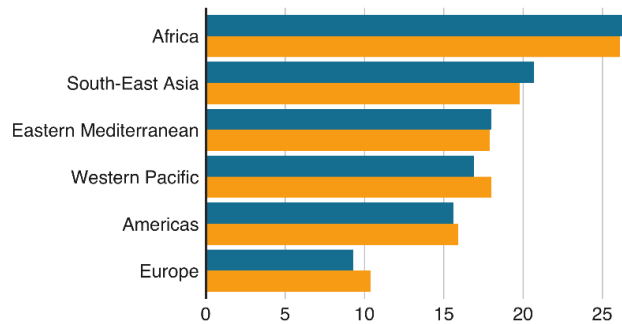
Figure 1.3. Rates of road traffic deaths around the world. Deaths per 100.000 population by region. Source: WHO. Elaboration by BBC.

Ultimately, cars have a considerable effect on the quality of life. In the first place, with regard to urban space. For thousands of years streets have been the epicentre of the social, cultural, and economic life of cities (Engwicht, 1999); while since the advent of cars, cities have experienced a car-oriented planning, with wide use of public space as an asset for car traffic (Figure 1.4). As Lofland notes (1998), people who travel by car in their daily routine, are not sharing buses, trains, and public spaces with other people, while without cars, people occupy the public realm in greater numbers and diversity, also implying more people on the streets, with an increasing in individual safety and a decline in fear of victimization, suggesting that reliance on car transportation may compromise the restorative quality of the public realm and hinder the realization of some greater restorative potential (Hartig, 2007). In the second place, for what concerns the impact on time use as well: according to data elaborated by JRC (Joint Research Centre of the European Commission) and TomTom[3], EU citizens spend an average of almost 30 hours per year in road congestion (Figure 1.5).

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[3] Available in the website of the European Commission: https://ec.europa.eu/transport/facts-fundings/scoreboard/compare/energy-union-innovation/road-congestion_en with data coming from TomTom https://www.tomtom.com/en_gb/traffic-index/

Figure 1.4. Whose this space? On the left, a car parking in the city centre of Rome; on the right, Catania. Photos by the author.

Hours spent in road congestion annually - 2017

UK	45.73
BE	39.37
IT	37.36
LU	36.88
EL	36.28
CY	35.73
IE	35.03
BG	34.10
RO	31.91
NL	31.89
FR	30.14
DE	29.90
PT	28.71
HU	27.61
AT	27.22
SI	26.20
ES	25.60
PL	25.02
DK	24.57
HR	23.71
CZ	23.36
SK	23.33
LV	21.81
SE	21.56
LT	20.99
EE	19.39
FI	18.13
MT	Not applicable -
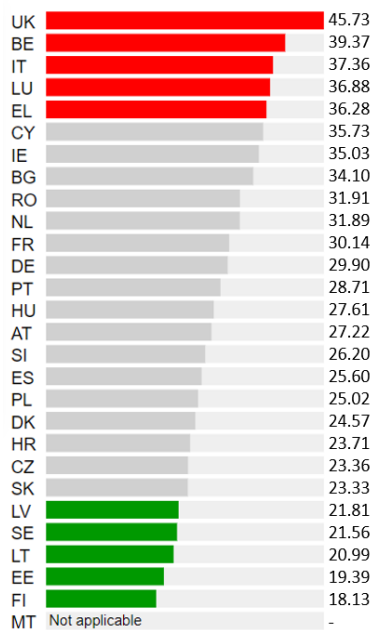
Figure 1.5. Hours spent in road congestion by the average driver every year. This indicator assumes two 30km trips per day (morning peak and evening peak) and 220 working days. It takes into account all major roads in the Member States for which data is available.

For all the reasons explained above, the current mobility model of industrialised countries – based on the prevalent use of private car – is considered unsustainable, especially if projected into a large-scale diffusion among fast growing countries. This is why

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one of the main focus of the academic and global agenda is the research and development of new mobility models to integrate the traditional ones and go over the current *auto-mobility system* (Urry, 2007), towards a transport system with a lower impact on climate change and quality of life.

The reduction in the number of cars, and therefore a reduction in the need for parking places and road space, provides opportunities to increase green space and green networks in cities, which in turn can lead to many beneficial health effects. All these measures are likely to lead to higher levels of active mobility and physical activity which may improve public health the most and also provide more opportunities for people to interact with each other in public space (Nieuwenhuijsen & Khreis, 2016). Furthermore, such initiatives, if undertaken at a sufficiently large scale can result in positive distal effects and climate change mitigation through CO_2 reductions.

1.2   Approach: the role of social sciences

1.2.1   Mobility & the city in the sociological discourse

Cities are central in the study of environmental impact of human actions. They are particularly exposed and vulnerable to the effects of the climate change, but at the same time they could play a leading role in helping to avoid it, with a great potential of influence on the economy and the environment. As stated by the European Commission in the document "Clean Planet For All", containing the long-term strategy for EU Climate Action (European Commission, 2018a), cities are already the *laboratories* for transformative and sustainable solutions. However, their transition depends on a wide range of things, such as their financial and social capital and their levels of ambition, investment, and activity. This requires enormous investments and major new initiatives with widespread and sustained influence in all sector of transport and cities development, considering also the social and political acceptability of the pathways towards a low carbon city and society (Kuylenstierna, Elena Dawkins, & Topi, 2012) which will need a substantial support from the field of social sciences.

The term "mobility" itself has entered the social sciences during the '20s with Sorokin (1927) and Park (Park & Burgess, 1925) among the researches of the Chicago School, as a central tool to measure and observe how the society was changing and explaining city dynamics, organisation and problems – as it was already mentioned by Simmel (1907), which defined mobility as one of the keys for understanding modernity. It was in the

modern city that the founders of sociology first considered the contraction of social space, the density of transactions and the compression of social distance that comprised modernity (Sheller & Urry, 2000). The ultimate function of urban transport is to increase the accessibility of urban space, allowing the urban community to benefit from economies of urbanisation (Burlando, Canali, Musso, & Pelizzoni, 2000). Robert Park argued that along with the basic human urge to dwell in a place, mobility represented the ambition of mankind to "move freely and untrammelled over the surface of mundane things"(Park, 1925:156). It was still in the Chicago School the first wave of studies on social and urban consequences on automobility; a particular attention that was of primary importance more for the emerging transport sciences (based on an economic an engineering approach) than for the sociological ones (Lannoy, 2003). In fact, during the 1950s, the *social mobility* became one of the most important topics of sociology, while the territorial one became a prerogative of the transport sciences, which however dedicated exclusive attention to the macro traffic flows and the car (Colleoni, 2019). It was during the 70's that the study of mobility behaviour became relevant, as a consequence of the increasing private motorization and the emergence of urban and environmental policies and strategies dedicated to the modal shift and car-use limitations, which brought back the attention on the socio-economic dimensions of mobility. As James Faulconbridge and Allison Hui say in the introduction of their "Traces of a Mobile Field: Ten Years of Mobilities Research" (2016:2), "*in 2006, the future of the nascent field of mobilities research was shaped by editorial calls to join an interdisciplinary and empirically driven project. We argue that these initial framings of mobilities research were central in shaping what was to become a strategically diverse field*". In the United States it emerged a dedicated branch of studies dedicated to modal choice and its relationships with the characteristics of actors and places, which soon became popular in Europe too, with a renewed interest in the social determinants of travel demand and the study of people's movement (rather than traffic flows). The study of mobility took several directions, one of which was the one dedicated to daily mobility, no more only dedicated to origin-destination approaches, but with the aim to know more about the socio-demographic profile of actors and families and understand their mobility strategies (Colleoni, 2019; Gallez & Kaufmann, 2009).

1.2.2 Sustainable Transition Studies & New Mobilities paradigms

As said above, with the emergence of environmental studies and policies in the Seventies, the problematization of vehicular traffic and urban sustainability became more

prominent. In 1971, Wilbur Zelinsky developed an analytical approach to better understand the coevolution of social and technological processes and gain helpful insights into how to steer them along more sustainable trajectories (Caletrío, 2015). In his paper "The hypothesis of the mobility transition" (1971) he argues that mobility is a defining feature of modernity, and it is possible to find regular patterns of mobility in time and space: as a community experiences the process of modernization, higher rates of movement always occur; and the course of the mobility transition closely parallels that of the demographic transition (Figure 1.6). Thus, a key challenge for researchers is to describe these dynamics and relationships, taking into account a spatial and temporal perspective.

STAGE 1
Premodern traditional society
• Before the onset of urbanization
• Natural increase rates about to zero
• High levels of nomadism but very little migration

STAGE 2
Early transitional society
• Massive movement from countryside to cities
• Begin of the process of modernization
• Rapid rate of natural increase
• High rate of international emigration

STAGE 3
Late transitional society
• Urban-to-urban surpasses the rural-to-urban migration, with complex movements within the urban network (from city to city or within a single metropolitan region)
• Emergence of circulation and non-economic migration (environmental, educational, cultural/social migration)
• More people move in rather than out

STAGE 4
Advanced society
• Large increase of urban to suburban migration (begin of suburbanization process)
• Slight or zero natural increase

STAGE 5
Future super advanced society
• Almost all migration will take place between or within cities
• Declining population

Figure 1.6. Zelinsky Model of mobility transition. Source: personal elaboration from Zelinsky (1971).

In the last decade the analysis of sustainability transitions has become a distinct field of inquiry with a rapidly increasing interest in the research community (Markard, Raven, & Truffer, 2012). The "Sustainability Transition Studies" (STS) objective is to play a key role in creating new perspectives, approaches and understanding to help the society move in the direction of sustainability. The paper of Köhler et al. (2019) provides an extensive review on the research field of sustainability transitions, which has expanded rapidly in the last years. A central aim of transitions research is to conceptualize and explain how radical changes can occur in the way societal functions are fulfilled. The focus differs from long-standing sustainability debates at the "macro" level (e.g. changing the nature of capitalism or nature-society interactions) or the "micro" level (e.g. changing individual choices,

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attitudes and motivations)(Köhler et al., 2019). The unit of analysis is thus primarily situated at the "meso" level (Geels, 2004), such as innovation systems and socio- technical regimes, studying how system and regime structures are created and changed through the strategic interplay of different types of actors (Musiolik & Markard, 2011).

Among all the characteristics of sustainable transitions, which make them a distinct topic in sustainability debates and social sciences, there is the multi-dimensionality and co-evolution (as in Zelinsky's approach). Transitions are not linear processes but entail multiple interdependent developments which are the result of co-evolution of technologies, markets, user practices, cultural meanings, infrastructures, policies, industry structures, supply and distribution chains. A particular branch of this approach is the *geography* of sustainability transitions, which focuses on a spatial perspective trying to answer some questions like: i) Why do transitions occur in one place and not in another?; ii) How do transitions unfold across different geographical contexts?; iii) What is the importance and role of relations at different spatial scales for transition processes? (Hansen & Coenen, 2015).

In the field of transition research, Antal, Mattioli & Rattle (2020) are calling for more attention to *negative* trends, for example considering the several unsustainable trends which are not gaining sufficient attention, such as growing air travel (IATA, 2019) or the increasing market share of Sport Utility Vehicles (SUVs) (IEA, 2019). Further transitions research should be dedicated in understanding how unsustainable trends emerge, who drives them, and how research could help to curtail harmful socio-technological changes before they become entrenched.

Other than STS, a framework which appeared in the last decade and suits well with the approach of this study is the one of the Sustainable Mobility Paradigm (Banister, 2008) which, together with the New Mobilities Paradigm (Sheller & Urry, 2006) argue for greater attention to a range of behavioural, technological and policy approaches. In fact, according to Banister (2008), four transition lines are essential to sustainable mobility: travel mode choice, urban and regional planning, technology, and travel substitution. Both paradigms call for innovative thinking around the current urban form, for example modal shift, policies facilitating distance reduction and increasing efficiency through technological innovation. According to the authors, for a long time social sciences have been *static*, undervaluing the importance of movements, in particular failing to consider the overwhelming impact of the automobile: how it re-shaped the way of plan, build, travel, communicate (*ivi*). Urban studies for a long time have at best concentrated upon the socio-spatial practice for example of *walking* and *flânerie* (Nuvolati, 2013), not paying enough attention on the

movement, noise, smell, visual intrusion and environmental hazards of the car as a way to decipher the nature of city life (Sheller & Urry, 2000). Where the forms mobilities which occur into, across and through the city have been taken into account, it was generally to lament the effects of the car on the city (Jacobs, 1961; Mumford, 1981). The sociological concept of *automobility* (Urry, 2004) describes the continued, self-reinforcing dominance of privately-owned, petroleum-powered vehicles used primarily by single occupants. Urry described automobility as a global system, comprising the industrially manufactured object of the car, its social meaning as one major item of consumption, its economic meaning within the involved industries, services and patterns of dwelling, its dominating position with regard to other modes of movement and transportation, its cultural associations as well as its ecological impacts (ivi). The car system has produced an "individualised mobility based upon instantaneous time, fragmentation and coerced flexibility" (Urry, 2007:285), which is no longer sustainable.

What is argued by the New Mobilities Paradigm (Sheller & Urry, 2006) is that today, people, things, capital, information and ideas seem to be "on the move" as never before in history (Urry, 2007; Urry & Elliot, 2010). Mobilities in this context include physical, human travel and the movement of material objects as well as imaginative, or virtual, communicative travel through a variety of new and old media (Urry, 2007). Taking this observation as a point of departure, the New Mobilities Paradigm has challenged contemporary sociology by highlighting that movements – rather than stasis – are foundational to all social formations. Together with developments commonly framed as globalisation or post-Fordism (D Harvey, 1989; Lash & Urry, 1993), and combined with technological innovations and progresses, the order of movement itself appears to be in fundamental transition, entailing changed social formations beyond the nation state (Urry, 2000). As explained by John Urry (*ivi*), mobility is the cause and the consequence of changes in the organisation of the everyday life.

Going more in deep in the role of social sciences in the analysis of mobility, in the premise of "Climate Change and Society" (2011), Urry highlights the fact that physical and natural sciences have always dominated in the research field of climate change, and as a result, sociological research on climate change has not been given the attention that it deserves. "Most official reports are written by scientists for scientists and governments are uninformed by social sciences" (Dennis & Urry, 2009:8). But the nature of *social life* is central to the causes, the consequences and the possible mitigations involved in climate change. Thus, an understanding of the relationship between climate change and human behaviour is a critical element in developing a more sustainable future, creating just and

effective environmental policies, and keeping the society at the centre of climate change studies (Urry, 2011).

1.3   Trending topics in sustainable mobility research

1.3.1   Car dependence

In the last decade of researches on sustainable mobility transitions, it can be noted that there are some main recurrent topics that remain at the centre of the debate: car dependence, the theory of peak car, and more recently, the "three revolutions" (electric vehicles, autonomous vehicles, and sharing).

In fact, despite decades of progress for alternative and low-carbon fuels and technologies, most countries still remain locked-in to petroleum-powered auto-mobility (Axsen & Sovacool, 2019; Melton, Axsen, & Sperling, 2016; D Sperling & Gordon, 2010). The persistence of suburbanization, which created the "automobile city" (European Commission, 2019b), is still a representation of the enormous impact of car culture. Cities have lived a transformation from walking, to cycling and then automobile cities (Fieetsberaad, 2009). From 1900 onwards the bicycle, initially a recreational vehicle for a small élite, very quickly became a utilitarian mass product for the middle and lower classes (Fieetsberaad, 2009), but the rapid advance of the private car in the 1960s caused its sharp decline. The end of cycling as a daily practice is the result of a deliberate political choice in favour of individual motorization (Carré, 1998; Ortar & Vincent-Geslin, 2017).

This brought high levels of car dependence, which can be defined as the "testimony of the difficulty of moving away from the car system, despite the increasing awareness of the negative externalities" (Mo. Ve. Association, 2008:3). As Mattioli found in his research (Mattioli, 2014), a good indicator of the level of car dependence in a local area is to look at the composition of *carless households*. In peripheral and rural areas, they very often correspond to a marginal socio-demographic situation and are almost virtually immobile or reliant on car lifts (*forced* carless households). While in larger urban areas, where people are able to use modal alternatives to the car, thanks to the better provision of modal alternatives and the shorter distances to services and opportunities, the mobility gap between car-owning and carless households is considerably smaller (carless households *by choice*). In these areas the need to rely on car lifts and other surrogates of private car ownership is lower. Though, the role of the built environment – e.g. public transport quality and availability, place of employment, car accessibility, distance from railway – plays a

pivotal role in influencing mode choice, starting with *long term choices* (e.g. residential choice), to *medium-term choices* (e.g. own a car) and ending with *short term choices*, such as daily travel behaviour (Figure 1.7).

LONG TERM CHOICES

Residential choice

MEDIUM TERM CHOICES

Owning a car

SHORT TERM CHOICES

Daily travel habits
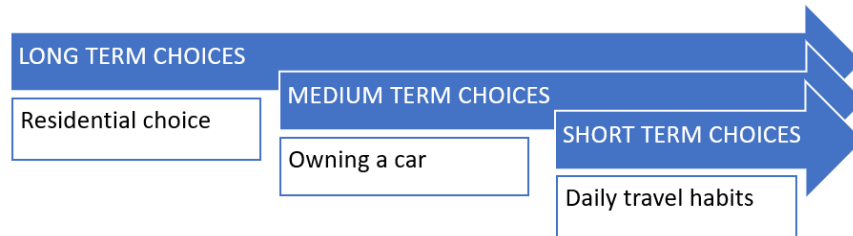
Figure 1.7. Role of the built environment in determining car dependence. Own elaboration from Mattioli (2014).

Furthermore, car dependence is not only about territorial characteristics but also about individual characteristics, e.g. being part of marginal social groups such as older or disabled people. That's why a powerful lens of analysis for car dependence is to divide it into three conceptual levels, as summarised by Mattioli, Anable, & Vrotsou (2016) on the basis of existing literature: car dependence as an attribute of individuals, society and/or the built environment, or particular trips, activities or practices (car dependent people, places and trips, Table 1.1).

Table 1.1. Three levels of analysis for car dependence (Mattioli, Anable, & Vrotsou (2016).

Level	Car dependent...	Characteristic of the...	Example
Micro	*people*	individual	old age
Macro	*places*	territory, location, environment	rural areas
Meso	*trips*	activity / trip purpose	transport of heavy loads

1.3.2 After the car? The hypothesis of "peak car"

Popular in the study of car use and ownership is the theory of "peak car". In 2011, Millard-Ball & Lee Shipper (2011) suggested that in Western Europe and North America a substantial change was happening in people's mobility. After decades of steady growth, car travel started to persistently fall or stagnate in the 2000s in many regions, especially in urban areas (e.g. France, Sweden, UK, USA, Japan, Australia, Germany and the Netherlands). The following year, Phil Goodwin (2012) did a systematic analysis of the

debate around the "peak car" phenomenon, offering three hypothetic views on the ongoing trends on car ownership and use:

- *The Interrupted Growth*: car use is still in long-term growth with only temporary interruptions due to economic circumstances, defined by three key drivers: income, population and the cost of motoring. Current assumptions on future changes in income, population and fuel price would suggest that car traffic will continue to grow for several decades in the future.
- *The Saturation Hypothesis*: car use has reached its peak and will show little or no further growth. In this scenario car use per capita has broadly already reached or is mostly close to the maximum possible level[4], because more car use does not give greater cost/time benefits. Traffic congestion and the alternatives offered by public transport, walking and cycling determine that peak.
- *The Peak Car Hypothesis*: car use has passed a turning point and is now in long-term decline, due to a complex combination of drivers in which economic influences are modified by policy, attitudinal, social, technological and cultural changes.

Which of these three views is more viable is still to be explored, focusing the analysis on the possible causes behind the trends. Indeed, the economic crisis of 2008 has undoubtedly contributed to car peak, but does not explain it fully, since in almost all countries it started before the crisis (Millard-Ball & Schipper, 2011). In a famous study, Kuhnimof et al. (2013), found that the decrease in young adults' attachment to car played a substantial contribution to the peak car – based on a research in travel trends since 1990 – and this was also sustained by another study conducted by Van der Waard et al. (2013) – because it was them in particular that showed the greatest tendencies to shift away from car and driving licenses, appearing less car-oriented than previous generations. The other main factors behind these trends found in literature are the increase of the quality and reliability of other modes (public transport infrastructure, frequency & comfort, cycle lanes) together with restrictive policies on car use, the increasing costs of licensing and drive (purchase and maintenance of a car), increasing orientation towards ICT based accessibility, as well as the growing popularity of urban areas, especially among higher income groups and opinion formers, changing fashions away from suburbs, and demographic changes like the prolonging of life-cycle stages, growth of immigration flows which bring different cultural

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[4] In this hypothesis, the saturation of the demand itself (number of cars owned) must also be taken into account; originally conceived as a household asset, the automobile has gradually come to reflect an individual's status, with the massive entry of women into the work force following World War II (Grimald, 2017).

attitudes and habits of travel, and ageing population; and finally changes in preferences, attitudes and opinions, resulting in a more pragmatic relationship with the car and greater environmental awareness (Chen, Le Vine, & Polak, 2014; Focas & Christidis, 2017; Goodwin, 2012; Goodwin & Van Dender, 2013; Grimald, 2017; Headicar, 2013; Metz, 2013a).

In this context it is also interesting to cite the work of Lee-Gosselin (2017) which analysed the evolution of public sentiment about the role of cars in cities, identifying different "car subcultures": the first two have existed for decades and are easily recognised for the strength of their sentiments , i) *Car-centred*, in which is valued above all the liberty to "drive where I want, when I want, to do what I please", and ii) *Anti-car*, namely emphatically against car as a source of many ills; then a third subculture is emerging in post-peak car contexts, which is iii) *Positive to live without cars*: characterised by positive sentiment towards not having to bother with all the financial and practical exigencies that include the management of a personal motor vehicle. This is less strong in ideology, but it's gaining ground especially thanks to the crucial role played by ICTs, which help to widen behavioural options.

Thus, using the words of John Urry (2004:36), even if the global system now seems so unchangeable, there are signs that it may tip into a "post-car" mobility system if a series of small changes will occur, impacting each other in a certain order:

> «*Any post-car system will substantially involve the individualised movement that automobility presupposes [with new flexible models of public mobility]. […] The days of steel and petroleum automobility are numbered. By 2100 it is unconceivable that individualised mobility will be based upon the 19th century technologies of steel-bodied cars and petroleum engines. A turning point will occur during the 21st century, when the steel and petroleum car system will finally be seen as a dinosaur (a bit like the Soviet empire, early freestanding PCs or immobile phones). When it is so, then it will be dispatched for good and no one will comprehend how such a large, wasteful and planet-destroying creature could have ruled the earth. Suddenly, the system of automobility will disappear and become like a dinosaur, housed in museums, and we will wonder what all the fuss was about. The turning point is unpredictable. It cannot be read off from linear changes in existing firms, industries, practices and economies. Just as the internet and the mobile phones came from nowhere, so the tipping point towards the 'post-car' will emerge unpredictably*»

1.3.3   The three revolutions: electric, shared & automated mobility

In recent years, hope for sustainability transitions has been attached to three particular innovations: electric vehicles (EVs), shared mobility and automated vehicles (AVs) (Axsen & Sovacool, 2019). These have been collectively called the "Three Revolutions" (Sperling, 2018) as well as "New Mobilities" (Sheller & Urry, 2006) or "disruptive technologies" among other terms (e.g., automated, connected, electric and shared, or ACES). Most literature in this field is coming from the United States.

What is electric, shared and automated mobility? It is easier to define electric and automated vehicles, which basically implies the different source of energy in the first case, and the absence of a driver in the second case, referring to vehicles. EVs are discussed first because they represent artifacts that replace another artifact (internal combustion engine vehicles), and for some authors (Sperling, 2018) they probably shouldn't even merit the label "disruptive": the car companies are simply switching to a new power plant; while the other two innovations have both the potential to be far more transformative — even revolutionary – even if how they will unfold is less certain. AVs are self-driving cars, which are now nearing commercialization (most new cars in Europe, the United States, Korea, and Japan are already partly automated). In 2010, Google announced it had a car that was safely self- driving around San Francisco— with no special roadside infrastructure or city retrofitting (Sperling, 2018).

It is more complicated to define *shared* mobility, which implies different applications of the concept: car sharing, carpooling, ride-hailing.

- *Car sharing* refers to a kind of short-term car rental, aimed at replacing car ownership. Instead of owning a car, becoming a car share member gives access to a fleet of different types of cars that can be paid pay per minute of use.
- *Carpooling* is an arrangement in which a passenger travels in a private vehicle driven by its owner, for free or sharing the trip expenses, when commuting or taking a trip, instead of riding alone.
- *Ride-hailing* encompasses a range of companies and services such as the popular Uber or Lyft, including traditional taxis and car services. The overarching idea of ride-hailing is that a customer hires a driver to take them exactly where they need to go, something accomplished by hailing a taxi from the street, calling up a car service on the phone, or virtually hailing a car and driver from an app.

It is easy to find overly positive literature in the field of "the three revolutions". Currently too little of the research in this field has focused on behavioural realism, while it is common to see reports and modelling studies with idealised scenarios of shared, electric

and automated vehicles, which assume that people will adopt and use new technology system as modelled by the researchers (Axsen & Sovacool, 2019). A socio-technical transition (thus involving substantial technical and social changes) to one or some combination of these innovations could indeed play an important role in a transition toward a post-private-car system, substantially impacting the environment, energy use, and social well-being, but it needs a proper understanding of what users actually want, why, and how that might change and develop over time.

Ride-hailing services such as Uber or Lyft in particular, namely the latest model of "shared mobility", are starting to be object of critical studies and debates about their role in traffic congestion and car use. The widespread concern is about their effects on traffic congestion and vehicle emissions and also about their potential to undermine public transit and taxi services (Schaller, 2017). In fact, as found in a research conducted in New York (ivi), it added significant vehicular travel and mileage on city streets; and even considering the offer of pooled versions of ride-hailing services, the exclusive-ride trips still predominate, with most customers are coming from transit, walking and biking. These findings are supported also by Clewlow (2017). In this report based on data collected in major cities across America, it's been found that a large portion of travellers are substituting ride-hailing in place of public transit, biking, and walking trips, or would not have made the trips at all, adding vehicles to the road in major metropolitan areas. The adoption of ride-hailing is estimated to have grown to more than 250 million users globally within their first five years of existence, capturing a much broader swath of the population if compared with traditional car sharing services (Axsen & Sovacool, 2019). The *substitutive* versus *complementary* nature of ride-hailing, as it is for car sharing, varies greatly based on the type of transit service in question, but on average, ride-hailing hailing appears to reduce bus ridership and complement commuter rail (*ivi*).

With regards to car sharing, it's been widely spoken on its potential to reduce car ownership as a way to improve air quality, reduce congestion, and reduce greenhouse gas emissions, with the aim to gradually substitute private vehicles with shared fleets. In fact, it appears more effective to influence car purchase rather than reducing car use, since car ownership is a precursor both to trip generation (vehicle miles travelled) and to mode choice (Goetzke & Weinberger, 2012b). Nevertheless, there are contrasting opinions about car sharing impact on car ownership and use. A research in the Netherlands found that amongst people subscribed to car sharing services there was 30% less car ownership and fewer car km driven than prior to car sharing; and that the shared car mostly replace a second or third car (Nijland & van Meerkerk, 2017). Other researchers found that amongst

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car sharers, who already owns a car is less likely to dispose of his/her car, while respondents without a car are more likely to give up purchasing a car after experiencing car sharing (D. Kim, Ko, & Park, 2015). Whether car-sharing entrenches automobility or not varies on the type of service, context, life phase, attitude: some members become "serious" sharers, doing it consistently, whereas others are more experimental and "playful," only doing it occasionally (Priya Uteng, Julsrud, & George, 2019).

Instead, worries on AVs primarily include the fact that it may encourage urban sprawl: by replacing the burden of driving with time that may be spent for productivity, entertainment, or even for sleeping, AVs may enable people to live further from work, increasing commute distances and energy expended (Milakis, Van Arem, & Van Wee, 2017). Studies confirm that automated vehicles can induce additional travel demand because of more and longer vehicle trips (*ivi*).

To conclude this section: what is generally recognised in literature, is that benefits will come only with the synergistic effects between vehicle automation, sharing, and electrification. It is possible that these innovations could be integrated in more ideal ways to indeed achieve a broader set of sustainability goals, including improved liveability, equity of access, diversity of choice and economic resilience (*ivi*). For example, AVs could enable densification in urban cores as the need to own, drive, and park private vehicles declines because of access to *shared* AVs (Spurlock et al., 2019). With the right model, it is also possible that ride-hailing could serve as an effective solution in existing suburban areas where personal vehicles dominate travel; but without significant coordination between cities, public transit agencies, and ride-hailing services themselves, this optimistic scenario is unlikely to materialize (Clewlow, 2017). For example, a particularly worrying theme is that any combination of these innovations that lowers travel costs will induce a rebound effect that increases overall travel, perhaps inducing more vehicle travel and even vehicle ownership (if competing with active modes or public transport). Such changes would only reinforce automobility and many of its negative societal impacts (Axsen & Sovacool, 2019). What's more is that most studies have found that users of ride-hailing and car-sharing services tend to be disproportionately younger, higher income, and college educated with fewer or no children at home (Shaheen, Chan, & Gaynor, 2016). In parallel, many recent studies have found that users of EVs tend to be disproportionately male, younger, higher income, and college educated with fewer or no children at home (*ivi*). This suggests the risk that these services will raise equality issues, representing *élite* services ("You are what you can access").

1.4 Factors affecting travel behaviour and modal choice

1.4.1 Epistemology

To understand the motivations underlining the decline in car use and ownership, it is necessary to introduce the epistemological basis of modal choice research and the main theories around the factors affecting travel behaviour. There is a large literature on factors which can influence travel behaviour and limit the extent to which people chose how to travel. Modal choice is a complex decision process, determined by a wide range of factors deriving from different disciplines (economy, sociology, geography, psychology).

Traditionally, in transport studies it has been common to adopt as a mainstream method to study modal choice the utilitarianism approach, especially with reference to Mill & Bentham (1987). It follows the rational choice theory, in which action is explained by the pursuit of individual interests. The unit of analysis is the individual behaviour, and the assumption is that travellers take decisions based on utility maximization attained by minimizing travel time and costs, as typical from micro-economic approach (Shen, Sakata, & Hashimoto, 2009).

In contrast, in the sociological literature, the units of analysis are often "social practices", embedded in the *theories of social practice*, which builds on Giddens, Bourdieu, Schatzki and others (Köhler et al., 2019; Williams, 2015). These theories take their roots from the concepts of agency and structure (Giddens, 1984), decentralising the individual and its personal behaviour and placing *practices within the society* at the centre if analysis. The concept is that what people do is never reducible to mere individual attitude or choices; human activities are shaped by social structures (rules and meanings), which are in their turn reproduced by the flow of human action; though implying that transport practices for example cannot be understood without relating these to other daily usage practices. In the field of sustainability transitions, this approach is committed to focus on practices - such everyday eating or mobility - as the central units of social scientific analysis, with the aim to go beyond the dualisms of holism/individualism (Shove, 2010). By drawing attention to the endogenous dynamics of practices through stability and change in cultural conventions, habits, practitioner know-how and technologies, these studies of everyday life help to explain patterns of everyday practices and point to the potential sites for intervention to facilitate transitions (Spurling, Mcmeekin, Shove, Southerton, & Welch, 2013). With this view, the *socio-geographical approach* explicitly introduces a spatial component, starting from the activity schedule of individuals or households to explain

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modal choice, treating the demand for travel as something derived from the need to pursue activities distributed in space and time (K.W. Axhausen, 2005; Bhat & Singh, 2000; Meister, Frick, & Axhausen, 2005). Furthermore, Shove et al. (2012) argument is that practices are constituted by three interconnected categories: *materials*, *competences* and *meanings*. Following this framework, for instance, driving involves *materials* (e.g. cars), *competences* (e.g. ability to drive) and *meanings* (e.g. driving as means of independence) (Redshaw, 2017). Suggestions on future research directions on practice theory on sustainable transitions (Köhler et al., 2019) require both quantitative approaches (e.g. concerning social stratification through survey data or temporal rhythms using time diaries), and comparative research across domains of practice and in different social, cultural and geographical contexts to understand contrasting trajectories and dynamics of change in everyday life.

A third approach to predict mode choice comes from psychology, and it is the Theory of Planned Behaviour – TPB – (Ajzen, 1991), together with the theories on Habitual Travel Choice (Gärling & Axhausen, 2003). TPB states is that in travel research methodology and policy interventions, it is often overlooked that the combination of instrumental, situational and psychological factors affecting travel choice will differ in distinct ways for distinct groups of people (Anable, 2005). In fact, in psychological research, models are based on the attitude–behaviour relationship, while in the transport sector the users' segmentation based on such relationship has been rare (Pronello & Camusso, 2011). In travel behaviour research the sample populations examined are rarely grouped according to their motivations, psychological make-up or world views, where attitudes are not only based on objective measurements, but also taking into account subjective aspects (Bamberg, Ajzen, & Schmidt, 2003; Fyhri & Hjorthol, 2009; Hine & Scott, 2000; Kajita, Toi, Chishaki, & Matsuoka, 2004; Lang, Collins, & Kearns, 2011; van Acker, van Wee, & Witlox, 2010). For example it has been suggested that all travel choices involve the interaction of three overarching factors: obligations (What journeys do I *have to* make?), opportunities (How *can I* make those journeys?), and inclinations (How *would I like* to make those journeys?)(Stradling & Anable, 2008). Conversely, this approach goes over the classic socio-demographic segmentation and uses more complex, statistically derived clusters of characteristics, based on the fact that users' choices and behaviour do not often seem to follow an economic logic or a fully rational thought (Anable, 2005; Pronello & Camusso, 2011). The TPB is based on the concepts of *attitudes* (which can be defined as positive or negative evaluations or beliefs held about something), perception of social norms, and perceived behavioural control (Ajzen, 1991) that, in turn, may influence one's behaviour.

These studies have generally concluded that the choice of travel mode is largely a reasoned decision related particularly to attitudes and perceived barriers to behaviour, and are all based on the fact that the same behaviour can take place for difference reasons; and same attitudes can also lead to different behaviours (Bamberg, Ajzen, & Schmidt, 2003; Forward, 1998). On the other hand, the field of psychology also offers the theories of Habitual Travel Choice (Gärling & Axhausen, 2003) – which focus on the learning process that makes travel choice habitual: if habit is defined as the repeated performance of behaviour sequences, it must be asked how a person arrives at those sequences. In particular, the aim is also to understand how habits are broken, and how choices become deliberate and rational again (e.g. how to break and replace car-use habits?). In fact, it appears very useful in transport planning to analyse how habits and acquired environmental knowledge influence the implementation of policies.

Finally, following the acknowledgement of the central role of habits for daily travel choices and the relatively high stability of travel behaviour over longer time periods, ad additional stream of research has been put forward over the last decade: *life course approaches* to travel behaviour, often labelled as *mobility biographies*, studies stability and changes in travel behaviour induced by key events over an individual's life course and considers how life events themselves are influenced by travel preferences (Chatterjee & Scheiner, 2015; Müggenburg, Busch-Geertsema, & Lanzendorf, 2015; Scheiner, 2017; Scheiner, Chatterjee, & Heinen, 2016). Scheiner – one of the prominent scholars in this field – argues that travel behaviour should be investigated in concert with other domains of an individual's life course, and proposes a framework as a starting point to study mutual dependences among relocation, mobility, and preferences at various time points over a long period, involving concepts like *residential self-selection* – which concerns the relationships between travel behaviour and the built environment, when people choose where to live based on their travel needs and preferences (Cao, 2014), and *linked lives*, often approached with an inter-generational perspective (which will be further explained in par.2.1).

1.4.2 Determinants of travel behaviour in literature

In 2013, De Witte et al. (2013) did a comprehensive review on the determinants of travel behaviour among different approaches (as previously explained: from rationalist to sociological and psychological approaches). Therefore, what are the determinants of travel behaviour? Many variables do not meet a homogeneous consensus in literature around their influence on modal choice. For example, it needs to be considered the interaction between

age and social status (varying during the lifetime), car ownership (strongly related with car use) and physical ability to drive (which declines in old age), even if traditional travel demand modelling assumes travel activities are age-related and largely shaped by employment patterns, which also impact residential choices (Krizek, 2006; Krizek & Waddell, 2002); for what concerns gender, some studies report that men are more likely to use the car (Limtanakool, Dijst, & Schwanen, 2006; O'Fallon, Sullivan, & Hensher, 2004), while others that is women who use the car more (Brown, Werner, & Kim, 2003). It appears that the interdependency between gender and other factors (e.g. employment status) is more determining than gender itself, as it is for example for education.

The variables around which several studies agree on their role in modal choice are:

- *Income*, which is classified among the more important determinants of modal choice. Several studies indeed agree that modal choice is income related, and that it is positively related with car ownership, use and solo-driving, and inversely with public transit use and ride-sharing (Bresson, Dargay, Madre, & Pirotte, 2004; Dargay, 2007; Lyons, Chatterjee, Beecroft, & Marsden, 2002; Nolan, 2010; Paulley et al., 2006; Schafer, 2000; Spurlock et al., 2019).

- *Household composition* is also one of the determinants more frequently studied and more often found significant. In general it is found in literature that as the size of a household increases, there is a higher probability of travelling by car (Cirillo & Axhausen, 2001; Palma & Rochat, 2000); especially the presence of children increases the utility of car use - in particular for women (Sandra Rosenbloom, 1993) – which in turn has a significant negative impact on public transport use (Cirillo & Axhausen, 2001; Limtanakool et al., 2006). It has long been recognised that when young adults find work or have children their transit use tends to decline (Delbosc et al., 2019; Scheiner & Holz-Rau, 2013)

- *Car availability*: there is wide literature on the increasing probability to drive with the increasing amount of cars in the household; car ownership is a precursor both to trip generation, mode choice and vehicle miles travelled (Cirillo & Axhausen, 2001; Goetzke & Weinberger, 2012a; Goodwin et al., 2004; Kenworthy & Laube, 1996; Limtanakool et al., 2006).

- *Level of urbanization*: urban areas (with high density) are better served with public transport, increasing efficiency and frequency, which plays a crucial role in transit usage and mode choice. Also they have enhanced possibilities for walking and cycling while rural areas are more dependent on private transport (Kenworthy & Laube, 1996). Urbanization is also connected to a mixed land-use, which together with the proximity to infrastructures and services, lowers the probability of driving (Cervero, 2002; Krizek & Waddell, 2002)

Looking at the "meso" aspect of mode choice (cfr. par. 1.3.1), regarding the link with travel motive, literature research gives some general insights: according to Limtanakool et al. (2006) and O'Fallon et al. (2004), private car use is very prominent for a business traveller. It has also been found that for short social/recreational trips, the softer modes (walk and bike) are primarily used (Pucher & Renne, 2003). For commuting trips the share of public transport is consistently higher than for other travel motives; while for longer leisure trips, the car appears to be the most typical mode (Fyhri & Hjorthol, 2009; Vande Walle & Steenberghen, 2006).

There is also to be taken in consideration the level of *information* of travellers: people do not want to spend too much time and effort on their modal choice decision. Up-to-date and easy access information is particularly important for public transport use, where information is an important indicator of public transport quality (Grotenhuis, Wiegmans, & Rietveld, 2007). Lack of information and motivation, and incorrect perceptions of the alternatives to the car, represent significant barriers to modal shift (Ker, Ryle, Wall, Brög, & Erl, 2009).

Finally, there are *socio-psychological indicators* that can determine the modal choice process, such as positive or negative *experiences* in the past with some modes that influence the choice in the present; or the *familiarity* with some means of travel, namely the knowledge users have developed with the modes at their disposal, which facilitates their use. The use of public transport in the past may give people the skills and confidence to do so in the future (Brown et al., 2003). And this is directly connected with *habits*, since inertia plays an important role, and switching to other travel modes requires learning new routines (increasing the transaction costs of searching and processing information about alternatives)(Gärling & Axhausen, 2003), and also *perceptions*, given that travel time and cost can be perceived differently for alternative transport modes (De Witte et al., 2013).

About the factors influencing walking or cycling in particular, what emerges across multiple studies, is that walkable/cycling environment is determined by both the physical and visual experience. The main factors include *aesthetics* (parks, trees, shade), *safety* (lighting, traffic, absence of obstacles) and convenience of *nearby facilities* (shops, schools), and the confidence that paths are present and form continuous and integrated network that

allows linkages between destinations such as public transport, shops and parks (Pikora, Giles-Corti, Bull, Jamrozik, & Donovan, 2003). In fact, more pedestrian friendly neighbourhoods are usually linked to fewer Vehicle Miles Travelled (VMT), and the same happens in higher density areas and better access to transit (Caiello, 2018; Holtzclaw, 1994).

1.5 European targets and policies

1.5.1 Vision

After the introduction of the role of transport in the environmental crisis, and considering all the theories and studies on car dependence and peak and travel behaviour, it is reasonable to end the chapter with an overview of what has been done and planned in terms of policies, considering in particular the European area.

As the latest IPCC report claims (Intergovernmental Panel on Climate Change, 2018), human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, and it suggests to limit the global warming to 1.5°C in order to prevent the adverse consequences of a higher rise, which will substantially reduce the standard of living, the capabilities of life around the world and overall population, especially hitting the global South (Dennis & Urry, 2009). This would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems, with a substantial reduction of carbon emission and a reorganisation of social life. The transport sector itself has a substantial role in all emission and pollution reduction strategies: it represents the intersection between technological innovation, national and European policies, market dynamics and human behaviour (Poggio, 2018).

What is European Union doing in these terms? Under the COP 21 UN Framework Convention on Climate Change, EU has committed itself to significantly reduce CO2 emissions, in particular from transport. By 2030, transport is expected to reduce its emissions by 30% when compared with 2005 levels (European Commission, 2018a). The European Commission has adopted a long-term climate plan that calls for the EU to become the first major "climate neutral" economy, with emissions set to become zero by 2050, investments to ensure a just and inclusive transition into a sustainable European

economy and to achieve the goals of the Paris Agreement[5] which are also in line with UN Sustainable Development Goals[6] (European Commission, 2019a). To do this, it's been proposed a European Climate Law[7] turning the political commitment into a legal obligation and a trigger for investment, which include investing in environmentally-friendly technologies, supporting industry to innovate, rolling out cleaner, cheaper and healthier forms of private and public transport, decarbonising the energy sector, ensuring buildings are more energy efficient, and working with international partners to improve global environmental standards. The Commission will also propose to revise by June 2021 the legislation on CO2 emission performance standards for cars and vans, to ensure a clear pathway from 2025 onwards towards zero-emission mobility (*ivi*).

However, this objective seems very ambitious in the light of recent developments. As already said above, lthough emissions fell in 2008 due to the economic downturn, they subsequently picked up again as economic growth resumed (Crozet, 2019). The plan puts high importance on implementing strategies in *cities*, since 75% of the EU's population lives in urban areas, and it points to low-carbon urban mobility options as a key element. They also represent areas which have a great potential for improvements: *"City planning, local public transport, safe cycling and walking paths, new delivery technologies, Mobility as a Service such as car and bike sharing services, and alternative working schemes such as teleworking will all alter the ways in which people and goods move from one place to another"* and thus contribute to climate neutrality and better quality of life for citizens (European Commission, 2018:11). It calls for stronger interactions between transport,

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[5] The Paris Agreement builds upon the Convention and for the first time brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort. The Paris Agreement entered into force on 4 November 2016, thirty days after the date on which at least 55 Parties to the Convention accounting in total for at least an estimated 55 % of the total global greenhouse gas emissions have deposited their instruments of ratification, acceptance, approval or accession with the Depositary. Source: United Nations Framework Convention on Climate Change (UNFCCC) website https://unfccc.int/

[6] These goals were set in the United Nations' (UN) 2030 Agenda for Sustainable Development, covering the social, environmental and economic development dimensions at a global level. Source: UN website https://www.un.org/sustainabledevelopment/sustainable-development-goals/

[7] "Proposal for a Regulation Of The European Parliament And Of The Council establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law)", available at:
https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020PC0080&rid=1

digital and electricity networks to offer the necessary infrastructure for a transition towards net-zero emissions – to facilitate transitions in behaviours – plus the promotion of synergies between regulatory measures, corporate responsibility initiatives and emerging societal trends to make them support each other, allowing for rapid change.

1.5.2   What has been already done

In Europe, CO2 emissions levels and air quality has seen a moderate improvement in the last decade (EEA, 2017), thanks to environmental policies and technological improvements – for example limits imposed for air pollution[8] and large investment plans on high speed railway system[9] – even if concentrations of particulate matter (PM) continued to exceed the EU limit values in large parts of Europe in 2017, with about 8% of the urban population in the EU28 exposed to levels above the annual limit value (EEA, 2019). In fact, despite a relatively high proportion of people walking and cycling in some European countries, and more and more cities turning their transport planning approach, the car generally remains the dominant mode of transport in Europe (EEA, 2015). Crozet (2019) raised the question of the general failure of decades of modal shift policies; as observed from other authors, the field of sustainable transport policy remains characterised by a large gap between goals and accomplishments (Bache, Reardon, Bartle, Marsden, & Flinders, 2015; Schwedes, 2011). The effectiveness of conventional policy measures (whether hard or soft) seem to be limited (Calafati, 2020); soft measures such information programmes and awareness-raising schemes seems only to influence marginal changes in behaviour or over small geographical and temporal scales of application (Cairns et al., 2008) even if there is some evidence that hard regulatory measures have contributed to an improvement in average energy efficiency (new car CO2 emissions are 33.1% lower than 2000 levels (SMMT, 2018). This because transport is seen to be an essential activity, so individual and firms are insensitive at pricing and other measures such as information when it comes to transport decisions, and this is well explained in economy by the principles of elasticity and rational behaviour (Banister et al., 2012).

It is evident that, looking at the diverse territorial distribution of effects, while car remains the dominant mode in general, in *city centres* vehicle traffic and emissions did fall,

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[8] EU car regulation EC443/2009 for CO2 reductions in the motor manufacturers: NO2 (200 mg/m3 /h; 40 mg/m3 /yr), PM10 (50 mg/m3) and PM2,5 (25 mg/m3).

[9] In 2011, the Transport White Paper (European Commission, 2011) planned to 1) halve the use of conventionally-fuelled cars in urban transport by 2030 and phase them out in cities by 2050, and 2) to have the majority of medium-distance passenger transport to go by rail by 2050.

as well as public transport and soft mobility have developed. More and more cities in Europe have turned their transport planning approach, abandoning the idea of providing space to growing traffic volumes in favour of putting the actual city's and citizens' needs at the centre of development, taking traffic out of the urban space to create a more liveable city. Some examples are the cities of Munich, Berlin, Hamburg, Vienna, and Zurich, which have significantly reduced the car share of trips over the past 25 years. The key to their success has been a coordinated package of mutually reinforcing transport and land-use policies that have made car use slower, less convenient, and more costly, while increasing the safety, convenience, and feasibility of walking, cycling, and public transport. Or Hamburg, Oslo, Helsinki, and Madrid that have recently announced their plans to become (partly) private car free cities, implementing policies to significantly reduce private car use in city centers (Nieuwenhuijsen & Khreis, 2016). Recently the debate has also been set around the topic of Fare-Free Public Transport (FFPT), which has seen several experimentations in European cities such as Tallinn and Hasselt (Belgium) and since February 2020 also in the first country-wide experimentation in Luxembourg (De Witte et al., 2006; Fearnley, 2013; Štraub & Jaroš, 2019).

The idea of putting people at the centre of urban mobility planning emerged with the Sustainable Urban Mobility Plan (SUMP) concept over the last ten years across Europe. While during the last century transport planning focused on providing space for the emergence of cars, the SUMP tried to introduce an integrated planning approach to urban mobility development, putting emphasis on accessibility for all, quality of life and supporting cleaner transport options (Kollinger, 2019). The emphasis is put on walking and cycling, that other being the most sustainable ways of moving, represent a fundamental moderate-intensity daily activity for health – as WHO guidelines for physical activity recommend – becoming a field of interest also of medicine, which tries to understand the influence of policies and the environment on physical activity, namely their potential to influence individual behaviour and thus influence health (Pikora et al., 2003). In fact, promoting a shift from motor vehicle travel to cycling is expected to confer substantial health and environmental benefits (Department for Transport, 2011; Maizlish et al., 2013), also thanks to the introduction of new services such as bike sharing systems, which are increasingly popular around the world and allow short-term bicycle rental between docking stations, making cycling a form of public transport. Such schemes have the potential to confer important health benefits (Rojas-Rueda, Nazelle, Tainio, & Nieuwenhuijsen, 2011; Woodcock, Tainio, Cheshire, O'Brien, & Goodman, 2014), and have also been useful in normalising the image of cycling, with the potential to increase the visibility of people

cycling in everyday clothing and reduce perceptions that cycling is "risky" or "only for sporty people" (Goodman, Green, & Woodcock, 2014).

EU policies in the field of mobility have included communication of best practices, campaigning and increasing awareness of sustainable mobility (CEC, 2009), as well as knowledge-support for the development of sustainable urban mobility plans, including The Urban Mobility Observatory[10] (European Commission, 2013b). Behavioural change and its promotion have highly different starting points across different individual countries in Europe, or groups of countries, with comparable patterns. More knowledge of these differences is required to develop European policies on sustainable urban mobility (Haustein & Nielsen, 2016).

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[10] The Urban Mobility Observatory (ELTIS) facilitates the exchange of information, knowledge and experiences in the field of sustainable urban mobility in Europe. It is aimed at individuals working in transport as well as in related disciplines, including urban and regional development, health, energy and environmental sciences. Eltis is Europe's main observatory on urban mobility. Source: https://www.eltis.org/

2 Gross polluters & Smart travellers? A cohort approach

This chapter goes into detail on the protagonist of the research, the two generations analysed. It starts introducing the cohort approach (par. 2.1), explaining i) the connection between travel behaviour impact and socio-demographic composition of the population, which builds on the balance of behaviours of different social groups, and ii) the ratio behind the definition and the study of generations. Then with par. 2.2 and 2.3 the chapter dives into the literature around the two cohorts analysed, giving an overview on i) who are them and what defines them as a generation in terms of socio-demographic, contextual, and behavioural characteristics; and ii) why these two cohorts in particular have been chosen for this comparative study, focusing on the existing literature on what are the origins and implications of their current and future behaviour for the environment and society.

Question	Content	Paragraph
What approach has been implemented in this research?	Characteristics and ratio of the cohort approach; connections between travel behaviour and socio-demographic structure	Par. 2.1
Who are Millennials and why is it important to study them?	Characteristics and peculiarities of this generation (socio-demographic, contextual, and behavioural characteristics)	Par. 2.2
Who are Baby Boomers and why is it important to study them?	Characteristics and peculiarities of this generation (socio-demographic, contextual, and behavioural characteristics)	Par. 2.3

2.1 Introducing the cohort approach

As seen in the previous chapter, transport is seen to be fundamental in maintaining and enhancing the global economy. This is translated in a persistent research in less energy-intensive technological solutions to allow the continuation of the growth in mobility. But technology improvements are not enough to mitigate the impact of human mobility on the environment: a deeper understanding of behaviour change dynamics and the mobility necessities of people is crucial to reach the aim of a low carbon economy and society. The pace and extent of a transition towards more sustainable ways of travel will highly depend on factors such as sociodemographic characteristics of the population, the context, the local governance capabilities (Bouton, Hannon, Knupfer, & Ramkumar, 2017).

As explained in the paragraph dedicated to travel behaviour studies, mode choice is affected by a series of factors. As a matter of fact, belonging to a specific cohort, grown with the same historical background, could have some consequences in determining some common personal & contextual characteristics which imply, in their turn, some similarities in travel behaviour (Garikapati, Pendyala, Morris, Mokhtarian, & McDonald, 2016). As already introduced in par. 1.4.1, the study of cohorts is contemplated in *mobility biographies* studies (Chatterjee & Scheiner, 2015). As a matter of fact, a cohort is a group who experience a particular event in the same period, and experience particular social change within a given culture in the same sequence and at the same age. People belonging to a cohort may reinforce each other's attitudes and behaviour by way of developing social norms (*ivi*). The life course of individuals is embedded in, and shaped by, the historical times and places they experience over their life-time. This signals the importance of cohort effects where distinctive formative experiences are shared at the same point in the life course by birth cohorts (ivi). Furthermore, intergenerational influences such as from parent to child and viceversa can be highly influential, as people's life courses are not isolated from other people's life courses: the dimension of these embeddings is studied in sociology and psychology using the term *linked lives* (Chatterjee & Scheiner, 2015; Elder, Johnson, & Crosnoe, 2003). Haustein, Klöckner, & Blöbaum (2009) showed that communication with parents about the environmental impact of travel mode choice are relevant for car use; for example Döring, Albrecht, Scheiner, & Holz-Rau (2014) used a sample of German students, their parents and grandparents to study intergenerational influences in residential choice, travel attitudes and commute modes. There is evidence for such transmission of behaviour from parents to children in residential choice (Blaauboer, 2011; Myers, 1999) as well as in demographic life paths (Liefbroer & Elzinga, 2012), suggesting the relevance of *linked lives* in terms of interpersonal links in mobility biographies.

But what defines a generation or cohort? A *generation* typically refers to groups of people born over a 15-20 years span, with boundaries defined by a range of factors including demographics, attitudes, historical events, popular culture, and prevailing consensus among researchers (Pew Research Center, 2015). As stated by the Pew Research Centre, it takes time for popular and expert consensus to develop the precise boundaries that demarcate one generation from another; they represent analytical constructs and should be thought of as guidelines and useful tools for analysis, rather than hard distinctions.

Cohort analysis allows to track a group of people over time, giving researchers a tool to analyse changes in views, providing a way to understand how different formative

experiences interact with the life-cycle and ageing process. While younger and older adults may differ in their views at a given moment, age cohorts allow to go further and describe how the trajectory of views might differ across age cohorts (*ivi*).

The factors associated with generational differences can be complex and overlapping. According with the age-period-cohort analysis (APC analysis), there are three separate effects that can produce differences in attitudes between age groups: age effects, period effects and cohort effects (Brady & Elms, 1999; Dinas & Stoker, 2014; Norval, 1976; Winship & Harding, 2008)(Table 2.1). *Age effect* refers to the changes in individuals during ageing in any given length of time period, which imply a series of social and biological transformation processes and could be associated with key age-associated life events such as education-to-employment transition or new household formation, and physical decline (Scheiner et al., 2016; Yang & Land, 2013); *period effect* refers to the consequences of changes in contextual factors over time such as economic fluctuations, labour market contractions or urban growth, or also the incoming of new mobilities, that simultaneously influence individuals with different age and cohorts groups (An, Heinen, & Watling, 2021; Yang & Land, 2013); finally, the *cohort effect* represents temporal variations across groups of individuals whose births fall in the same interval, which then move through life together, confronted by the same historical, social, and economic events at the same age and same point in time (Blanchard, Bunker, & Wachs, 1977; Newell, 1990).

Separating out the independent effects of age, period, and cohort can be difficult because any two of these effects is a linear function of the other (e.g. cohort=period+age).

Table 2.1. The Age-Period-Cohort effect. Elaboration from Pew Research Center (2015).

	Description	Example
Age effect	Differences between younger and older people are largely due to their respective positions in the life cycle.	*Young people are less likely than older adults to vote and engage in politics. As people age, they vote at higher rates and their level of political engagement rises.*
Period effect	When events and circumstances (e.g. wars, social movements, economic booms, scientific or technological breakthroughs) as well as broader social forces, simultaneously impact everyone regardless of age	*The economic crisis of 2008 coincided with a general drop in car use and CO2 emissions (cfr. par. 1.1).*

Cohort effect	Differences between generations can be the byproduct of the unique historical circumstances that members of an age cohort experience, particularly during a time when they are in the process of forming opinions. In some cases, this may be the result of a *period effect* an older generation experienced that subsequent generations did not; in other cases, a historical moment can have an outsize effect on members of one generation, because it occurs during a key point in their *life cycle*, such as adolescence and young adulthood, when awareness of the wider world deepens and personal identities and value systems are being strongly shaped.	*Millennials came into the population more supportive of allowing gays and lesbians to marry legally than older generations, and those greater levels of support have persisted over time.*

It is important to notice that *cohort effect* should not be confused with *age effect*: as already seen in paragraph 1.4, indeed age has an effect on travel behaviour. Various studies have shown that, with age, and especially after retirement, travel activity tends to decrease linked to a reduced willingness and/or ability to drive (Bailey, 2004) and to the fact that older people use private cars less often for transportation (Paez, Scott, Potoglou, Kanaroglou, & Newbold, 2007; Sandra Rosenbloom, 1995). However, many of the descriptions on how older adults travel, are largely based on older data that is mainly representative of older cohorts of seniors (Figueroa, Nielsen, & Siren, 2014). The age and life-cycle related spatial patterns are not biologically determined (Hopkins & Pain, 2007) and are likely to be influenced by cohort differences (Hjorthol, Levin, & Sirén, 2010; Siren & Haustein, 2013). Because of the so called *demographic metabolism* (continuous replacement of older cohorts with new cohorts with new birth background and life trajectories), the society constantly renews its population composition, maintaining a level of flexibility that may be open to changes (Ryder, 1985). That's why, along this line, relying on insights into cohort effects can help to understand not only current pictures of different sub-groups but also future trends in society (An et al., 2021).

Nevertheless, the challenge towards a transition away from car dependence has to deal with the socio-demographic changes occurring in post-industrial societies. Demographic trends seem to be more important than economic developments or technological change in determining travel trends; according to Metz (2012, 2013) in developed countries the

demographic change will be the main determinant of future travel demand and traffic levels, since the changing demographic composition of road users will have an impact on travel demand, infrastructures and needs, traffic safety and the climate. Also Stokes (2013) reports that demographic shifts, and changes in residential location preferences, will play a major role in shaping future levels of car access and use.

The society in general is ageing, and it can be assumed that older generations will be using the car less during their retirement than they did when they were of working age, but more than the current generation of retirees. On the other hand, younger generations are expected to use a car less than comparable generations did before but, since their share in total population is falling, it is questionable whether the impact on total demand will be visible. The overall balance will largely depend on the difference between the additional car travel demand from the forthcoming more mobile older generations and the decreased demand from the future, less car-dependent, younger generations (Focas & Christidis, 2017).

The mobility of the future could be a combination of diverse travel behaviours, which will be different depending on social groups and location (primarily urban/rural) with different paces and needs, and a different level of contribution in pollution depending on their relative size and growth (Pucci, 2015; Stokes, 2013). Understanding these differences will be crucial to build targeted policies for behaviour change. As Anable (2005) argues, people must be treated in different ways because they are motivated by different factors and are affected in different ways by policy, which will be more successful if addressed to specific demographic groups or land use types than "one size fits all" approaches (Focas & Christidis, 2017). Indeed, the aim of this research is to focus on two social groups in particular: "Baby Boomers" (BB) and "Millennials" (MM).

2.2   Baby Boomers (BB)

Baby Boomers (those born between 1946 and 1964) are the result of the high fertility rates between the mid-1950s and the mid-1960s (Sobotka, 2004)(Figure 2.1), and increased social and economic prosperity experienced in many countries in the global north in the post-World-War II era. The existing literature predominantly deals with the USA area (Bavel & Reher, 2012). In fact, as highlighted by Bagnasco, Barbagli & Cavalli (2012) , they were particularly the countries of UK, USA, Canada and Australia that after the II World War experienced the highest increase in the number of births, a phenomenon commonly known as "baby boom". This phenomena regarded Europe as well (as shown in Figure 2.1), even if

to a lesser extent. Bringing the example of Italy, it can be clearly noted how the fertility rate increased from around 2.3 children per woman of the early 50's to the maximum post-war value reached in 1964 (2.7 children per woman) (Table 2.2).

The number of studies explicitly addressing the causes of the baby boom is very limited. Most explanations emphasize the importance of the return home of soldiers participating WWII, a period of economic growth that affected many countries after the war, and in which relatively small cohorts had ample economic and social expectations before them, and with a sense of general optimism reinforced by cultural contexts in which large families were held up as a socially desirable goal for all (Bavel & Reher, 2012).
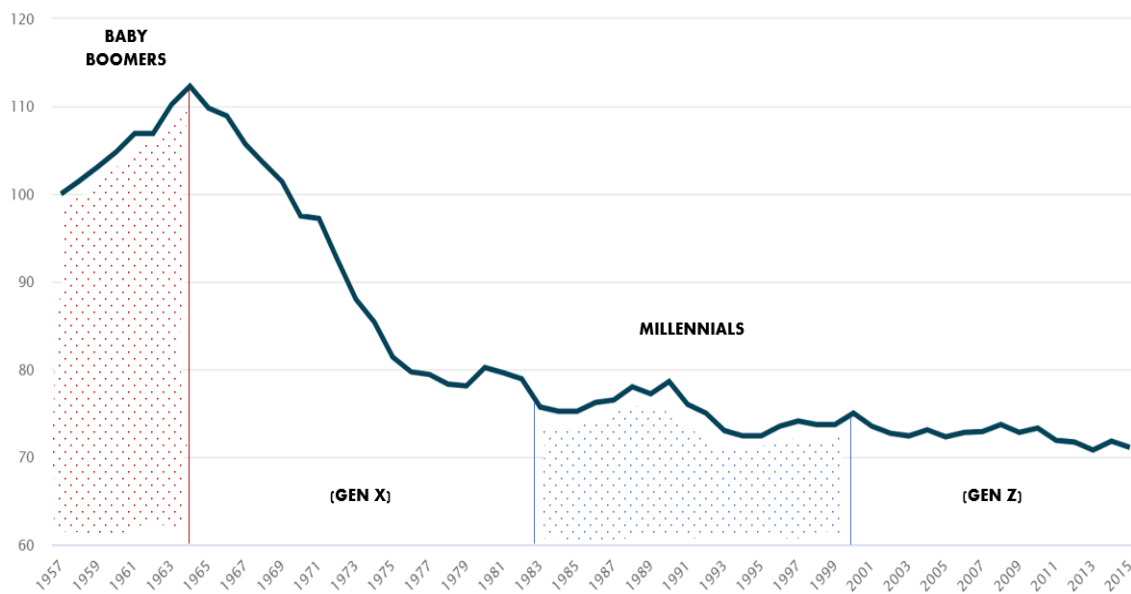

Figure 2.1. Index number of births in EU28 by year. Source: Istat processing on Eurostat and United Nations data (UN Population Division). Index numbers are calculated with the base of 1957=100. The aggregate E6 until 1993 includes only metropolitan France; Germany includes also ex-GDR oriental Lander. The aggregate Eu28 is based, until 1960, on United Nations evaluations. Graphic elaboration on cohorts of my own.

Table 2.2. Fertility rates in Italy, years 1952-2011. Source: Istat, "Tavole di fecondità regionale" (ISTAT, 2014).

Year	Total fertility rate
1952	2.3
1955	2.3
1960	2.4

1965	2.7
1970	2.4
1975	2.2
1980	1.7
1985	1.4
1990	1.4
1995	1.2
2000	1.3
2005	1.3
2010	1.4
2011	1.4

They also represent the current protagonist of the "ageing society" in Europe, a process attributable to consistently low birth rates ("ageing from the bottom") and higher life expectancy ("ageing from the top") which are transforming the shape of the EU-28's age pyramid (Figure 2.2). The impact of population ageing is particularly relevant: new cohorts of older people tend to be more mobile than the past, with higher driving license rates and car use (Hjorthol et al., 2010; Mattioli & Anable, 2017; S. Rosenbloom, 2001); they are healthier and more mobile than their parents at their age, and with higher car reliance (Figueroa et al., 2014; Siren & Haustein, 2013).
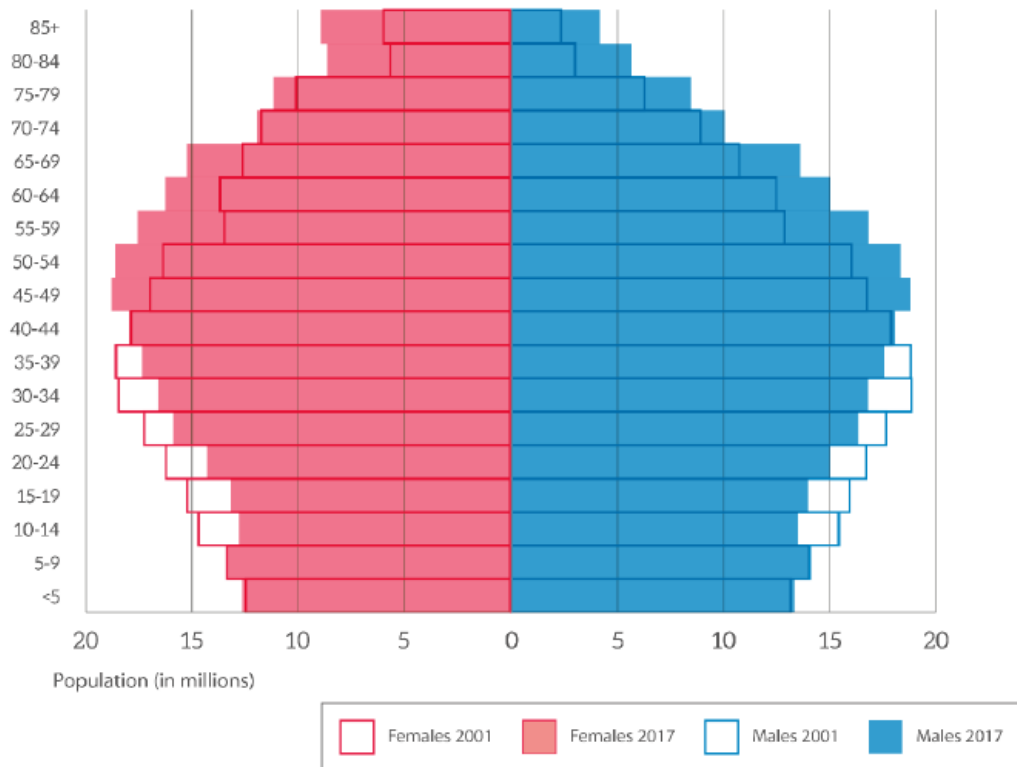
Figure 2.2. EU28 Population Pyramid - cfr. 2017 and 2001. European Parliamentary Research Service (EPRS) based on Eurostat data.

In fact, Baby Boomers were the spearhead of a rapid, prolonged and persistent growth in driver licence holding, car ownership and car use (Chatterjee et al., 2018; Thomas, Geurs, Koolwaaij, & Bijlsma, 2018). They are characterised by high car dependence, being grown in an auto-mobile system, having lived their childhood during the increasing importance of car as a means of transport (Carlson, 2011), in the century that is often referred as the century of the car (Gilroy, 2001), living it as a symbol of freedom, independence and social status (Steg, 2005; Stokes & Hallett, 1992). Studies found that these cohorts maintain their car use habits at old age (Hakamies-Blomqvist, Henriksson, Anund, & Sörensen, 2005; Hjorthol & Sagberg, 2000; Siren & Haustein, 2013) and that they travel more than the comparable age groups 20-25 years ago (Coughlin, 2009; Rosenbloom, 2001; Siren & Haustein, 2013). Their car-related travel behaviour is also characterised by little willingness to change - as seen for example in the research of Figueroa, Siren & others (2014), which found that the car use of older adults is not substituted by other modes in high-density settings, as it happens on contrary for younger adults.

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A large proportion of this cohort have driving licences, and use the car to a great extent for everyday transport (Hjorthol et al., 2010; Siren & Haustein, 2013). In a demographic perspective, they were characterised by becoming more mobile in each successive cohort, with higher everyday trip rates (especially car trips), and more activities outside home, especially in the social/leisure category (Arentze, Timmermans, Jorritsma, Olde Kalter, & Schoemakers, 2008; Figueroa et al., 2014; Hjorthol et al., 2010; Miranda-Moreno & Lee-Gosselin, 2008; Rosenbloom, 2001; van den Berg, Arentze, & Timmermans, 2011).

Why do they move more than their predecessors at their age? This is partly explained by the fact that many more have driving licences and are car owners, especially among older women (Berg, Levin, Abramsson, & Hagberg, 2015), also as confirmed by the increase in licensing rates and car access among the older population during recent decades (Hjorthol et al., 2010; Rees & Lyth, 2004). Furthermore, they generally have more leisure time and fewer social and family obligations as compared to their predecessors and their younger counterpart; especially considering empeding retirement (Higgs & Quirk, 2007). This is mostly due to the fact that they have benefited from the development of welfare system, healthcare innovations, economic growth, gain of formal education, and have a large critical mass in society, consequently more political and societal power other than more economic resources; they were the first generation to be born into and live their whole lives in a society with modern mobility, characterised by automobility and long-distance leisure travel and different consumption patterns (Siren & Haustein, 2013).

Commuting and work-related trips decline after retirement, but the car remains important for trips related to shopping, leisure, health, visit relatives and other social company (Berg et al., 2015; Curch & Thomas, 2006; Schmöcker, Quddus, Noland, & Bell, 2008). Hjorthol, Levin, & Sirén (2010) assert that a decrease in such trips is observed only for those aged 75 years and older. Moreover, the distances involved increase as social networks are spread over longer geographical distances than before, with a growing amount of trips linked to the visit of relatives and friends living far from home (Axhausen, 2005; McPherson, Smith-Lovin, & Brashears, 2006; Schlich, SchÖNfelder, Axhausen, & Hanson, 2004; van den Berg, Arentze, & Timmermans, 2013). Furthermore, the research of Figueroa et al. (2014) found that older people are likely to make more car trips for social activities than average, as the travel demand for social purposes is growing with the growing of leisure time. This indicates that, with regard to social activities of the Baby Boom generation, increasing age is associated with increasing rather than decreasing mobility.

2.2.1 Why is it important to focus on them?

It is evident that the travel demand of this population have and will have a substantial impact on the entire transport system. The generations that are retiring now and in the future will most likely keep their license into old age, with their improved health conditions, active lifestyles, increased access to a car, and for some groups, higher income create possibilities and needs for more varied activities if compared to previous generations of pensioners (Berg et al., 2015; Hjorthol, Levin, & Sirén, 2010). They are at an age when most people do not experience health decline, and they are in a stage of life with increased free time at their own disposal (Berg et al., 2015). It is observed that the continuous increase in car availability for seniors, especially in Europe, may dampen the peak car (cfr. par. 1.3) (Kuhnimhof et al., 2013). Thus, understanding their travel needs and patterns will be a fundamental challenge for transport planning for several reasons: i) to reduce car use in favour of slow modes of transport; ii) to offer mobility options different from private car but suitable with the elderlys' (and environmental) needs, iii) to investigate the future implications for mobility when their ability to drive deteriorates, also considering that, as several studies point out (*ivi*), car dependency among a growing older population will contribute to increased risks to vulnerable road users, decreased physical activity other than increased CO_2 emissions (Pillemer, Wells, Wagenet, Meador, & Parise, 2011). Furthermore, Siren & Haustein (2013) point out that in general, the Baby Boomers reported being optimistic regarding their level of mobility, capability to use a variety of travel modes and ability to lead an independent life in the future, but that overly optimistic scenarios in which their need of support will be minimal are unrealistic.

If it's true that future mobility demand and traffic levels in the long term will mostly depend on younger generations, which are now crucial to understand and monitor, it is also true that when we talk about Millennials, we should also talk about the Baby Boomers: they're the ones who raised Millennials and they're the ones who created the world in which Millennials grew up (Corvi, Bigi, & Ng, 2007). And there is wide literature dealing with how the mobility choices of parents influence the travel patterns and perceptions of their children, and how intergenerational influences works also the other way around (Chatterjee & Scheiner, 2015; Susilo & Liu, 2016). It is also interesting to raise the topic of the role of older women, especially considering their future development: the role of women in society has significantly been redefined during the last thirty years; as a consequence, older women are the fastest growing segment among drivers with more varied out-of-home activity patterns (Coughlin, 2009). The gender roles and gendered activities

have changed tremendously during the Boomers' lifetime, and the Boomer womens' activities and resources are likely to be different from their mothers. It is in general expected that the gender differences in travel patterns in old age will decrease or even disappear (Siren & Haustein, 2013). Last but not the least, older persons can constitute an important source of solutions to environmental problems: on a societal level, due to their increasing numbers with the aging of the baby boom, the impact of the older population's collective behaviors – for example environmental volunteering - could be enormous (Pillemer et al., 2011).

2.3   Millennials (MM)

The other generation protagonist of this research is the one of the "Millennials", namely the ones that became adults around the turn of the millennium, and which is largely made up of the children of the Baby Boom generation. It is in fact common to refer to them as the "Echo Boomers" as well, to emphasize their strong relation with the Boomer generation (Bagnasco et al., 2012). For this cohort it is less easy to find a strong consensus in literature about the range of dates which defines them, as it is for the Baby Boomers (which were defined by a strong demographic criteria, as seen above): it generally goes from the early 1980s as a starting point, to the mid 1990s or early 2000s. For the analysis in this study, Millennials has been defined as the ones born between 1983-2000, which is the most common range applied - as indicated by Dutzik et al. (2014).

Much research on the youngest generations of drivers has been conducted in the United States since the 1990s, without a comparable literature in Europe (Corvi et al., 2007). These studies show that among Millennials, car ownership and use, as well as licence ownership, have reduced or stagnated in the last few years in a number of developed nations (Blumenberg et al., 2012; Delbosc & Currie, 2014; Dutzik & Baxandall, 2013; Dutzik, Inglis, & Baxandall, 2014; Kuhnimhof et al., 2012; Kuhnimhof, Zumkeller, & Chlond, 2013; Mcdonald, 2017) when compared with previous generations (Garikapati et al., 2016; Lyons, 2014; Polzin, Chu, & Godfrey, 2014), revealing a crucial role of younger generations in car peak.

When speaking about licensing, one view is that the reduced tendency to obtain a driving licence is merely a delay which will be made up for later on, especially due to economic recession, which have been proposed as major factor in reduced youth licensing (Davis, Dutzik, & Baxandall, 2012; Gilroy, 2001). The global financial crisis of 2008 and the resulting increase in unemployment rates had a disproportionate impact on young people

(Davis et al., 2012). Nevertheless, it is not clear whether short-term financial shocks are a significant influence on licensing. In Sweden, for example, licensing rates began to fall before a recession in the 1990s and continued to fall afterwards (Berg, 2001); and it seems probable that the numbers of people holding a driving licence will remain lower (Frändberg & Vilhelmson 2011; Nordbakke et al. 2016). Also licensing itself became more expensive and rigid in many countries, with increasing of the minimum age for a permit, stricter theory and practical testing, minimum supervised driving hours, maximum speed or engine size restrictions, blood alcohol restrictions and mobile phone restrictions (Preusser & Tison, 2007; Senserrick, 2009).

When speaking about car ownership and use, since the early 1990s, the general trend has been for each cohort of young to own and use cars less than the preceding cohort, and also to lower the rate of growth in car use with age. For example, existing evidence in the United Kingdom (Stokes, 2013) and London (Transport for London, 2014) shows that the lower level of driving continues with age for the younger cohorts; and there is also a growing number of young people who say they don't ever want a car (Focas & Christidis, 2017): this suggests that their changing behaviour might be more than just a postponement of driving.

Using the words of Eric Jaffe in his article on Bloomberg (2015), «*it's clear to all that young people are driving less today than they did in the past. But the reasons for these shifts in car use are what remain locked in seemingly endless debate*»[11]. Earlier studies seeking to explain the differences in travel behaviour between younger generations and previous cohorts, have shown that these are partly explained by changes in life circumstances and living/socio-economic situation, which represents structural and long-term changes that predate the 2008 global economic crisis and subsequent recession (Report & Unit, 2018). These include increased urbanisation, increased singlehood, the upcoming of e-communication, higher car mobility costs, increased economic insecurity and changing life styles & attitudes (Axhausen, 2013; Chatterjee et al., 2018; Delbosc & Currie, 2013; Goodwin & van Dender, 2013; Kuhnimhof, Buehler, & Dargay, 2011; OECD, 2009; Thomas et al., 2018)(summarised in Table 2.3).

In general, if compared with previous generations, the period of "youth" of Millennials has been extended (Bagnasco et al., 2012; Van de Velde, 2008): rates of educational participation have expanded, determining a general increase in the age at which

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[11]   Available   at: https://www.bloomberg.com/news/articles/2015-07-13/why-millennials-are-driving-less-than-previous-generations-did-at-the-same-age

people typically leave parents' house, start working, having relationships and children, which are generally recognised as the steps to "adult life" – especially in some countries where it persists a precise "sequence" of these steps which is generally recognised as the "right one" (ISTAT, 2014). Furthermore, the rapid changes in fertility or marriage rates are connected to an entire system of socio-economic and cultural factors which determines the variation of individual preferences, limitations and opportunities. For instance, their job conditions are characterised by lower full-time employment rates (Delbosc & Currie, 2013; Noble, 2005), increase in low-wage, uncontracted jobs; stagnation in wage rates; large increase in time spent at home; decline in disposable income - that have not been experienced by older adults (Chatterjee et al., 2018) – all of which are likely to reduce the financial ability to purchase and run a car in the short term. This has consequently led to delayed milestones such as marriage and/or parenthood, which in turn means different mobility needs (McLaren, 2016; Mui, 2015). Young people have been living at home for longer in Australia, North America and Europe (Australian Bureau of Statistics, 2009; Cobb-Clark & Deborah A, n.d.; Mitchell, 2006; Settersten & Ray, 2010), which means to have access to parental resources such as low housing costs and shared household vehicles.

According to the well-known review on licensing decline conducted by Delbosc & Currie (2013), young people living in inner and accessible areas are less likely to have a driving license compared to those living in suburban or rural areas (Licaj, Haddak, Pochet, & Chiron, 2012; McDonald & Trowbridge, 2009; Noble, 2005; Raimond & Milthorpe, 2010). In fact, many scholars have attributed the "car peak" to a reversal of residential land use patterns from suburbanization to a predominance of urban density and accessibility to central services, with Millennials redefining the urban landscape as they tend to live in dense urban environments that are less car-dependent , being open to the use of non-driving modes of transport and in general a greater attraction to less driving-intensive lifestyles (Figueroa et al., 2014; Headicar, 2013; Newman & Kenworthy, 2006). Going deeper in the long-lasting debate on "where do Millennials live", it is important to highlight that the rich literature produced these very last years is coming almost exclusively from USA (Deka, 2018; H. Lee, 2020; Y. Lee, Lee, & Shubho, 2019; Moos & Revington, 2018; Raymond, Dill, & Lee, 2018). Walker (2015) says that north-american Millennials are creating a new trend: thanks to the generation's size and influence, they are moving to new places made just for them and by them, revitalizing smaller cities and being a driving force in the urban resurgence ("youthification", as labelled by Markus Moos - Moos et al., 2015) or opting for hybridised urban-suburb enclaves where quality of life is the driving force, prioritizing dense and walkable neighbourhood, with transit proximity, bike-commuting amenities, and other

perks which aligned with these lifestyles. In fact, Millennials were more likely to net migrate into central locations and less aversive to high density at their young ages than late Boomers were in the 1980s, and purchase houses near city centres 21% more than Generation X, moving less to the suburbs as recently found respectively by Lee (2019) and Raymond et al. (2018). But Walker, as well as other researchers, also notes that it may turn out that many Millennials were not planning on settling in cities for good; they were just postponing the move to the suburbs for a few more years. As reported by Sarah House, economist at an American multinational financial services company: "*Especially in the older Millennials, we're seeing a move towards more traditional patterns, just on a delayed time frame*"[12]. So as mentioned by Logan (2014), as the economy improves and Millennials move through various phases of their lives, their housing preferences may mirror those of previous generations;, and the demand for new single-family homes is likely to increase as they enter their 30s.

Despite several efforts in literature review, similar studies in Europe have not (yet?) been implemented and it is very difficult to fill this gap in understanding european Millennials' residential preferences and paths. A recent case study is represented by the research of De Vos & Alemi in Ghent (Belgium) (2020) which found out that the majority of young adults live in urban areas but a large part actually likes to drive. This may suggest that they might prefer suburban neighbourhoods but they are often forced to live in urban ones, since the rising costs of driving make them more affordable if compared to suburban lifestyles (although city centres are rarely inexpensive place to live in, they has to be considered the lower travel costs and smaller housing units). Another study focused on cycling patterns in the Netherlands found that in more urban areas the proportion of teenagers and young adults has been growing, especially in recent years, whereas the proportion of elderly people is growing in less urban areas (Harms, Bertolini, & te Brömmelstroet, 2014).

Although, it is important to note that in the UK, France and the Netherlands, Millennials' licensing and car travel have also decreased in small-town and rural areas (Grimal, Collet, & Madre, 2013; Noble, 2005; van der Waard et al., 2013). The direction of causality is unclear: young adults who are attracted to inner-city living may choose not to get a license, or young adults who do not want a license end up living in inner-city areas; it is reasonable to assume that causality works both ways.

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[12] From the magazine article on Reuters written by David Randall, 6th May 2015: "As millennials reach parenthood, fund managers bet on 'burbs" – available at http://reut.rs/1EWvQmN

Also, it is important to consider the general increases in the cost of owning and using a car, which include insurance, license, fuel and purchase costs, combined with the general rise in car restrictions policies and the promotion of more sustainable ways of moving, with improvements in the quality and reliability of transport modes alternative to the car (including public transport) and land-use planning (Noble, 2005).

The growing relevance of e-communications & ICTs might have also played a role: Millennials were the first to embrace new technologies and use them in their everyday life. This has been often simplified explaining that online social networks now allow people to stay in touch and connect without moving; being born and brought up in an era of ubiquitous technology and connectivity might allow the substitution of driving and out-of-home activity participation with in-home virtual activities, with ICTs providing alternatives for physical presence (Garikapati et al., 2016; Mokhtarian, 2009). But much researches casts doubts on these conclusions: some studies suggest that e-communication supplements face-to-face contact but cannot replace it, while sometimes they support each other (Delbosc & Currie, 2012; Hjorthol, 2016; van den Berg, Arentze, & Timmermans, 2009). Moreover, e-communication facilitates a lifestyle based around public transport travel better than car travel, since it allows them to travel while using their mobile devices - working, communicating, using social media - making more productive use of time (Davis et al., 2012; Hong & McArthur, 2019; Lyons & Urry, 2005). Eg. WiFi had a positive and significant impact on train ridership, especially effective at attracting new riders (Dong, Mokhtarian, Circella, & Allison, 2014). In particular, these new opportunities have had implications for the way people think about the value of travel time. As Lyon and Urry say in their "Travel time use in the information age" (2005), such undermining of the division between activities and travelling, and between activity time and travel time, may have major implications for future levels of mobility. ICTs also contribute to a rise in multimodal travel behaviour – with applications and platforms facilitating the organization of trips – and the availability of car sharing clubs and peer-to-peer sharing models in cities (Kuhnimhof et al., 2012). Plus, if the car is losing its place as a major interest and status symbol, it is possible that its position is being displaced by technology and e-communications, re-prioritising the spending away from cars and towards other necessities and interests, following the idea of Kaufmann (2017) that the "age of the internet" replaced the "age of the car", shaping different aspirations.

In fact, in addition to demographic and structural changes, attitudes may play a role in reducing the attractiveness of the car. Some researchers have suggested that more environmental attitudes may be discouraging young adults from driving cars, due to social

norms shifting within the Millennial generation to more "green" values (Figueroa et al., 2014; OECD, 2009); however, other research casts doubt on whether young people are more environmentally aware than previous generations and questions whether these attitudes have an actual impact on behaviour, suggesting that are unlikely to be a major contributor to these trends (DEFRA, 2002; Delbosc & Currie, 2012).

Table 2.3. Factors connected with the decrease in car use and ownership in the Millennial cohort.

Delayed adulthood	Extended time spent in education; living with the parents longer; increase in the age in which they start to work and build families
Job conditions	Lower full-time employment rates;increase in low-wage, uncontracted jobs; stagnation in wage rates; large increase in time spent at home; decline in disposable income
Residential preferences	Preference for urban density, walkable communities and accessibility to central services & less car-dependent lifestyles
Rising costs of motorization and car-restrictions policies	Increases in the cost of owning and using a car (insurance, license, fuel and purchase costs) + rise in car restrictions policies / promotion of more sustainable ways of moving
E-Communications & ICTs	Substitution of driving and out-of-home activity participation with in-home virtual activities; possibility of a more productive use of time while travelling on public transport using ICTs; trip-planning apps facilitating the use of PT/car sharing/car pooling etc.; "age of the internet" replacing the "age of the car"
Environmental attitudes	Rise in "green values" and environmental awareness

Also, following what stated by Ortar & Vincent-Geslin (2017), there is a slight difference within the Millennial generation itself: "early" Millennials (1983-1991) have been raised and socialised in a dominating car culture (Sheller, 2004), educated in a world where the place of the car was still dominant and unquestioned, and where obtaining the driving licence were (and sometimes still is) a prerequisite for becoming an adult (Masclet, 2002; Tilleczek, 2011), naturalizing mobility attitudes (Rajan, 2006). While their younger counterpart (let's say the "late" Millennials, 1992-2000), the new generations who are now too of an age to take financial responsibility for their spending, have a more pragmatic relationship with transport, viewing it as a tool serving more global ways of living (Hjorthol, 2016).

It is also interesting to note that Millennials were the first generation raised by women who entered professions in big numbers, which might have affected their perception of autonomy and mobility needs (Miller & Yar, 2019). There is evidence that being exposed to transit at a young age can influence travel behaviour even much later in life (Smart & Klein, 2018), and considering how the Millennial generation has been/is being more exposed to the use of mass transit if compared to previous generations, it is likely to expect that they will shape their future habits in a less car-dependent way. In contrast, the Millennials which have lived their whole lives in a transport system that relies almost entirely on the car, it is no surprise if they use the car as soon as economic circumstances allow (Delbosc et al., 2019).

2.3.1 Why is it important to focus on them?

The Millennial generation, other than its proven role in the "car peak" (cfr. par.1.3.2) is gaining attention for their increasing presence and influence in the marketplace and workplace (Garikapati et al., 2016). Their impact on politics, economics, social and cultural constructs, are similar in magnitude to that of the Boomer generation (which in the next decades will lose their long-lasting predominance as voters and political influence), but magnified exponentially by the power of the Internet and its related technologies and applications (Corvi et al., 2007). They have been protagonist of a trend on car use/ownership that started with older members of the Generation X (next to the Baby Boomer generation, born around 1965-1980) and built up with the Generation Millennial cohort (also referred to as "Generation Y") and that will possibly continue with the Generation Z (post-Millennial birth cohort, born around the end of the 1990s and the first decade of 2000a) (Chatterjee et al., 2018).

As already said in the previous chapter, it is unquestionable that car use and owning have stopped growing and experienced a decline in most economically developed nations. As pointed out by Focas & Christidis (2017), the debate is now on (i) how permanent this reversal of past trends is, (ii) how far is it related to purely economic factors, and (iii) what may be other underlying causes. The main question, for researchers, transportation planning professionals and policy makers, is what is going to happen to Millennials as they grow older: how travel demand will evolve in the future, and the consequent implications for transport infrastructure investment and policy formulation. According to the United Kingdom's Department for Transport (2015), if they continue to delay major life events, staying in cities longer, and only driving more when they get older

and move to rural areas – they may not increase their car use until later in life. Furthermore, there is the possibility that this cohort's attitude to the car has fundamentally changed and habits become ingrained so that their car use remains at lower levels – but as the report mentions, there is little evidence at present to suggest that this is the case.

As well exposed by Delbosc & Ralph (2017), at the end of the day there are two main narratives on the big question around the persistence of Millennials' mobility behaviours:

- One is the optimistic narrative of Millennials as sustainable travellers, who drive less, use public transport more, flock to the cities and embrace technology rather than cars. This is the narrative often taken up in "grey literature" reports (materials and research produced by organizations outside of the traditional commercial or academic publishing and distribution channels) and popular media.

- The other is a more sombre view in which Millennials are driving less primarily because of reduced incomes and a delay in "adult" milestones, suggesting that many of them will likely drive more if and when their circumstances improve. This narrative is less often explored in "grey literature" reports or popular media.

Trying to add knowledge to the complex understanding of what of the two narratives is more close to the current reality and possible futures, is the "fil rouge" of this PhD research project.

3 Methodology

3.1 Framework

This study can be inserted in the framework of the Sustainable Transition Studies, integrated and guided by the principles and theories exposed by John Urry in the New Mobilities paradigms (cfr. par.1.2.2). The approach adopted in this research is to study mobility behaviours on a cohort basis. As anticipated in the previous chapter, this means to study travel habits and attitudes of a group of people which share the fact to have been born and lived in the same interval of time, and compare them to another cohort. This implies different micro and macro factors related to car dependence (for instance, the Millennial generation having different attitudes and social/economic/cultural contexts in which they grew up) to be combined with the influence of the geographical context (European-wide regions and/or local contexts), in order to keep a spatial perspective, as advised by STS.

Considering the literature exposed in the first two chapters, the key question is to understand if the new generations are facing long-lasting trends of decrease in car ownership and use, which will bring to a proper transition in mobility habits, or if it's mostly related to temporary circumstances. A change towards more sustainable modes of transport *by choice* has different societal consequences than reductions made due to economic or social restrictions (Heinen & Mattioli, 2017). Car ownership is postponed now, but will it catch up later? Or will car ownership and use decrease gradually as the new generations substitute their car-dependent predecessors (fulfilling the "Peak Car Hypothesis" – cfr. par.1.3.2)?

Table 3.1. Research framework

Research evidences	- Technological innovation is not sufficient to achieve significant emission reductions. It emerges the need to act on travel behaviours & people attitudes to mitigate transport impact on climate change - Massive behaviour change is strongly related with socio-demographic trends - "Gross polluters" are mostly represented by BB, characterised by a high car dependence, grown in an auto-mobile system, with frequent & intense use of vehicular transport and low attitude to change - "Smart travellers" are mostly represented by MM, characterised by lower car dependence, decreasing car ownership & use, and a tendency to be more attracted by new forms of sustainable mobility/lifestyles

Objective	To add knowledge on the understanding of *if* and *how* the Millennial generation is contributing to a transition towards more sustainable travel behaviours, verifying the trends described in literature and understanding if the apparent *more sustainable habits* of Millennials are part of a "generational change" that will persist over time and be determinant for a sustainable mobility transition in Europe (Peak Car Hypothesis), or if there are more circumstantial and temporary reasons around these changes.

Research question	Implementation
Are Millennials more sustainable in terms of mobility habits and attitudes?	Verify the trends described in literature doing a comparison with the BB cohort on a European basis.
Is this part of a generational change that will persist over time?	Analyse the recent changes in life circumstances of the two cohorts and the role of the geographical context; Verify the presence of a cohort effect in the attachment to car and its weight / the one of other key individual and territorial variables; Investigate the imaginary[13] of Millennials on the main modes of transport, their form of car dependence and the dynamics behind modal choice & behaviour change.

The expected outcome is to provide the elements to understand the trends regarding Millennials (travel habits, life choices, attitudes) and the future implications for the environment, obtaining as a result more evidences on how to shape more targeted urban policies and well-informed planning for a transition towards a more sustainable transport system.

The original contribution of this study can be detected in the effort to analyse the potential towards a mobility transition through the eyes of two crucial cohorts of people, observing how and if generational changes can help us to better define the future steps of people's mobility in terms of environmental impact in the European context. Existing literature in these terms comes mostly from the USA and/or tends to analyse cohorts separately (see for example Clewlow et al., 2018). So this study aims to fill the gap in European literature, using data which cover the EU28 area (see following paragraph) and analysing the two cohorts in parallel. The choice to compare these two cohorts in particular comes from the fact that, as shown in literature, they represent two generations strongly characterised by having experienced disrupting changes in the mobility system if compared

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[13] Here defined as the system of values, representations, and symbols.

with the previous ones, and that currently represent a large part of the population, which will determine travel demand and traffic in the next few years.

Secondly, the peculiarity of the study is to utilise a mixed approach, with a first phase of quantitative analysis to get general trends in demography and behaviours in Europe ("from above") – with the use of statistical tools to get the relations among modal choice and other factors (exposed in the next paragraph 3.2) – and a second phase based on a qualitative approach to deepen the dynamics underlying these trends, from an internal perspective (exposed in paragraph 3.3).

Finally, the research sits well within a wider concern to i) open up research on travel behaviour, to overcome the tendency to focus on cross-sectional studies with the idea that the determinants of travel behaviour are constant; ii) recognize the key question that if there is a difference in Millennials' travel behaviour, then it is important to assess whether that difference will disappear over time, or whether it is something that will persist (to some extent) over time.

3.2   Quantitative analysis

3.2.1   Datasets

To answer part of the questions above, a quantitative secondary analysis with SPSS software has been implemented. Since it was not possible to find a unique European-wide database with all the information necessary for my research questions, the analysis has been made gathering more than one source of data, represented by large European datasets (EU28 area): 1) "Travel Survey on demand for innovative transport systems" conducted by the Joint Research Centre Seville (JRC) in 2014 and 2018 (Christidis, 2016); 2) Eurobarometer (waves 79.4 of 2013 and 88.1 of 2017) (European Commission, 2017, 2018b); 3) EU-SILC (European Union Statistics on Income and Living Conditions) User DataBase (UDB) from 2008 to 2018 (Table 3.2).

The main source of analysis has been the JRC travel survey of 2014, which currently represents the most detailed, updated and rich dataset available of European trends on mobility habits and attitudes of citizens, with a second edition of 2018 that allowed comparisons. Then, to complement some lack of information and integrate the analysis with more deep and accurate prospects of the population characteristics (such as residential choice or socio-economic situation), the Eurobarometer and EU-SILC datasets has been

chosen respectively for their scrupulousness and high reliability in the sampling process[14] and for the possibility to get more reliable trends with time series. Datasets has been analysed separately on the basis of the variables of interest available in each one, then gathering and interpreting the results for each topic (life conditions and context, mobility behaviour). A fundamental requirement fulfilled by each of these dataset – but not so obvious – was to have the year of birth of each respondent, clearly necessary to implement cohort analysis, and their large-scale nature, which was another important prerequisite to provide robust and comprehensive evidence of the differences among the two cohorts analysed.

Table 3.2. Summary of datasets used.

	Travel Survey on demand for innovative transport systems	Eurobarometer waves 79.4 + 88.1	EU-SILC
Responsible of data	Joint Research Centre	European Commission	Eurostat
Year(s)	2014 and 2018	2013 and 2017	2008-2018 (time series)
Sampling method	Quota sampling	Proportionate Stratified Multistage Sample	Stratified Multistage Sampling (most used)[15]
Sample area	EU28	EU28	EU28
Units interviewed	26.605 (2014) 26.500 (2018)	26.627 (2013) 27.881 (2017)	269.803 (average each year) 2.967.830 (full dataset)
Mode of collection	CAWI (Computer Aided Web Interview)	Face-to-face interview + CAPI (Computer Assisted Personal Interview)	EU registers + interviews (CATI, CAWI, PAPI – Paper Assisted Personal Interview)
Purpose in this research	Investigate travel habits and attitudes of MM and BB, also controlling the effect of socio-territorial characteristics on car	Investigate details on marital status and children, occupation, economic difficulties and life expectations	Observing trends with time series on income, job conditions, household composition, education, economic and physical

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	choice with regression analysis, and spatial representation on maps.		situation, degree of urbanisation, presence of a car in the household

Travel Survey on demand for innovative transport systems (2014 and 2018)

As the European Commission's science and knowledge service, the Joint Research Centre (JRC) supports EU policies with independent scientific evidence throughout the whole policy cycle. JRC in Seville works closely with sister services of the European Commission to provide socio-economic and techno-economic support for the conception, development, implementation and monitoring of EU policies. The main purpose of the survey in 2014 was to collect data on car use, on use of transport modes for long distance mobility as well as on some other policy relevant issues. It involved all the EU28 countries with a sample of 1000 individuals each (500 in Cyprus, Luxembourg and Malta), segmented according to socio-economic characteristics – reflecting the composition of adult population (from 16 years on) in terms of gender, age class, employment status, education level and living region – and CAWI (Computer Aided Web Interview) methodology (same questionnaire (translated in the local language)[16]. The survey provides a rich and comparable picture of mobility across the 28 EU countries, and was repeated in 2018 (data are not publicly available yet[17]). This has been the reference dataset for the main analysis, with the largest re-elaboration of variables to build the basis for statistical analysis (e.g. cleaning, recoding, harmonisation of 2014 and 2018 datasets. Details in Annex A).

Eurobarometer (2013 and 2017)

The Eurobarometer series is a unique cross-national and cross-temporal survey program conducted on behalf of the European Commission since 1973. These surveys regularly monitor public opinion in the European Union (EU) member countries and consist of standard modules (which address attitudes towards European unification, institutions and policies, measurements for general socio-political orientations, as well as respondent and household demographics) and special topic modules (e.g. on agriculture, education, natural environment, public health, public safety and crime, science and technology). Each survey consists of approximately 1000 face-to-face interviews per country, and reports are published twice yearly. Special Eurobarometer reports are based on in-depth thematic

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[16] Data available here: https://data.europa.eu/euodp/it/data/dataset/jrc-tem-eu_travel_survey_2014_new_technologies

[17] Access to 2018 data provided during my visiting at the JRC-Sevilla.

studies carried out for various services of the European Commission or other EU Institutions and integrated in the Standard Eurobarometer's polling waves. Eurobarometer datasets were obtained through the GESIS Leibniz Institute for the Social Sciences, a European data archive and research infrastructure provider, of which I had access during my visiting period at the JRC-Seville (details of variables used: Annex B). The waves requested were:

- *Eurobarometer 79.4 (2013): "Social Climate, Development Aid, Cyber Security, Public Transport, Anti-Microbial Resistance and Space Technology"*[18]. Queries of public transport/ urban mobility special topic asks about use of car, public transportation, cycling and walking, frequency of travel within cities, problems during travel, opinions on problems in the city, ways to improve city travel, measures to improve travel and responsibility for reducing traffic; other than the main sociodemographic characteristics of the respondents.
- *Eurobarometer 88.1 (2017): "Parlemeter 2017, Cultural Heritage, Future of Europe, Attitudes of European citizens towards the environment"*[19]. Queries on the attitudes towards environment regarded the most important environmental issues; the personal measures for protecting the environment; the most effective ways to tackle environmental problems, other than the main sociodemographic characteristics of the respondents.

EU-SILC (2008-2018 time series)

The Statistics on Income and Living Conditions – mostly known as EU-SILC – answers the growing demand of data coming from national and European institutions, scientific community and citizens themselves, about life conditions in the different countries of European Union. The minimum number is 5000 families for each country, to adapt on the basis of their demographic weight. The project has the main aim of producing systematic and harmonised European statistics on income, poverty and social exclusion. The whole EU-SILC database includes collections of cross-sectional and longitudinal data from selected

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[18]European Commission. Eurobarometer 79.4: Social Climate, Development Aid, Cyber Security, Public Transport, Anti-Microbial Resistance and Space Technology, May-June 2013. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2015-07-08. https://doi.org/10.3886/ICPSR36038.v1

Details of the dataset: https://www.gesis.org/eurobarometer-data-service/survey-series/standard-special-eb/study-overview/eurobarometer-794-za-5852-may-june-2013

[19] European Commission and European Parliament, Brussels (2018): Eurobarometer 88.1 (2017). TNS opinion, Brussels [producer]. GESIS Data Archive, Cologne. ZA6925 Data file Version 1.0.0, https://doi.org/10.4232/1.12959

Details of the dataset: https://www.gesis.org/index.php?id=11247

EU28 countries, as well as European Free Trade Association (EFTA) countries, from 2004 onwards. In fact, the sample design for EU-SILC survey integrates a cross-sectional component with a longitudinal one (*panel*) every 4 years, respecting the scheme exposed in Table 3.3 (ISTAT, 2008).

Table 3.3. EU-SILC sample design - cross-section and longitudinal components[20].

	2004	**2005**	**2006**	**2007**
1st edition	A B C D			
2nd edition		B C D E		
3rd edition			C D E F	
4th edition				D E F G

For this research, an official request for has been made to Eurostat by Unidata (Bicocca Data Archive[21]) to get EU-SILC UDB (User DataBase) from 2008 to 2018, covering the EU28 population and some selected variables from the Personal register (basic personal data, education, health, labour, income; detailed variables and labels in Annex C) plus car ownership from the Household register.

3.2.2   Methods of analysis

The analysis followed four main steps, analysing the two cohorts using as a territorial basis the whole EU28 area, and observing their changes over time:

1. *Exploratory analysis on life conditions and recent major changes* (2013-2017, Eurobarometer and EU-SILC data): the aspects considered were the household type, residential location, life expectations, plus the income, job, family, education, economic situations. The analyses included the use of frequency analysis, crosstabs,

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[20] Starting from the second edition, ¼ of the initial sample is substituted with a new group (group A with group E). In the fourth edition, a panel of the D group (interviewed through all 4 years) will be available. Source: (ISTAT, 2008).

[21] Internal service of the University of Milan-Bicocca. A special thanks to Carlo Pisano for taking care of the long bureaucratic process, and to Domingo Scisci for the methodological support and for transforming the several folders of yearly EU datasets – divided by country – in a huge unique integrated dataset of EU-SILC data, following my indications by remote in the hard times of quarantine (time coverage 2008-2018, for all EU28 countries, MM and BB population, with selected variables, obtaining as a result 2.967.830 cases suitable for SPSS analysis - EU-SILC UDB 2008-2018 – version of 20/11/2019).

time series of data to analyse trends. In all analyses the EU28 Weight[22] has been applied, which implies the adjustments of each national sample in proportion to its share in the total population of the European Union[23]. These adjustments are based on population figures published by Eurostat in the Regional Statistics Yearbook. The EU28 Weight includes the post-stratification sample weighting factors.

2. *Descriptive analysis about trends in mobility behaviour and attitudes towards car and alternative modes* (2014-2018, JRC data): the analysis was mostly based on what the respondent defined as the "most frequent trip" (looking at preferred mode, time, distance, frequency) and on the attitude towards automobility and alternative modes (car occupancy rates, licensing & vehicle purchasing plans, knowledge and use of car sharing services, attitude towards EVs and multimodality). Similarly to point 1, the analyses included mainly the use of frequency analysis and crosstabs, often based on data re-elaboration and recoding (details and SPSS procedures on how new key variables were created are available in Annex A), comparing 2014 and 2018. All data has been weighted on EU28 Weight.

3. *Spatial representation of the differences among the European territory*, aggregating the analysis on the basis of different clusters of countries (2014-2018, JRC data; details on the characteristics and differences of the territorial clusters will be described in par. 4.3. This step included the use of QGIS software[24] in order to visualize the results of frequencies analysis on thematic maps. In this case, JRC data have been weighted by Country Weight. The categorization of colours for thematic maps was implemented using the Natural Breaks function of QGIS (again, details will be found at par. 4.3)

4. *Multivariate logistic regression model on the probability to choose car as main mode of transport* for the most frequent trip, it has been implemented as a synthesis of the previous methodological, and to verify the presence of a "cohort effect", its role and the one of other key individual and territorial variables (JRC 2018 data).

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[22] As recommended by GESIS, the use of EU WEIGHT for descriptive analysis using Eurobarometer data is mandatory. Source: https://www.gesis.org/en/eurobarometer-data-service/survey-series/standard-special-eb/weighting-overview

[23] According to the Commission Regulation on sampling and tracing rules, weighting factors shall be calculated as required to take into account the units' probability of selection, non-response and, as appropriate, to adjust the sample to external data relating to the distribution of households and persons in the target population, such as by sex, age (five-year age groups), household size and composition and region (NUTS II level), or relating to income data from other national sources where the Member States concerned consider such external data to be sufficiently reliable. Source: Methodological Guidelines And Description Of Eu-Silc Target Variables, European Commission.
(https://ec.europa.eu/eurostat/documents/203647/203704/Guidelines+SILC+2018/).

[24] QGIS (until 2013 known as Quantum GIS) is a free and open-source cross-platform desktop geographic information system (GIS) application that supports viewing, editing, and analysis of geospatial data. Website: https://www.qgis.org

Logistic regression has been chosen as it is a suitable technique for analysing dichotomous outcomes (namely consisting in only 2 opposed values, e.g. 0, 1), which has been increasingly applied in social science research, also because it does not require that data are drawn from a multivariate normal distribution with equal variances and covariances for all variables, being less restrictive than linear regression model (Peng & So, 2002). It assesses the effect of one or more predictor variables on a specific categorical (or qualitative) variable (in this case the probability to choose the car as the main mode), after controlling for effects of all the independent variables. The model has been built on the basis of the key variables detected in the previous phases of analysis, resulting in a mixed model which combines individual and territorial characteristics. The results show statistical association, which cannot be interpreted as unambiguous evidence of causality (Mattioli, 2013). Going in detail: in the simplest case of one predictor X (e.g. gender, education, level of urbanisation...) and one dichotomous outcome variable Y (e.g. choosing the car as the main mode of transport, Yes or Not), the logistic model predicts the logit of Y from X. The logit is the natural algorithm, (ln) of odds of Y, with "odds" meaning the relation between the probability π of an event and the probability that the event is not happening (1- π), namely the formula $\left(\frac{\pi}{1-\pi}\right)$. The simple logistic model has the form:

$$\ln\left(\frac{\pi}{1-\pi}\right) = \log(odds) = logit = \alpha + \beta x.$$

Hence,

$$\pi = Probability(Y = outcome\ of\ interest\ X = x) = \frac{e^{\alpha+\beta x}}{1+e^{\alpha+\beta x}}$$

Where π is the probability of the outcome of interest under variable Y, α is the Y intercept, and β is the slope parameter. X can be categorical (meaning it can express two or more categories e.g. "occupation status": student, employed, retired...) and/or continuous (e.g. trip distance in km), whereas Y is always categorical. The binary logistic regression maps the regression line onto the interval (0, 1), which is compatible with the logical range of probabilities. While holding α as a constant, the logistic curve's steepness in determined by the absolute value of β. If β is held constant, the magnitude of α determines the median location of the curve (Peng & So, 2002). More details on the role of coefficients, interaction between predictors, reliability test of the model and the way of interpretation of the results will be given in par 4.4.

The datasets considered present some limitations. In the first place, the use of the variable "most frequent trip" to analyse travel habits is limitative, because it doesn't provide the whole picture of daily mobility, tending to exclude little trips and/or the ones different from commuting. Traditionally, data in support of travel behaviour research largely come from *travel diaries*, which generally consist on a questionnaire whose answers correspond to the travel diary entities of interest (e.g. trips with their purpose, destination, and main travel mode) (Prelipcean, Susilo, & Gidófalvi, 2018). This method relies on people declaring what they did during the study period (of usually one day) and are more complete in terms of information coverage if compared with the use of "most frequent trip" variable, but rather time and cost consuming. What's more, the field of travel behaviour is entering an exciting period of experimentation and transition, since – with the development of ICTs – radical new sources of data concerning travel habits and powerful new methods for analysing/modelling these data are becoming increasingly available for use by both researchers and practitioners, challenging the traditional tools with new methods and paradigms: use of GPS traces, roadside sensor data, smartphone app data, mobile phone data, smartcard records data (He, Miller, & Scott, 2018; Manyika et al., 2011; Wang, He, & Leung, 2018). Nevertheless, many practical and theoretical challenges exist for these new data collection and modelling methods; for example, the ethical issue of privacy (how to protect privacy but still allow disaggregate analysis?) and the representativeness of data (bigger dataset, but still samples, susceptible to sampling error and response bias)(He et al., 2018).

However, the variable "most frequent trip" was eventually chosen by the JRC researchers as the most effective proxy to get daily habits of European citizens with a travel survey– not being possible to spread a travel diary throughout such a large sample – and the question was formulated in order to get information on the main mode(s) used in the typical daily routine ("*How do you usually make your most frequent trip? Please report all the options used. Select "walk" only if you walked for more than 10 minutes*"). Furthermore, "most frequent trip" is considered because its frequency and repetitiveness for the interviewed people makes it the best-known trip in terms of time and general constraints. The most frequent trip could induce a specific mobility behaviour, regardless of people characteristics (employed/unemployed) and trip purpose (work, shopping, etc.), and it is more related to people habits, less likely to be changed (Pronello & Camusso, 2011). Considering the lack of homogeneous European data on transport habits, it's been considered still worth to use this rich dataset to get general mobility trends on a EU28 basis, and most importantly to relate them to the other valuable information included in

the dataset regarding socio-economic status, attitudes and preferences towards car/other modes.

In the second place, the period of time analysed with JRC data (2014 – 2018) might be too limited to get proper "trends" on mobility habits or speculate on future perspectives. But still, considering it's the first European-wide travel survey (at its second edition), it gives the unique possibility to compare the main changes occurred in recent years with updated territorial data, with the possibility to highlight the most evident trends, and compare/validate them with data in literature, Eurostat data, and qualitative analyses. That was exactly the process made in this research, in which after integrating JRC and Eurostat data to get general trends of the European population – getting information "from above", with a wide perspective in order to have a glance of the effective territorial impact and trends – the observation stepped into the core of the research object, to get more in deep the mechanisms and dynamics behind modal choice, attitude and behaviours of Millennials "from the inside", with the help of qualitative techniques.

3.3 Focus groups

3.3.1 Why focus groups?

If statistics help us seeing the big picture, and in some ways to "measure" the severity of trends and their overall impact, qualitative research allows to investigate in a more complete and deep way the logics and mechanisms behind the practices; what personal experiences and specific territorial dynamics guide the choices and perspectives of the interviewed people.

For this reason, the qualitative research followed the quantitative analysis to investigate in deep the trends emerged among Millennials (factors affecting mode choice and behaviour change); to grasp the different forms of car dependence and comprehend the imaginary of MM on the main modes of transport (namely the system of values, representations and symbols associated with each mode).

For this purpose, it has been chosen the method of focus groups. A focus group represents an artificial situation, context and group of people created by the researcher in order to induce a discussion. While discussing, the participants take a stand, agree or disagree on what is being said, try to convince each other to support their position; they identify themselves, build factions ("us", "you"), speak as individuals or as members of a group, in a process of production of collective meaning (Frisina, 2010). Focus groups also

offer a way to investigate on how opinions, attitudes, discourses, narratives, representations shape themselves and be questioned; it is possible to observe the everyday talk in interaction: the conversation exchanges become a way in which the "world taken for granted" is been reproduced (*ivi*). It is also possible to observe the non-verbal communication (e.g. in front of a certain image, a laugh, a furrowed brow, or an expression of indignation). This happens while the researcher motivates the participants to think about their day to day choices, identifying their needs and observing how they put in place their construction of meaning and imaginary (in this case, around their transport needs and means).

To induce the discussion, the researcher can rely on visual tools to trigger conversations (photographies, images, newspaper articles etc.) and produce identification processes and bring discussion starting from concrete personal emotions and experiences. It is also important to set an informal situation (e.g. sitting around a table with water, fruit juices, snacks) to create a comfortable environment (Figure 3.1).

Figure 3.1. Setting and moments of the focus groups implemented for this research. Own photographies.

The role of the mediator (the researcher itself in this case) is to create an informal and comfortable environment, facilitating the debate, generating participation and variety of opinions, discourses, narrations, representations. To do so, it is fundamental to be neutral (do not impose a vision or values) and to induce the emergence of marginal points of view, keeping the pace of the discussion.

3.3.2 Area, structure & ratio

Area of analysis

The area chosen for the qualitative investigation has been the Italian national territory. According with the EU Climate Action targets, Italy should reduce CO_2 from the current 100 million tons/year to 76.8 million tons/year in 2030, and reach zero emissions in transport in the following 20 years (Donati, 2019). At the end of 2018, the Government presented the National Plan for Energy and Climate[25], that although lacks of ambitious goals in the transport sector and for a substantial growth of renewable-sourced electric mobility, without clear and resolute targets for sustainable mobility of people and goods in 2030 (ivi). The latest report from ISFORT (Istituto Superiore di Formazione e Ricerca per i Trasporti[26]) highlights how in 2018 Italy has reached the highest motorisation rate ever experienced, with 39 million of vehicles on the road (64.6 cars each 100 inhabitants), which in the last decade increased by 8.1%. In 2018 car usage started to rise again after a decline in 2017 (Table 3.4), same for the bike, but in the opposite direction. In addition, the "willingness to use the bike more often" fell from the 38.8% of 2017 to 33.6% of 2018.

Table 3.4. Modal split in Italy 2016-2018. Source ISFORT (2019).

	2016	**2017**	**2018**
Walk	17.1	22.3	22.9
Bicycle	3.3	5.2	4.2
Motorcycle	3.0	3.0	3.1
Car	65.3	58.6	59.1
Public transport	6.6	7.0	7.0
Multimodality	4.6	3.9	3.7
Total	100	100	100

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[25] Details: https://www.mise.gov.it/index.php/it/energia/energia-e-clima-2030

[26] ISFORT - Higher Institute for Education and Research for Transport - was established in 1994 on the initiative of the National Foundation of Communications and the Italian State Railways, which together represent its corporate structure, with the aim of contributing to the renewal of the mobility sector for people and goods. ISFORT aims to encourage the development of the socio-economic and technical-managerial know-how of the sector, through research, consultancy, technical assistance and training. Website https://www.isfort.it/

Sustainable mobility only grows in big cities with more than 250.000 inhabitants, and mainly in the city of Northern Italy, highlighting the persistent differences from the North and the South of the country (ISFORT, 2019). This critical situation, together with a long-lasting national history of attachment to car (as can be seen in the stable growth in cars through decades in Figure 3.2), brought to the decision to choose five Italian territories in which implement the focus groups. The five cases are characterised by profoundly different (economic, geographic, social) contexts, dimensions, infrastructures, covering the country from North to South:

- the metropolitan cities of *Milan* and *Rome*, the two biggest urban centres in Italy but with a deeply different level and quality of infrastructures and services (see Table 3.5, Figure 3.4, Figure 3.5);
- the province of *Reggio Emilia*, part of Emilia Romagna, a region known for good transport infrastructures and high cycling culture (Table 3.5). But what about the little towns far from the major historical city centres?
- the city of *Pesaro*, known as "The city of the bicycle", with one of the largest shares in Italy of people cycling (23%) and innovative cycling infrastructures (see Figure 3.6);
- the metropolitan city of *Catania*, in the Sicily island, the city with the highest number of vehicles per capita in Italy (715 per 1000 inhabitants - Figure 3.7)
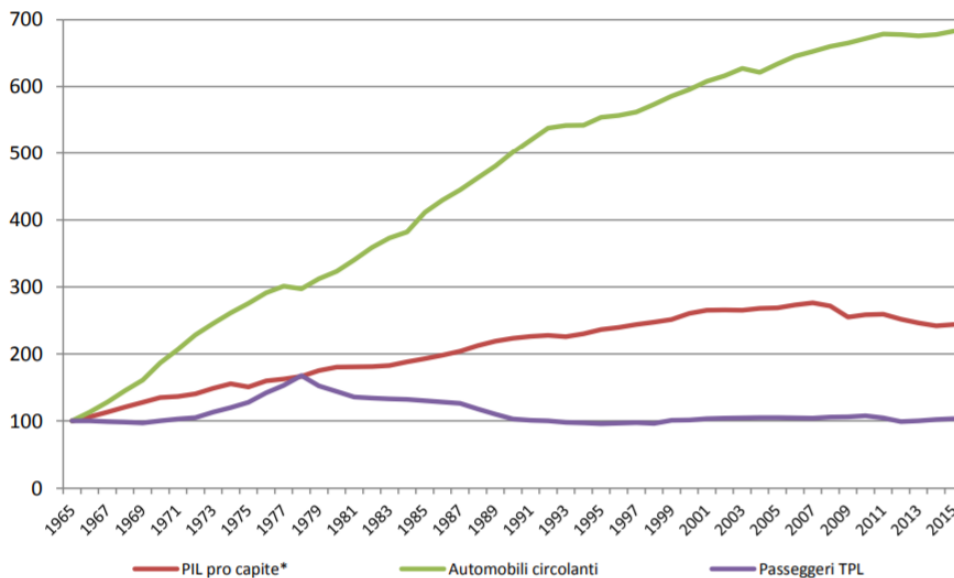

Figure 3.2. Circulating cars in Italy 1965-2015. GDP per capita (red), circulating vehicles (green), Public Transport passengers (purple). Index 1965 = 100; GDP: thousand €. Reference year: 2010. ISFORT 2009.
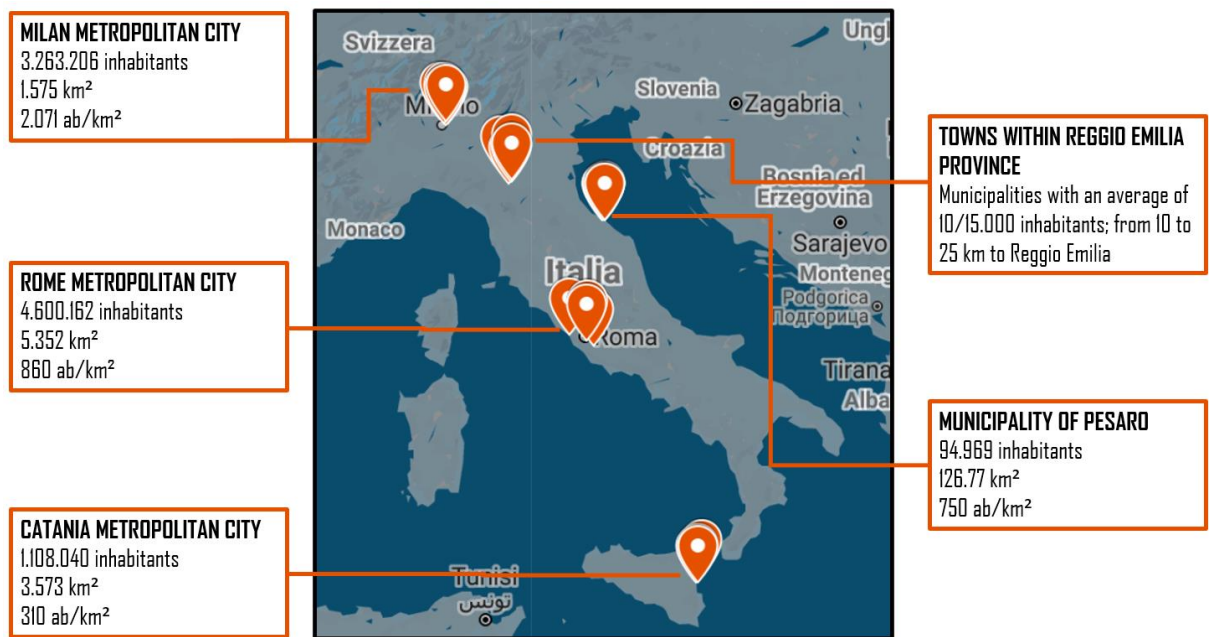
MILAN METROPOLITAN CITY
3.263.206 inhabitants
1.575 km²
2.071 ab/km²

ROME METROPOLITAN CITY
4.600.162 inhabitants
5.352 km²
860 ab/km²

CATANIA METROPOLITAN CITY
1.108.040 inhabitants
3.573 km²
310 ab/km²

TOWNS WITHIN REGGIO EMILIA PROVINCE
Municipalities with an average of 10/15.000 inhabitants; from 10 to 25 km to Reggio Emilia

MUNICIPALITY OF PESARO
94.969 inhabitants
126.77 km²
750 ab/km²

Figure 3.3. Cases overview, own elaboration. Sources: ISTAT (2019).

Table 3.5. Comparison on some main mobility indicators in the municipalities of Catania, Milan, Pesaro, Reggio Emilia and Rome[27].

	Municipalities of:				
	Catania	Milan	Pesaro	Reggio Emilia	Rome
Public transport supply (km-vehicle/inhabitant/year) (2018)	22	87	10	26	57
Meters of **cycle lanes** each 100 inhabitant (2018)	2,07	4,09	20,31	42,79	1,28
Cars each 1000 inhabitants (2018)	710	500	650	640	620
Motorbikes each 100 inhabitants (2018)	21	12	25	11	14
Total number of **car sharing** vehicles (2019)	110	3.201	-	-	2.303
Total number of **bike sharing** bikes each 10.000 inhabitants (2017)	-	93,1	6,1	-	4,2

[27] Beware that these are municipality data (not for the metropolitan cities or province). Source: Ecosistema Urbano 2019 – Legambiente.
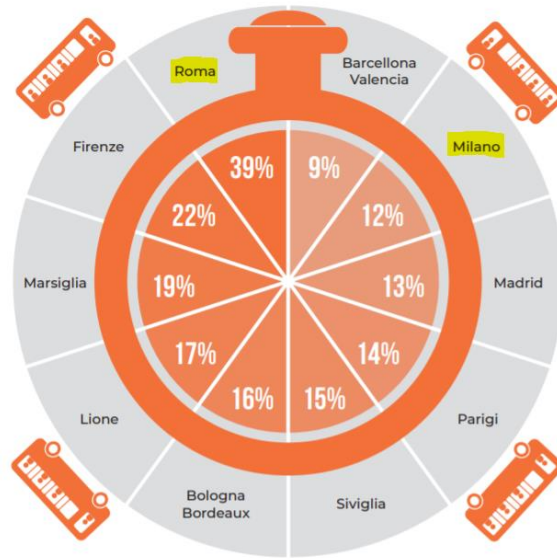
Figure 3.4. Time lost waiting for the bus in some main European and Italian cities. Source: Ecosistema Urbano 2019 Legambiente (from Moovit data).

Figure 3.5. Cities with the highest number of trips on public transport per inhabitant each year, 2018. Milan the second on the list; Rome not even in the first six. Source: Ecosistema Urbano 2019 - Legambiente.

Figure 3.6. Cities in Italy where cycling represents 20% or more of the modal split. It's possible to see the municipalities of Pesaro and Reggio Emilia among the 5 cities. Source: Ecosistema Urbano 2019, Legambiente (the report only considers and compares the "capoluoghi di provincia" in Italy)

Figure 3.7. Cities in Italy with the highest number of circulating vehicles. CT (Catania) is the first in Italy. It's also possible to see RM (Rome) and MI (Milan). Source: Ecosistema Urbano 2019, Legambiente.

Participants

The choice of the participants in a focus group is crucial. The aim of this kind of methodology is not to produce statistical generalizations (Corrao, 2000); the people involved are intended to be a sample by "theoretical/informed choice", that is to say a selection of groups and categories relevant for the research questions - aimed at "reflecting the diversity, not to obtain representativity" (Barbour, 2008:72). Therefore, in this case the objective was to reach a wide variety of cases and to represent diversity in terms of mode

choice, residential location (level of urbanization; centre/periphery), household composition/family situation (still living with parents, in a couple, living alone, with children...), occupation/social status, namely the variables more strongly related with car use.

In social research, it is common to set up little groups (3-8 people) - comparing with the marketing field, which usually employs bigger groups of 9-14 people. This is strategic to allow the interaction among all participants and the development of a discussion which includes the contributes of everyone. Too many people would make it difficult to catch the subjectivity of the single participants and distinguish the different voices or encourage everyone's involvement. Thus, the final choice has been to have 5 sessions with homogeneous groups by cohort (MM) and geographical area (the 5 case studies), with an average of 6-8 participants each session, balanced by gender, residential location (centre/suburbs); main mode (in general: car users / non-car users), household type (still living with parents; single household; living with a partner/with children...), and social status/occupation, with a total of 35 participants (Table 3.6). Only the Millennial generation was involved, covering all the age ranges in the cohort (1983-1988; 1989-1994; 1995-2000 – see Figure 3.8). The initial plan was to implement the same focus group also to the Baby Boomer cohort, but due to time/resources constraints, the choice has been to focus only to the Millennial cohort, and investigate the generational differences encouraging some discussion on their parents' habits and reactions to their choices.

The recruiting method implied the activation of a network of university professors, mobility managers, municipality officers, Facebook groups & personal social network channels, to spread the call for participants in the 5 territories and get help to find proper places in which implement the focus groups (university rooms, offices of the Municipalities etc.). The call was very simple, catchy and neutral (not speaking about sustainability, Baby Boomers or car dependence to influence the participants or create biases)[28] and making the participation more attractive with a "reward" (water bottles offered by the BASE office – "Bicocca Ambiente Sostenibilità Economia" of the University of Milan Bicocca[29]).

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[28] "*Call For Participants*: I'm Elena Colli and I am a PhD student in Urban Studies. I'm looking for 6-8 Millennial volunteers living in *Area of interest* for a focus group (group debate) of about 1.30h to discuss around daily mobility, car habits and life choices. *Date, time, place*. There are no special requirements except for a bit of critical thinking and the willingness to share your own experiences. As a reward for your precious time, at the end you will receive the brand-new Bicocca water bottles!"

[29] For which I'm very grateful to Massimiliano Rossetti of the BASE office, which was always available to provide the water bottles at any moment.

Table 3.6. Participants of the focus group "Millennials in Transition"

	Frequency (n°)
Gender	
F	17
M	18
Residential location	
City centre	20
Outskirts	15
Degree of urbanisation	
Small town (up to 25.000 inhab.)	7
Small-medium city (25.000-250.000 inhab.)	6
Large city (250.000-1.000.000 inhab.)	11
Metropolitan city (>1.000.000 inhab.)	11
Main mode	
Car	16
Public transport	9
Walking	2
Cycling	6
Motorcycle	2
Household type	
Living with parents	19
Living with partner	6
Living with partner & child(ren)	2
Shared flat	7
Single	1
Level of education	
Secondary education	10
Bachelor degree	7
Master degree	18
Occupation	
Employed	22
Unemployed	3
Student	10
Own a private car*	
Yes	17
No	18

*Intended for exclusive personal use. If we consider the ones who have a car available (e.g. shared with parents or others in the household) then the share is 21 Yes, 14 No.
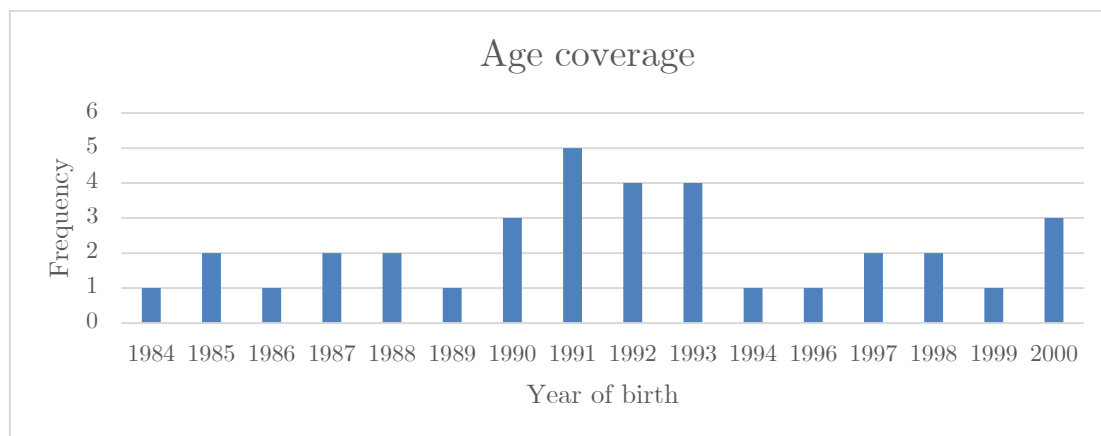
Figure 3.8. Distribution of age of the participants.

Structure of the session

Duration	1.30h
Introduction	Brief introduction of the research & aim of the focus group; explanation of how a focus group works ("this is not a single interview or an exam: this is a group discussion which starts from your own experiences: there is no right or wrong, feel free to share your opinions and interact with each other")
Wrap-about	Participants creates their own place cards with their names and they start a wrap-about with self-presentation, starting from the researcher itself: name, age, living area, household type, most used mode
PART 1 **Imaginary linked to the car & behaviour change** (20-25 minutes)	**Kick off questions:** *Could you imagine to live without a private car?* *How many of you have a car? Why? What are your purchase intentions?* Topics to touch: car dependency, car as a status symbol, role of car sharing / EVs
PART 2 **Imaginary linked to other modes** (public transport, bike, micro-mobility) (25-30 minutes)	**Kick off question:** *If I show you this image: what do you think?* *(laugh, agree, disagree...)*

Topics to touch: imaginary linked to public transport; experiences; how, when, why they use it or don't use it

...And what about this article from "Rolling Stones Italia"?
(laugh, agree, disagree...)
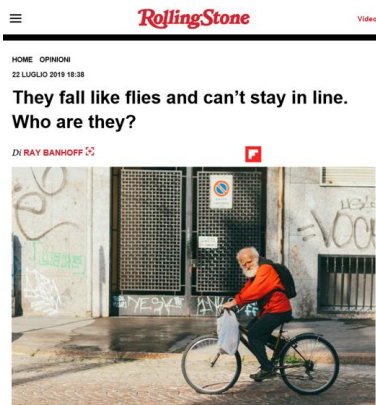
Topics to touch: imaginary linked to bike - sport/leisure or way of transport?; experiences; how, when, why they use it or don't use it

And finally... have you ever seen these? What do you think?

	Topics to touch: e-scooter & co: do you know/use it, would use it, why, for what
PART 3 **A comparison over time: past...** **and future** (25-30 min)	**Kick off questions:** *Think about where you are currently living and how you move. How do you see yourself in 5 years?* Will it change? Where will you be? Centre, suburbs, other city...? What would make you move? *Let's now have a look at the past: thinking about your parents, do you think there is a difference in the way of moving and life choices in general (related to work, residence, buying a house, build a family...)?*
Expected Outcome	The objective is to produce a debate around the topics of sustainable mobility / car dependence and investigate: • Emergence of *shared values / arguments* around the topics of private car and alternative modes among i) similar personal situations (household type, residential location, age class etc.) and ii) territorial context. • What *process* there is behind (real or potential) behaviour change (policies, life context, personal biography, education...) • Verification/deepening of some *trends* identified in the quantitative analysis: motivations behind the decline in car use / ownership and licensing; life choices (residential choice, family prospects) and differences with the Baby Boomers cohort.

To integrate the experience, each trip towards each city of the case studies was always completed with an observation of the territory, keeping an eye on mobility services, policies and infrastructures, documenting with pictures when possible (Figure 3.9).
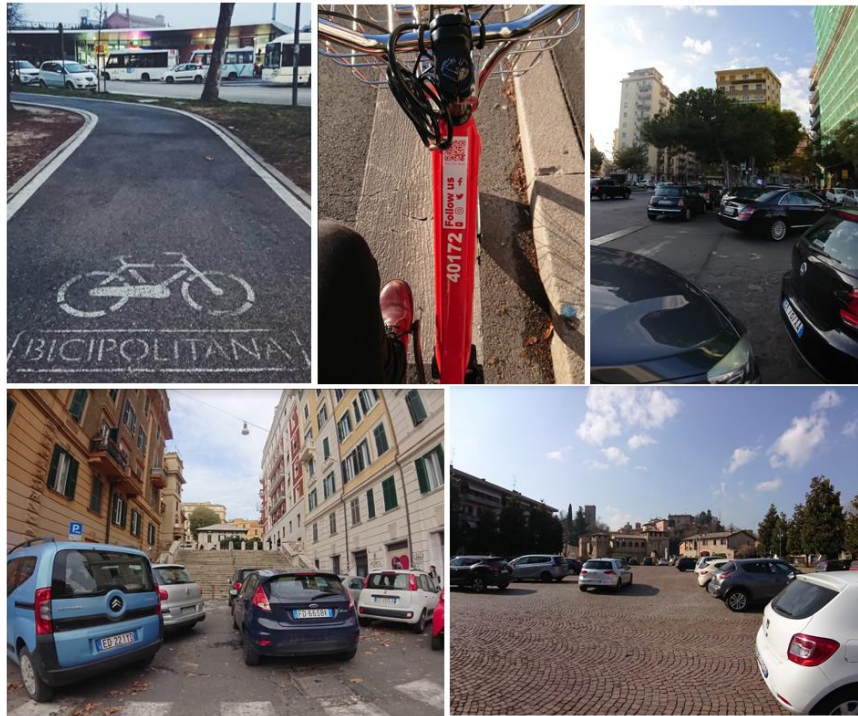
Figure 3.9. Documenting mobility in each case study. Photographs of (from the top left) Pesaro, Milan, Catania, Rome, Reggio Emilia town in the suburban area (Castellarano). Own pictures.

3.3.3   Methods of analysis

All the sessions have been recorded (both audio and video) and transcribed, ensuring the privacy, confidentiality and safe storage of recordings (Consent Form available in the Annex E). The material has been analysed with NVIVO software[30] through the techniques of i) segmentation and classification (coding) and using the available features for text analysis (e.g. word frequencies and hierarchy charts). Some word frequency features such as "word clouds" allowed to highlight the *recurrent themes* (frequency) and *visualize the vocabulary* dedicated to a specific topic/issue. Since the focus groups took place in Italy and were implemented in Italian, the results of the frequency analysis has been translated verifying case by case the specific context of meaning[31]. The goal was to identify similarities

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[30] NVIVO website: https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

[31] Considering the multiple meanings of some words e.g. "comodo" meaning some times "comfortable" and some other times "convenient", while "conveniente" meaning "cheaper". The different shades in the Italian vocabulary has been considered during text analysis and translation process.

and differences in the variety of cases represented by the sample; grasp the recurrent themes and issues, and organise the discourse into theoretical categories (Table 3.7) in order to support some trends emerged in the quantitative analysis, understand more deeply the role played by changes that occur at different stages of life (integration into the world of work, setting up home, birth of a child, etc.) and intercept the motivations behind modal choice and car attachment of Millennials, in order to further investigate their difference with the Baby Boomer cohort.

Table 3.7. Main categorisations (with NVIVO "nodes")

	Categories
Factors determining travel choices (Stradling & Anable, 2008) (Cfr. par.1.4.1)	**Opportunity** (how can I make those journeys?)
	Obligation (what journeys do I have to make?)
	Inclination (how would I like to make those journeys?)
Factors determining car dependence (Mattioli, Anable, & Vrotsou, 2016) (cfr. par.1.3.1)	**Macro** Car dependent place
	Micro Car dependent person
	Meso Car dependent trip
Imaginary behind modes	**Positive** (+) and **negative** (-) sections created for each mode
Main factors determining car choice (coming from the logistic regression analysis)	Residential area, Occupation, PIIGS region, Presence of children, Cohort, Household type, Income, Education

4 "Ok Boomer": Cohorts in comparison

This chapter is dedicated to the results of the quantitative analysis of the European databases previously exposed. It is composed by four main parts: i) it starts with an analysis of the life circumstances of the two cohorts (referring to the type of household, economic status, job conditions, residential location, life expectations) in order to assess their positioning in the life-course and contextualise their ongoing transitions, to better understand their mobility profiles (par.4.1); ii) it will then be analysed their travel behaviour and attitudes towards car (in terms of mode choice, duration, distance, frequency etc.) and attitudes towards more sustainable ways of travel (multimodality, slow modes, ride sharing, car sharing services and inclination to EVs), adding also information on what has been called their "car mobility capital" (car owning, license, purchase planning) (par. 4.2); iii) it will then be explored the geography of behaviours, looking at national and regional differences among the European territory with aggregated analysis on five European clusters of regions and visualisation of data on thematic maps (par. 4.3); iv) and finally, to sum up all the characteristics explored in the previous paragraphs and verify the presence of a cohort effect, a logistic regression analysis will be implemented controlling for the main key (individual and territorial) variables detected along the chapter (par. 4.4). As anticipated, the chapter is mainly built on the study of the Millennial cohort (life context and mobility behaviours) based on its comparison with the Baby Boomer cohort, trying to figure out their main differences and contrasts. From here the title "Ok Boomer", deriving from a catchphrase and "meme" which became popular among teenagers and young adults in 2019 to dismiss or mock attitudes typically associated with people of the Baby Boom generation[32]. Are they so divergent? Let's hope this chapter will help to answer this question and the ones below.

Question	Content	Paragraph
What are MM & BB current life circumstances and how are they changing?	Assess their positioning in the life-course and contextualise ongoing transitions to better understand behaviours	Par. 4.1
What are their differences and transformations in mobility habits and attitudes?	Analysis of their daily mobility habits (characteristics of most frequent trip), attitudes towards car and sustainable ways of travel	Par. 4.2
What are the differences in these trends across the	Aggregated analysis on five European clusters of regions exploring geographies of behaviours	Par. 4.3

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[32] It also have its dedicated Wikipedia page: https://en.wikipedia.org/wiki/OK_boomer

European territory?		
Is there a cohort effect in the attachment to car?	Logistic regression analysis on car use, controlling for key variables	Par. 4.4

4.1 Transitions in life circumstances

4.1.1 Economic status and life expectations

In general, socio-economic conditions have improved for the European population in the last four years, as an effect of the general economic recover after 2008 crisis. According with Eurostat data, the median equivalised net income in EU28 has grown by 9.56% from 2013 to 2017[33]. This is also confirmed by the Eurobarometer data about the (perceived) level of economic difficulties (Figure 4.1)[34]: both cohorts experienced a similar fall in the share of unemployed and also of people with serious economic difficulties, with MM reaching the level of BB; and a rise in those who never had economic difficulties in the last year, higher for MM (+14% compared with +7% of BB, which still remain the ones with the highest share). This is explained also by the great changes in the employment status (Figure 4.2): MM begin to massively exit the studying period and enter the labour force (+30.8%), with a constantly growing income (Figure 4.3) [35] – and it is interesting to note that it is now crossing the path of the BB's current income, while it's not possible to predict if it will continue to rise reaching the apex they had in the previous decade – while BB are largely entering retirement (+36.4%), reflected in a general decline in the available income, which more or less stabilised from 2015 on.

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[33] Data retrieved from Eurostat Data Explorer
http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do
[34] Eurobarometer data has been weighted on the basis of EU28 weight, variable w23 on both datasets.
[35] As anticipated in chapter 3, analyses on EU-SILC data were done weighting data by the variable PB040 (Personal cross sectional weight), which is used for all individuals in P file (personal files with information from register and interview) containing all members 16+ of respondent households and for estimation purpose (cross sectional target population of all individuals 16+ living in private households).
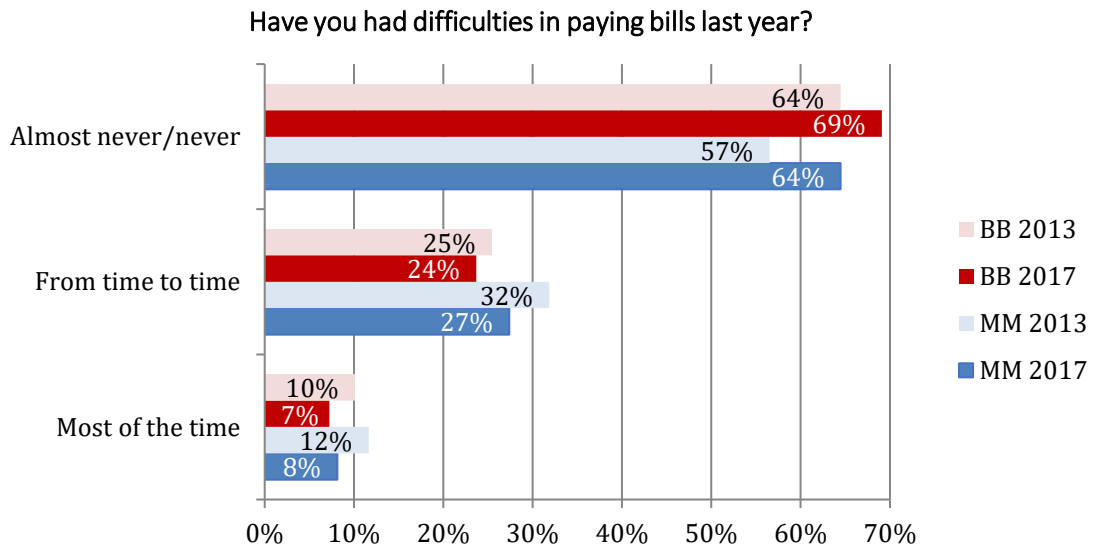
Have you had difficulties in paying bills last year?

Figure 4.1. "Have you had difficulties in paying bills last year?". Eurobarometer 79.4 (2013) and 88.1 (2017).

Occupation

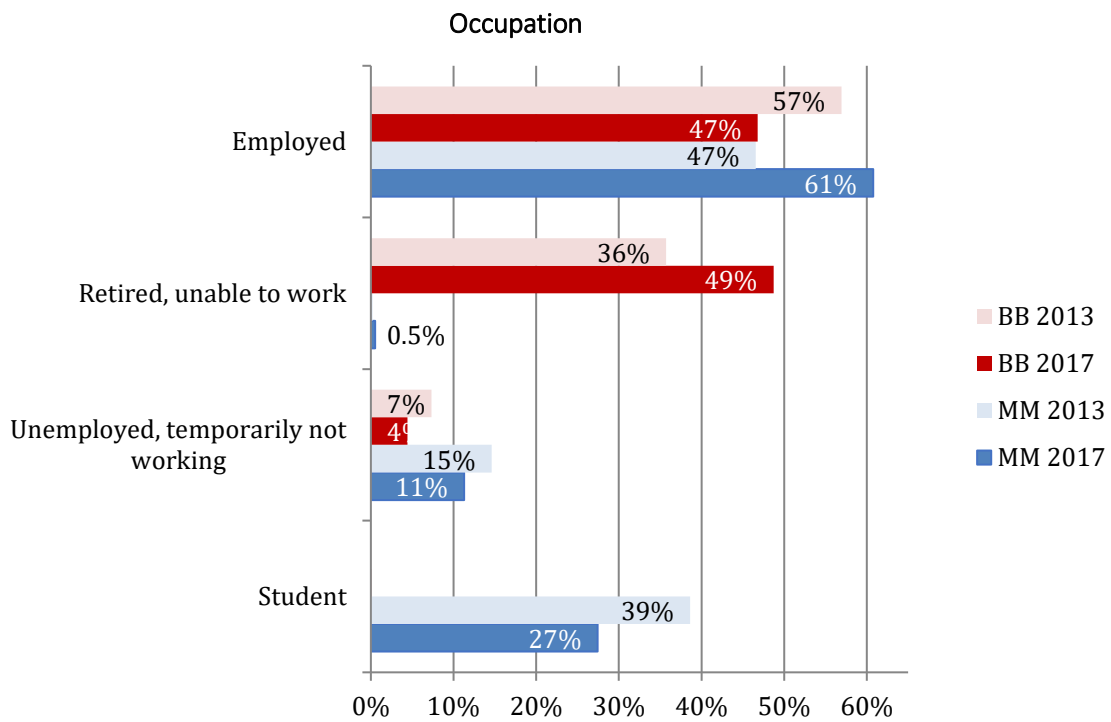Figure 4.2. Occupation. Eurobarometer 79.4 (2013) and 88.1 (2017).

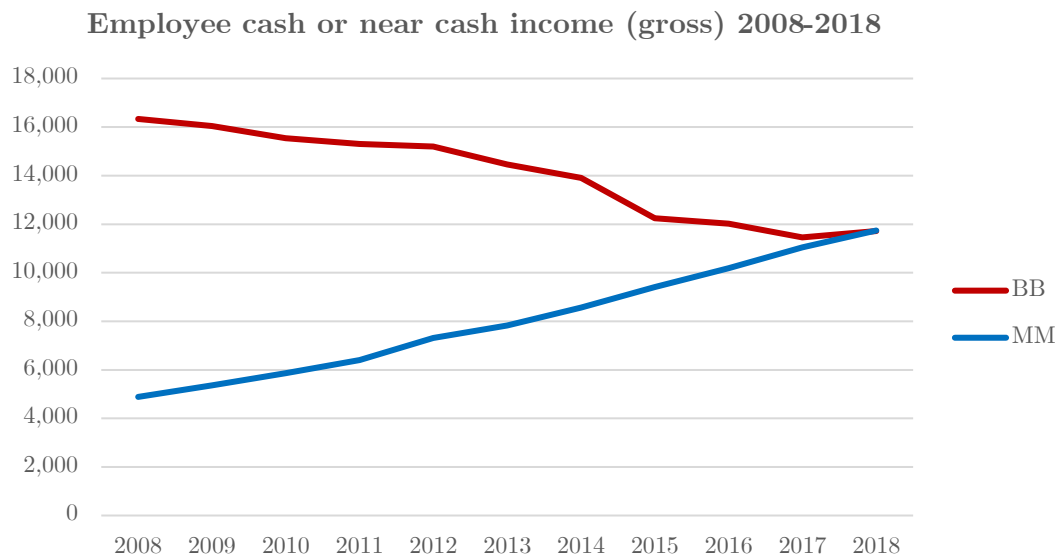**Employee cash or near cash income (gross) 2008-2018**

Figure 4.3. Employee cash or near cash income (gross) 2008-2018. EU-SILC 2008-2018.

Furthermore, even considering that many MM are still studying, they already have much higher levels of education if compared with BB's highest education attended (Figure 4.4). BB have larger share of primary and lower secondary education levels, while MM are already above their levels in secondary and tertiary education (e.g. share of people with a BSc or short cycle degree: 20.2% of BB and 27.5% of MM), which is expected to grow further.

It is also interesting to note that the enlargement of the studying period largely postponed their first approach with the job market. Looking at Figure 4.5, we see two visible jumps in the share of MM who had ever worked in their life: in 2008-2009 from 23% to 27.4% (first wave of entrance in the adult age for those born in the '90) and then in 2017-2018 from 35.5% to 40.4%, with the second wave of people born in 2000). Particularly relevant is also to note that this means that in 2018, almost the 60% of MM have never worked before.
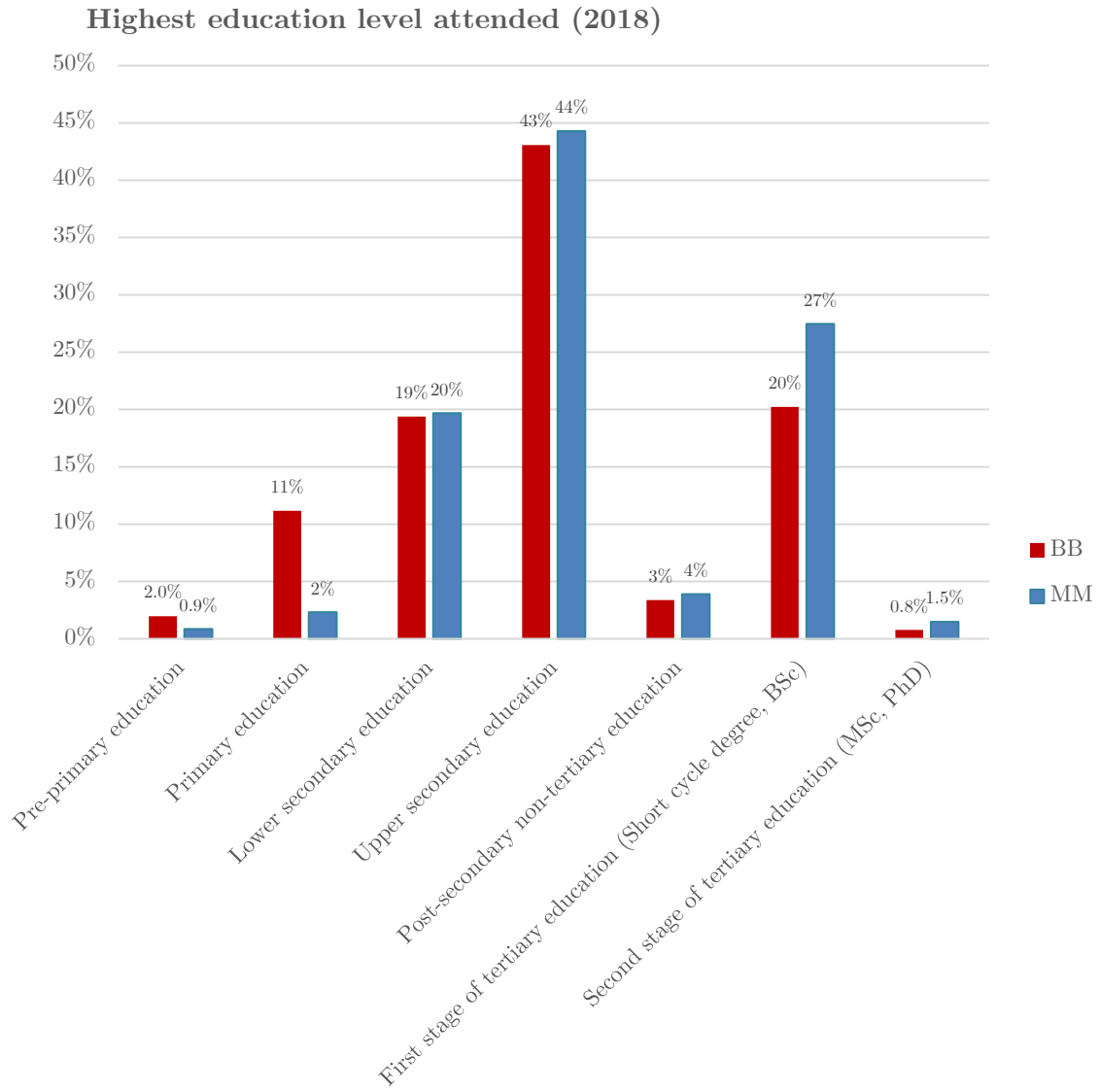
Highest education level attended (2018)

Figure 4.4. Highest education level attended (2018). EU-SILC 2018.

Millennials that answered YES to: Did you ever worked before?
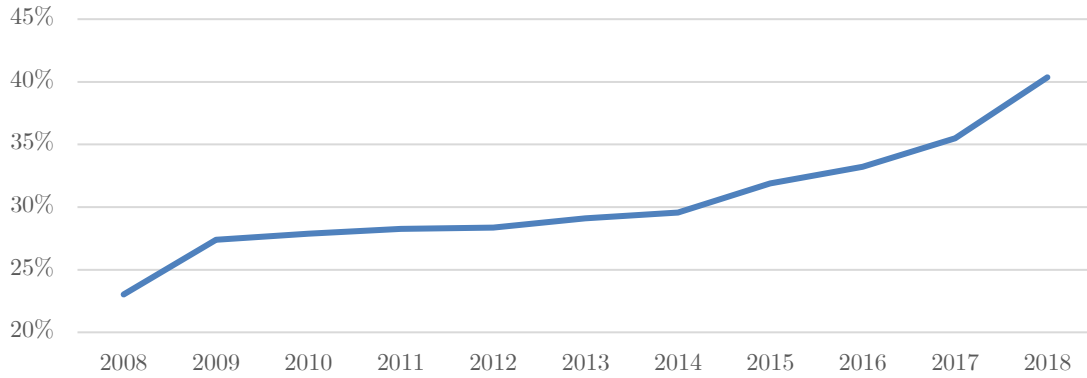

Figure 4.5. Millennials that answered YES to: Did you ever worked before?. EU-SILC, 2008-2018.

In fact, if we compare the age at first regular job of BB and MM (Figure 4.6), we note 1) that MM had a later peak (around 18-20 years old, while BB had it around 16-18) and that the curve fell less rapidly after age 20. Quality of the job is also something worth to analyse: data confirms what anticipated in literature (Figure 4.7), with MM having more precarious job conditions, with a share of people with permanent job contracts that stays constantly under 65% (oscillating between 60-65%) while BB remain stable around 90%, which appears to be a very remote percentage for MM – at least in the near future.
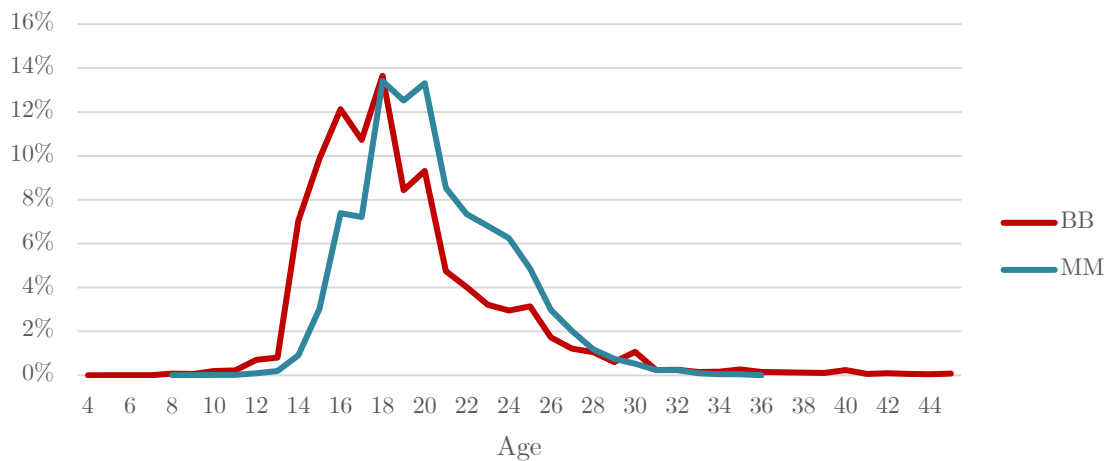
When began first regular job (age)

Figure 4.6. When began first regular job (age). EU-SILC 2018.

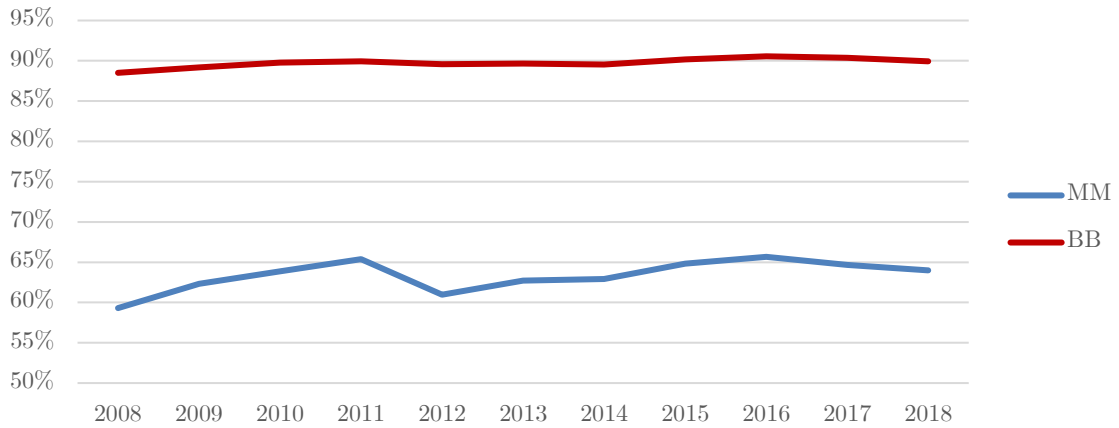**Permanent job work contract 2008-2018**

Figure 4.7. Permanent job work contract 2008-2018. EU-SILC 2008-2018.

Finally, if we look at life expectations for the next five years (Figure 4.8), it's possible to see a growth in optimism of the MM, among which we can see greater hopes and expectations about their future life conditions (53% thinks that in 5 years they'll be better, versus 15.2% of BB), suggesting that they are somehow confident that their conditions may improve and so their habits may experience a change, while BB are more inclined to see their future conditions as stable or worse. The rise in BB who see their future "worse" could be also due to the insurgence of physical limitations: as shown in Figure 4.9, there has been a substantial rise in BB who feel limited or strongly limited in activities, which in the last decade grew from 25.7% in 2008 to 32.3% in 2018.

In your opinion, in 5 years' time, do you think that your life conditions will be better, worse, or the same than today? (2017)
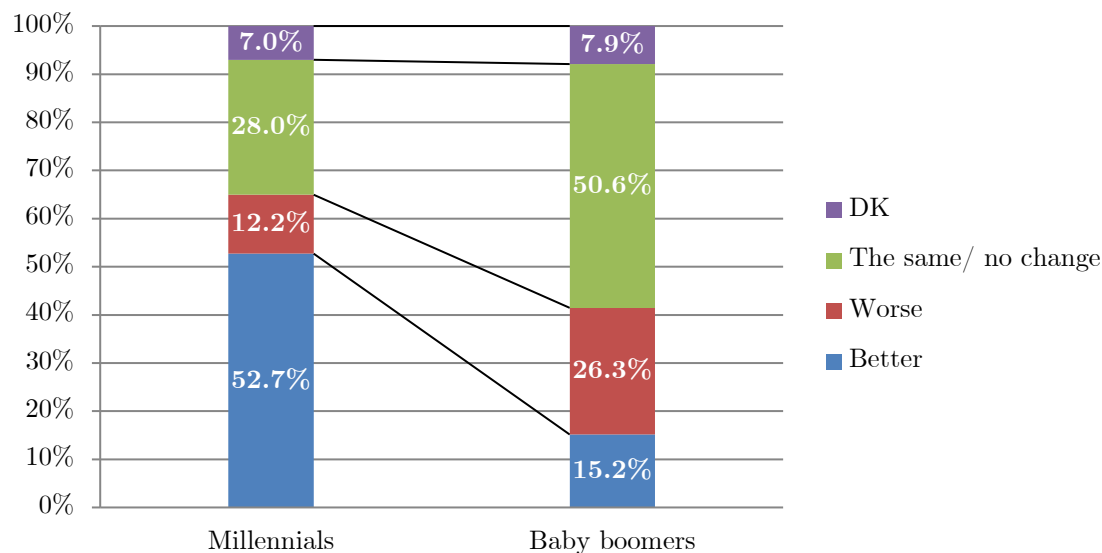

Figure 4.8. Life expectations in 5 years. Eurobarometer 88.1 (2017). "DK" meaning "Don't know".

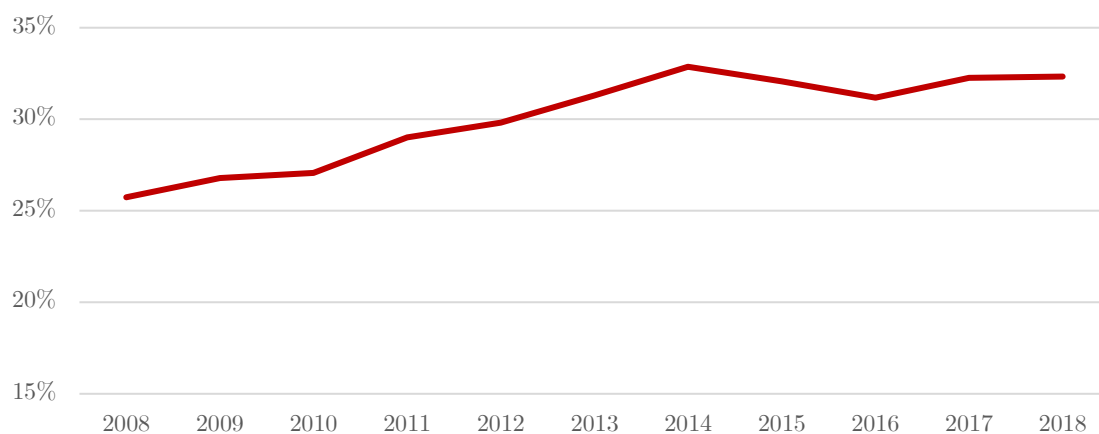**Baby boomers that feel limited or strongly limited in activities (2008-2018)**

Figure 4.9. Baby boomers that feel limited or strongly limited in activities (2008-2018). EU-SILC 2008-2018.

4.1.2 Family type

Other than in economic and occupation conditions, both cohorts are also experiencing great changes in their family structure in recent years (Figure 4.10): among BB we see a

fall in couples with children (-27.4%) and a growth in couples without children, which is reconfirmed as the most common family status (49.5%). Conversely, the majority of MM is still single (not married nor co-living with a partner, 44.7%), and we see a considerable growth in couples with children (from 16.2% to 23.6%) and a moderate one in couples without children, which compensate the fall in single MM, as a sign that they are on their way to build families.
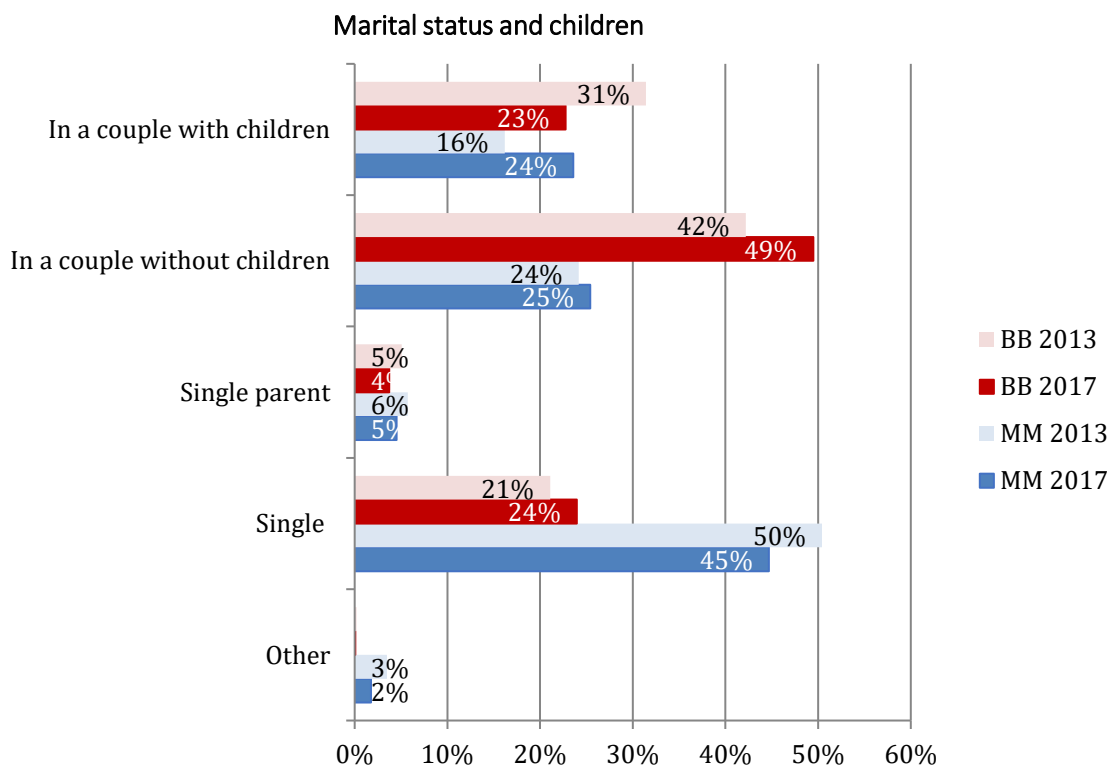
Marital status and children

Figure 4.10. Marital status. "In a couple" meaning married or living with partner. "Single" meaning not married nor living with partner. Variable "Marital Status – Recoded Children" d7r3 Eurobarometer 79.4 (2013) and 88.1 (2017).

This is confirmed also by the time series (Figure 4.11), which shows a steady rise in MM in a consensual union (married or co-living). As expected, the marital status of BB remains more or less unchanged, with the exception of the slow rise of widowed people living alone (which goes in parallel with the decline of BB in a couple, as shown both in Figure 4.10 and Figure 4.12).

Baby Boomers - Marital status (cfr. with MM in a couple)

never married

married

separated

widowed

divorced

MM in a consensual union (with or without a legal basis)
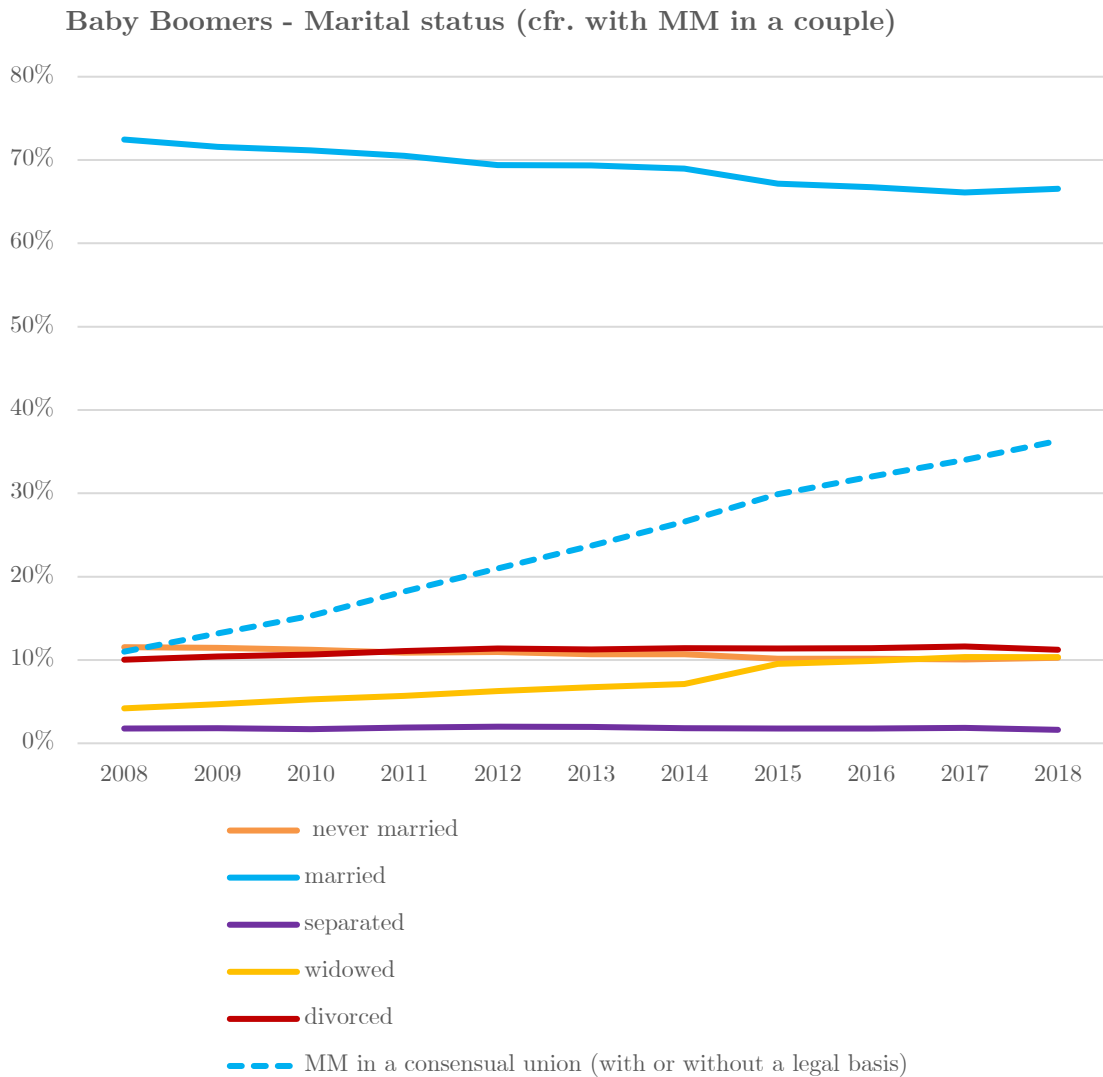
Figure 4.11. Baby Boomers - Marital status (cfr. with MM in a couple). EU-SILC 2008-2018.

Looking more in depth in the household type time series (Figure 4.12), it's clear to see how dynamic and changing is the situation and context of MM (especially if compared with BB). The two opposing trends (the dotted lines) show a steady fall in MM living with the parents, mostly to live with the partner (fast-growing green line), and also in part to live alone (red line). Particularly interesting is to note, however, that in 2018 (meaning people aged 18-35) almost a half of MM is still living with parents. Nonetheless, it is important to precise that the MM generation is composed by sub-cohorts, which are living very different phases of life (every five years there is a lot of stuff happening in the 16-35 years old life

span!). So, if we look at the disaggregated data in Figure 4.13 it is possible to see that there is a huge difference among the youngest MM (18-23 years old, nearly all still living with the parents, 87.3%) and the older ones (20.5%). The percentage remains quite high for the ones aged 24-29 (45%), and it diminishes mostly because compensated by the moving with the partner, while single households remains more or less stable around 20% starting from the middle MM cohort.
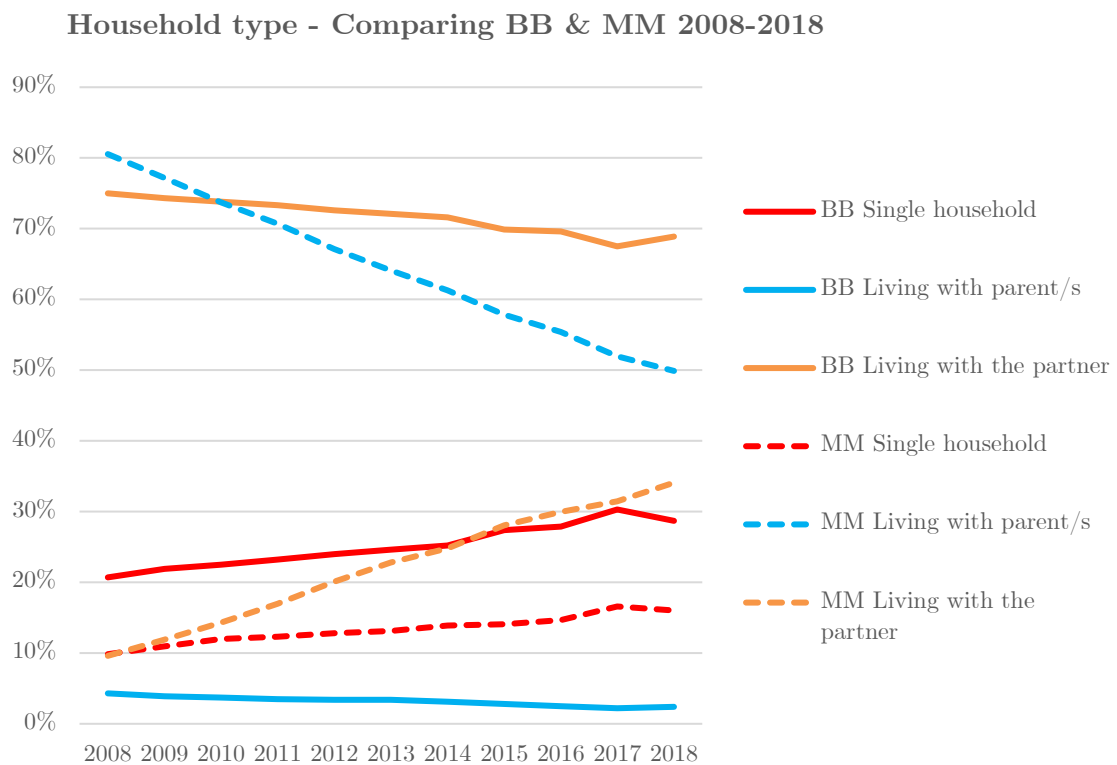
Household type - Comparing BB & MM 2008-2018

Figure 4.12. Household type - Comparing BB & MM 2008-2018. EU-SILC 2008-2018.
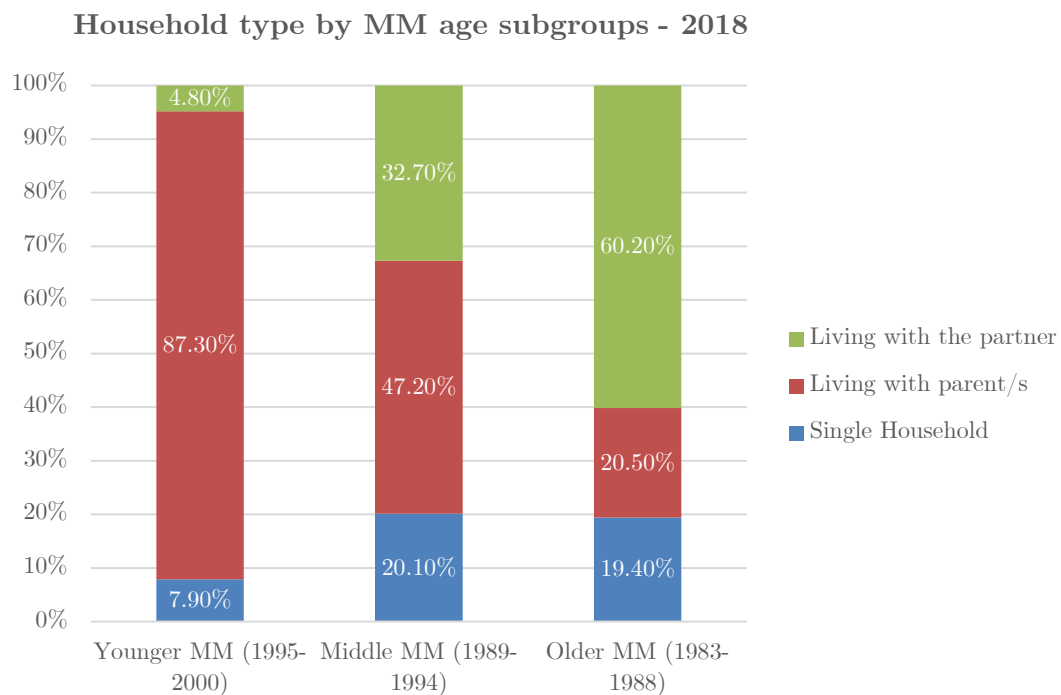
Household type by MM age subgroups - 2018

Figure 4.13. Household composition by MM age subgroups – 2018. EU-SILC 2018.

To conclude this section, it is impossible not to dedicate a rapid glance at the European differences in the age of "flying the nest", even if territorial differences will be better described and investigated in par.4.4., reflected in the mobility habits. As shown in Figure 4.14, there is a difference of more than 10 years in the average age in which young people leave parent's house between the Nordic countries (Sweden, Denmark, Finland, Belgium among others in the first rows, at around 21 years old) and the Mediterranean ones (around 30/31 years old in Spain, Greece, Italy, Croatia).
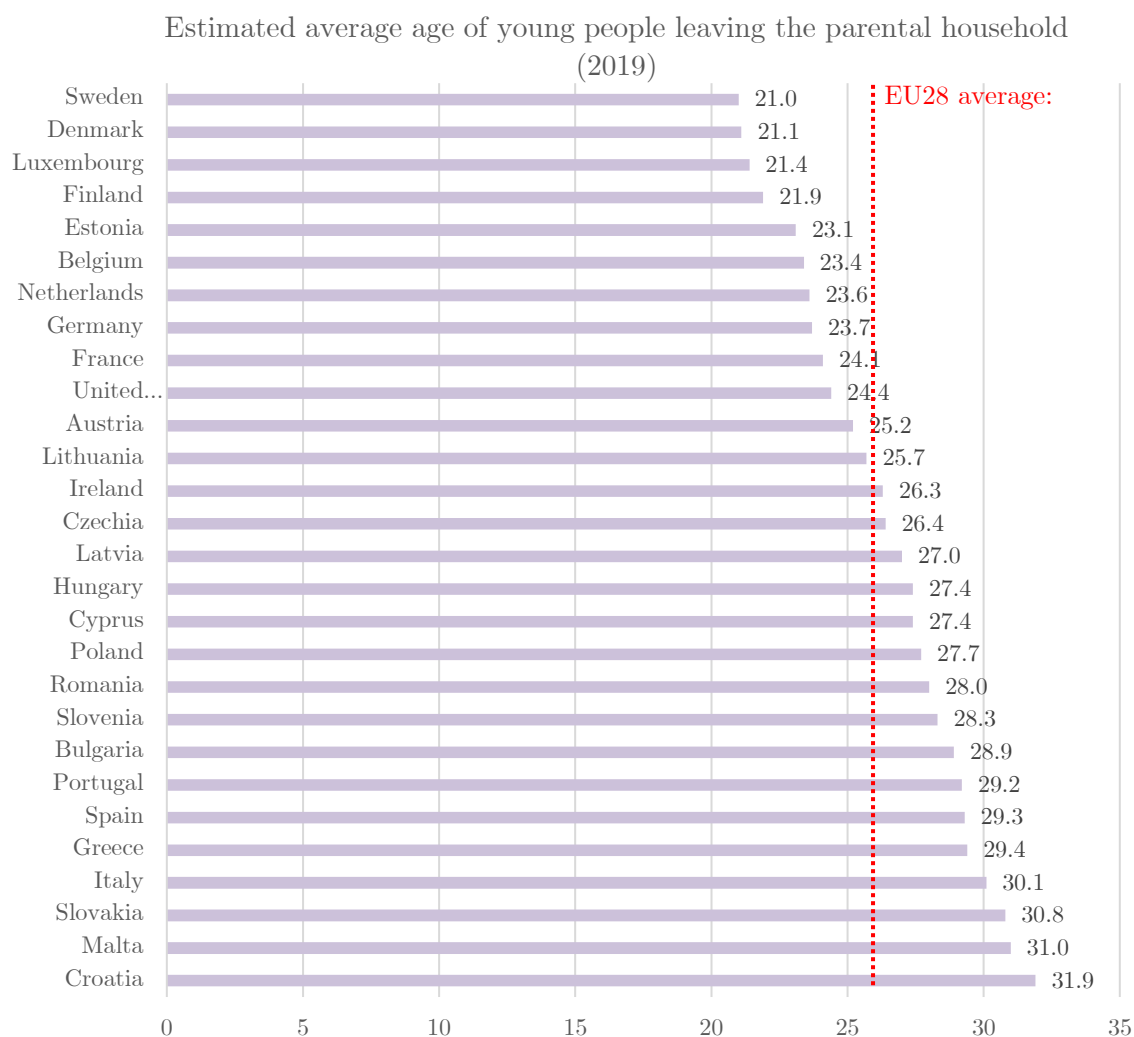
Estimated average age of young people leaving the parental household
(2019)

Country	Value
Sweden	21.0
Denmark	21.1
Luxembourg	21.4
Finland	21.9
Estonia	23.1
Belgium	23.4
Netherlands	23.6
Germany	23.7
France	24.1
United...	24.4
Austria	25.2
Lithuania	25.7
Ireland	26.3
Czechia	26.4
Latvia	27.0
Hungary	27.4
Cyprus	27.4
Poland	27.7
Romania	28.0
Slovenia	28.3
Bulgaria	28.9
Portugal	29.2
Spain	29.3
Greece	29.4
Italy	30.1
Slovakia	30.8
Malta	31.0
Croatia	31.9

EU28 average:

Figure 4.14. Estimated average age of young people leaving the parental household (2019). Source: Eurostat Data Explorer.

4.1.3 Degree of urbanisation

The degree of urbanisation is a classification of local administrative units (LAUs) that indicates the characteristics of a particular area, based on a population grid composed of 1 km² cells (and clusters thereof), identifying: i) urban areas — defined here as the sum or average of cities and towns and suburbs; ii) cities (densely populated areas[36]) — where at least 50 % of the population lives in urban centres; iii) towns and suburbs (intermediate

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[36] Contiguous grid cells of 1km2 with a density of at least 1.500 inhabitants per km2 and a minimum population of 50.000

density areas[37]) —where at least 50 % of the population lives in urban clusters (at least 5.000 inhabitants), but is not classified as a city; iii) rural areas (thinly populated areas[38]) — where at least 50 % of the population lives in rural grid cells. The use of identical grid cells across the whole of the EU territory eliminates distortions that may be created when using local administrative boundaries (which may vary considerably in size) (Eurostat, 2016).

With regard to the degree of urbanization of MM and BB, data from 2018 (Figure 4.15) confirm the fact that MM tend to live in more urbanised area, with nearly a half of them living in densely populated area (48% versus the 37% of BB), while a larger share of BB tends to live in thinly populated area (33% versus 26% of MM). It's important to point out that in this section, only MM which have left parental house has been considered. This has been specifically done to highlight "preferences" (since if you still live with your parents this will mostly reflect *their* residential choice).
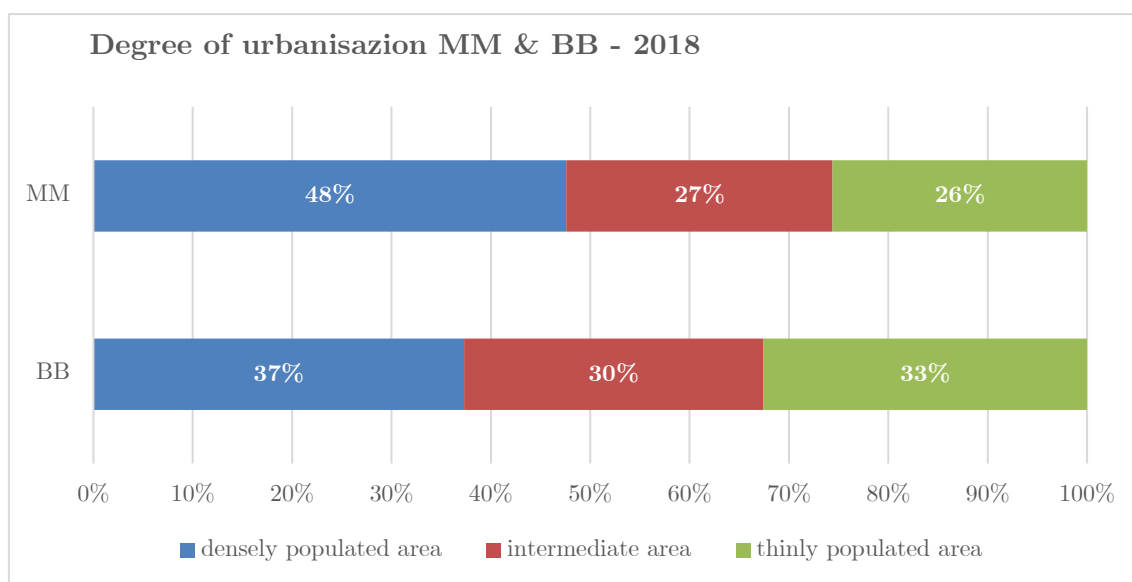

Figure 4.15. Degree of urbanisation MM & BB - 2018. Where MM considered where only the ones not living with their parents. EU-SILC data.

But if we have a look at the trend over the last ten years (Figure 4.16), we can clearly see that since 2008 the degree of urbanisation have actually declined for both generations; MM living in densely populated areas reached a peak of 58% in 2009, which have then gone

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[37] Clusters of contiguous grid cells of 1km2 with a density of at least 300 inhabitants per km2 and a minimum population of 5.000

[38] Grid cells outside urban clusters.

through a steady decline in the following years, in favour of a rise especially in intermediate areas (dotted blue line) and more recently also in thinly populated areas (green dotted line). So, the picture we got is one of a more urbanised generation, but that is maybe slowly reaching the levels of its predecessors' residential choices. BB, in fact, were less urban since the beginning (46% in 2008) and kept losing urbanised residents, especially compensating with a rise in intermediate areas.

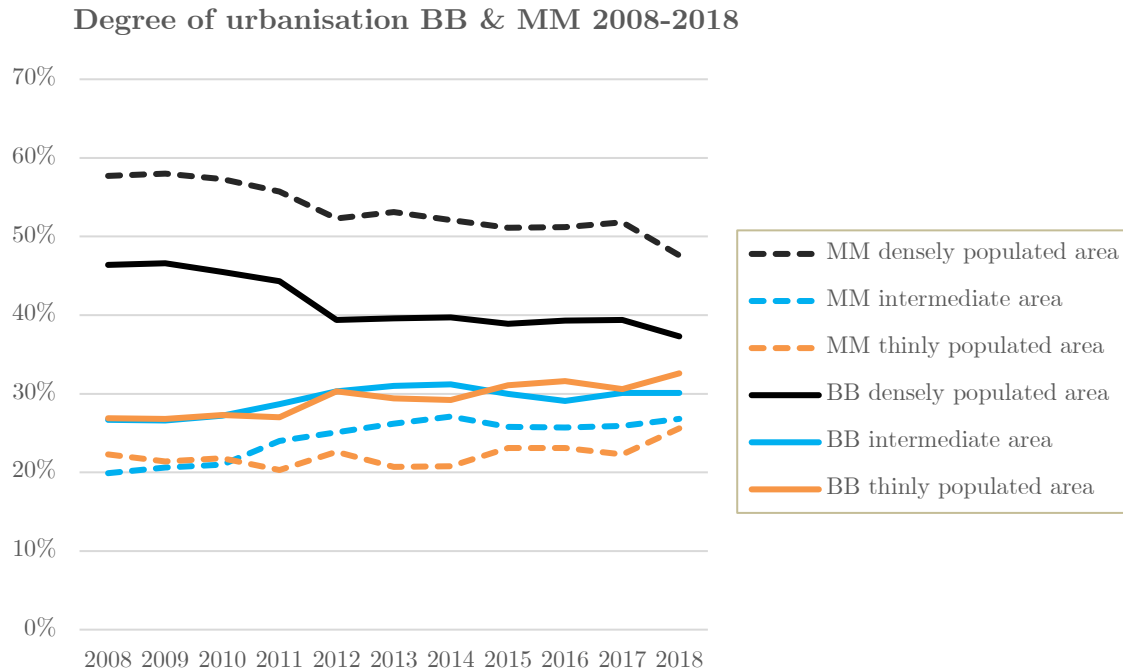**Degree of urbanisation BB & MM 2008-2018**

Figure 4.16. Degree of urbanisation - BB & MM 2008-2018 time series. Where MM considered where only the ones not living with their parents. EU-SILC data.

As a conclusion to this first paragraph, a short recap of the conditions and transitions in life circumstances of the two cohort analysed above is given in Table 4.1. It will be useful to keep these in mind while diving into the mobility behaviours described in the following paragraph.

Table 4.1. Transitions in life circumstances of the two cohorts: recap.

	Millennials	Baby boomers
Socio-economic status	Mostly employed or students, fostering their economic status with the entrance in the labour force, reflected in a constantly growing	Largely entering retirement (mostly employed and retired), reflected in a slight decline in income (which recently stabilised), but that is still

	income – but still not at the level of economic security of BB. Higher educated (mostly secondary and first stage of tertiary), but precarious job conditions. Optimistic about future life conditions.	higher than MM. Generalised permanent job contracts. Less educated (mostly secondary education). Neutral/pessimistic about their future life conditions, also possibly linked to the insurgence of physical limitations
Family status	Mostly single, but accelerating on their way to build families with a steady rise in consensual unions and couples with children, even if there is still a large part living with the parents.	Mostly couples without children, with a slowly rising share of widows living alone.
Degree of urbanisation	More urbanised, but following a steady decline towards less urbanised areas.	Slightly less urbanised and keeping the trend.

4.2   Transitions in mobility habits: comparison of travel habits and attitudes towards car (2014-2018)[39]

4.2.1   Most frequent trip

Data about the main mode of transport confirm the fact that BB have a larger share of car users (60.4% versus 46.1% of MM, in 2018), while MM tend to use more combination of modes, public transport (especially the train) and, to a lesser extent, cycling and car sharing services (Figure 4.17).

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[39] All graphs and tables in this paragraph are personal elaboration of data coming from JRC Travel Surveys (2014; 2018) weighting data by EU28 weight (except for the time series coming from EU-SILC when indicated, which covers more years).

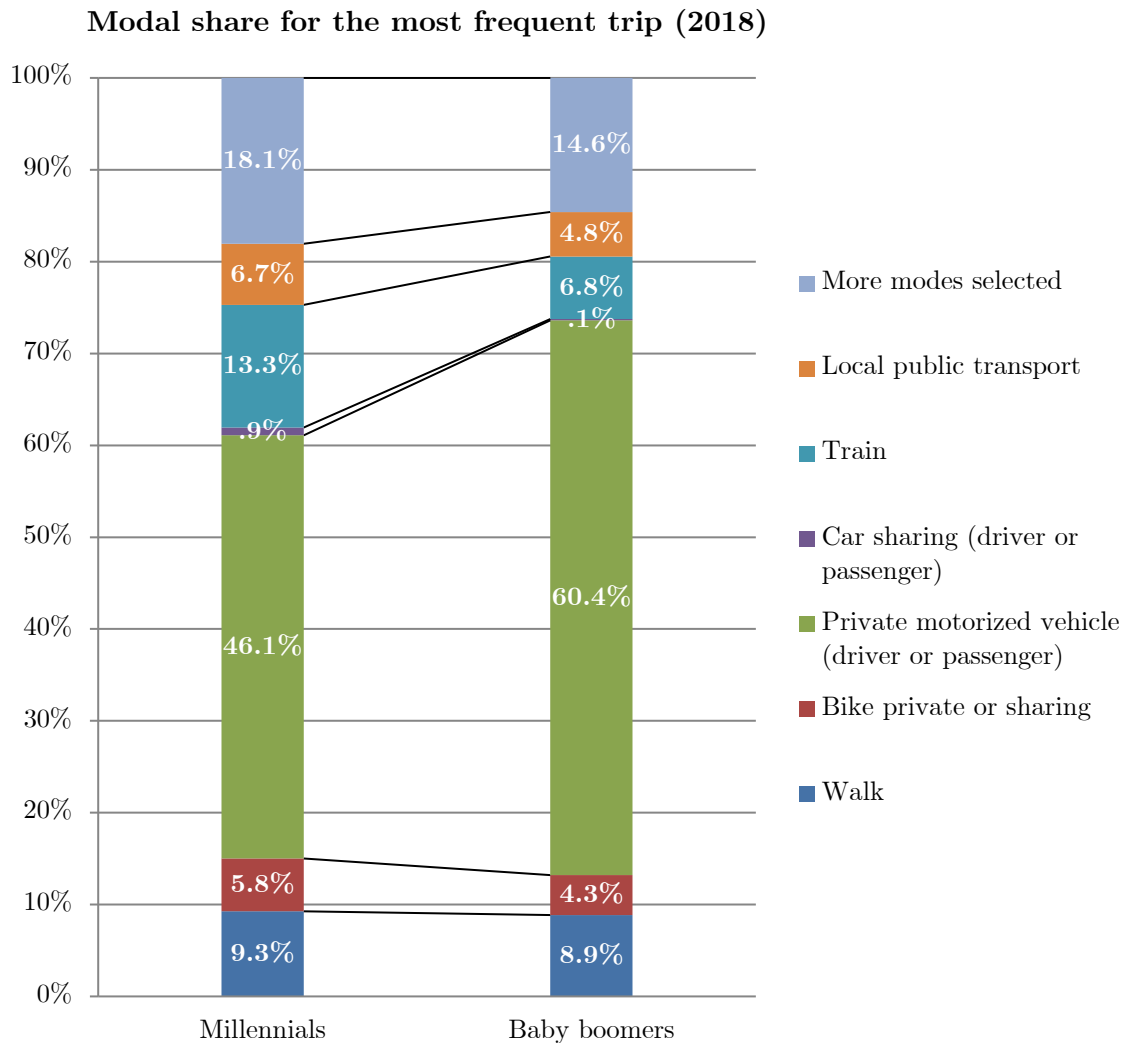**Modal share for the most frequent trip (2018)**

Figure 4.17. Modal share for the most frequent trip (2018). JRC Travel Survey 2018.

If we look at how mode choice evolved between 2014 and 2018 (Figure 4.18), we see some general changes among both cohorts, more pronounced for MM: a considerable fall in multimodality (-26.4% MM, -24,3% BB) and local public transport, plus moderate in walking. What is gaining passengers is mostly the train (both cohorts doubling the share, reflecting Eurostat statistics which see passenger transport by rail in the EU continuing its

growth in 2017 for the fifth year in a row[40]) and the private motorised vehicle, especially for MM (+15.4%, BB +8%), plus a weak rise in bike use for MM.

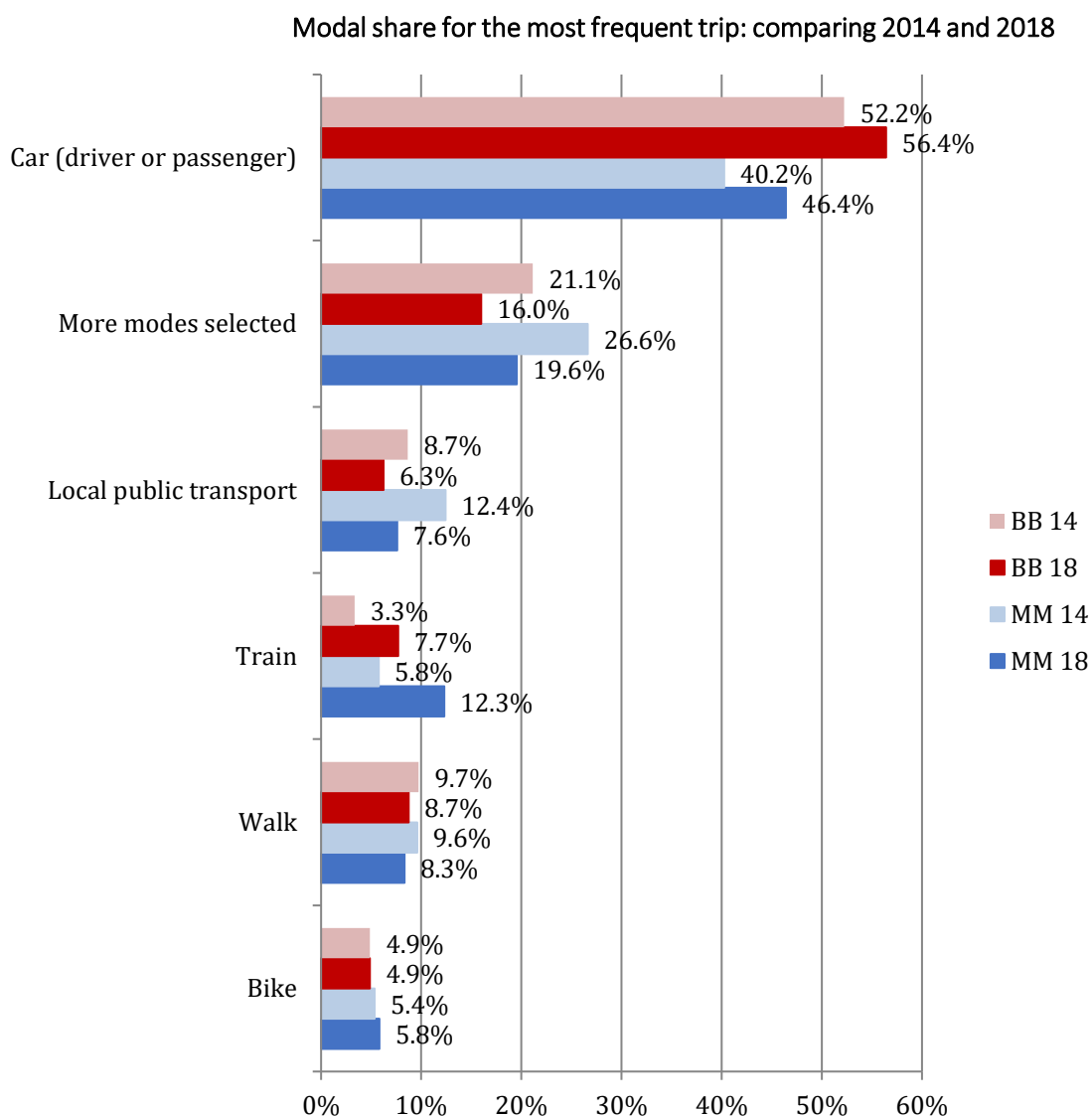Modal share for the most frequent trip: comparing 2014 and 2018

Figure 4.18. Modal share for the most frequent trip: comparing 2014 and 2018. JRC Travel Survey 2014, 2018. Please note: in 2018 edition were added the sharing modes (bike and car), but they has been incorporated respectively in bike and car mode to allow the comparison with 2014.

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[40] Railway passenger transport statistics - quarterly and annual data, 2017. https://ec.europa.eu/eurostat/statistics-explained/index.php/Railway_passenger_transport_statistics_-_quarterly_and_annual_data

Car use rises in all territorial contexts, but it's important to note – as expected – that the share of car users is nearly *double* in rural areas if compared with highly urbanised areas (Figure 4.19), where the overall increase is less pronounced; and where surprisingly, the only ones that didn't increase their car use are the BB (% stable around 38-39%).

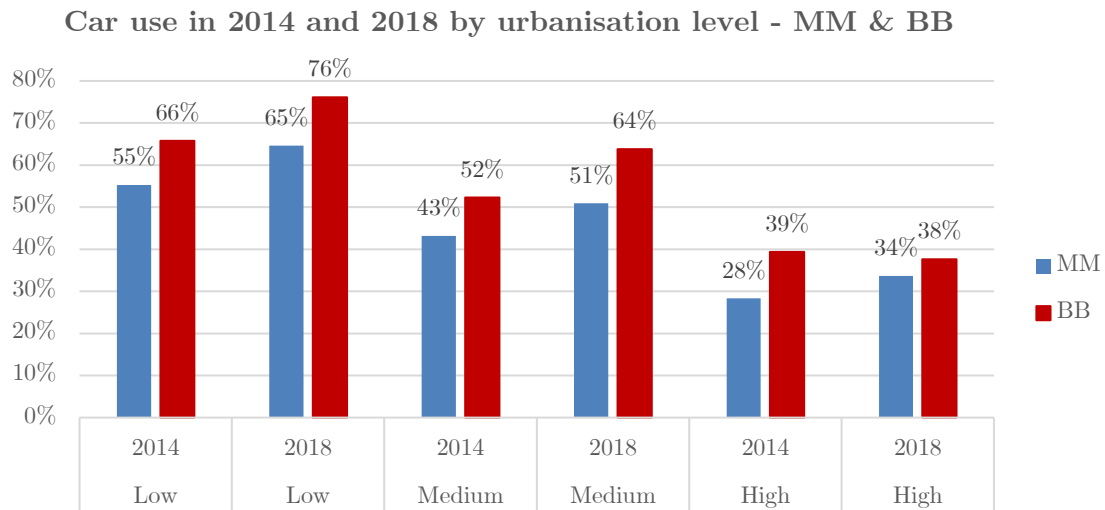**Car use in 2014 and 2018 by urbanisation level - MM & BB**

Figure 4.19. Car use in 2014 and 2018 by urbanisation level - MM & BB. JRC data.

Duration of travel rises for both, while distance remains more or less the same, without any big difference among the two cohorts (Table 4.2). Regarding the frequency of trip (Figure 4.20), both have a decrease in "daily trips", shifting towards trips 2/4 days a week; this is more evident in BB (-15% versus -2.3%), which also shift towards trips once per week or less (moderate increase).

Table 4.2. Duration and distance (JRC Travel Survey 2014, 2018)

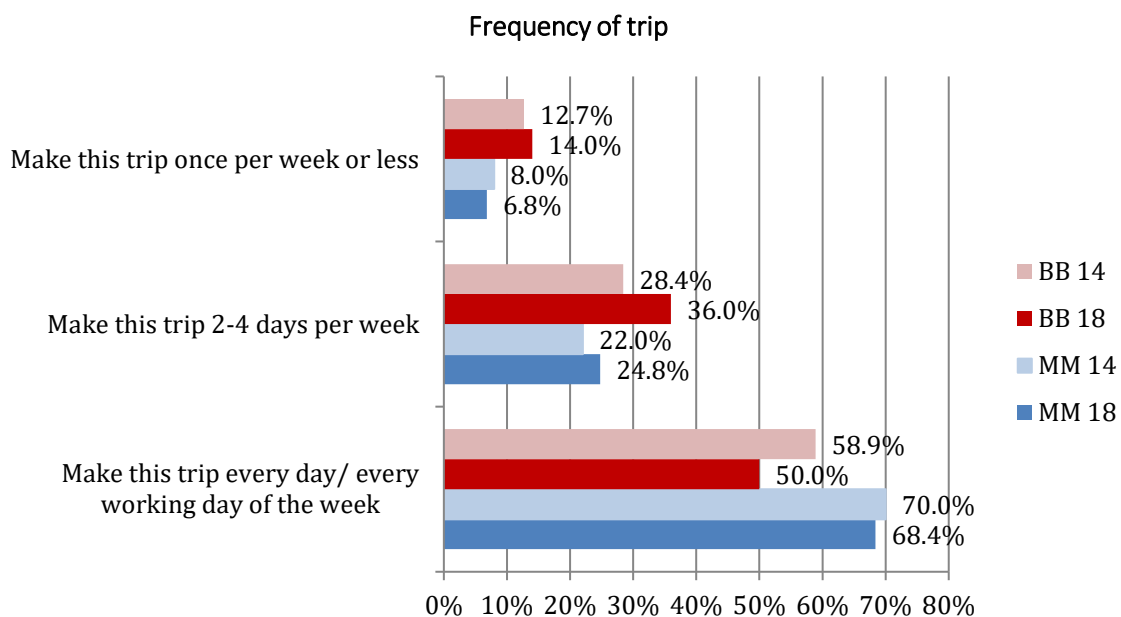|	Mean duration (min)	Mean distance (km)
Millennials 2018	**44.07**	15.90
Millennials 2014	39.55	16.51
Boomers 2018	43.29	16.46
Boomers 2014	39.33	**16.62**

Frequency of trip

Figure 4.20. Frequency of trip (JRC Travel Survey 2014, 2018).

4.2.2 Attitudes towards more sustainable ways of travel 2014-2018

Here they will be investigated attitudes, trends and knowledge about more sustainable ways of travelling (multimodality, vehicle occupancy rates) and alternatives to the traditional private fossil fuel vehicle (car sharing; electric/hybrid vehicles) and a comparison on daily motorised km.

As we have already seen, multimodality for the most frequent trip is more a prerogative of MM (18.1% *versus* 14.6% in 2018, Figure 4.17). But what are the levers that could convince "monomodals" to use a combination of modes (Figure 4.21)? BB are quite rigid about their choice: 44.3% of monomodal BB wouldn't use a combination of modes at *any condition* – versus 29% of MM. For MM, the highest share of answers goes for *time conveniency*, which apparently is valued more than the cost of travel/effort to walk more/flexibility of trip. Still, *time* and then *cost* are largely important factors in mode choice more for MM than BB and would represent good levers to shift towards multimodality: 34% of monomodal MM would consider the shift if travel time is not higher

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(*vs* 22% of BB) and 29% if it's cheaper (*vs* 17.5%, highlighting that is not really a matter of cost for BB).

For monomodals: would you consider to use a combination of modes if available in your area?
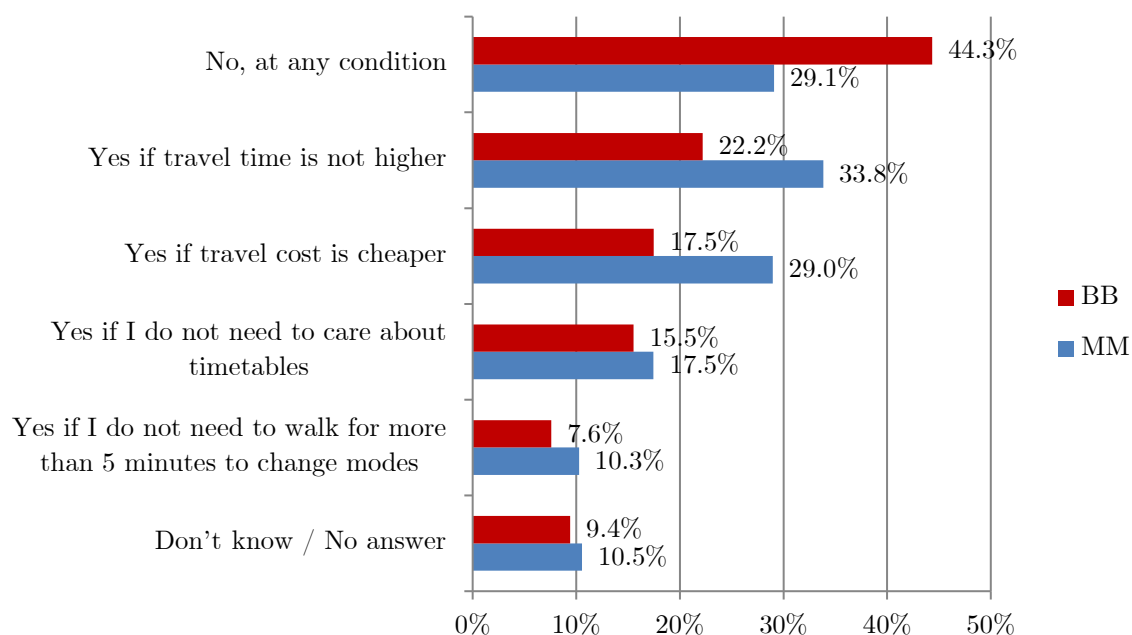

Figure 4.21. Attitudes towards multimodality. JRC Travel Survey 2018.

With regards to vehicle occupancy rates, MM keep having a higher mean then BB – average 1.8 people per car in 2014– but in recent years it diminished at 1.7 (while BB remain stable around 1.5), and their solo-driving largely incremented (from 48% to 57%)(Table 4.3).

Table 4.3. Car occupancy rate (JRC Travel Survey 2014, 2018)

	Mean number of people in the car		% of solo driving	
	2014	**2018**	**2014**	**2018**
Millennials	1.83	1.71	47.9%	57.2%
Baby Boomers	1.57	1.56	56.5%	58.7%

With regard to knowledge and use of alternatives to private fossil fuel vehicles, we can see a substantial rise in the awareness of car sharing system and service (Figure 4.22). BB

appear to be more aware of the existence of the service, but as a matter of fact, the share of actual subscribers is higher among MM, which have also experienced an increase in 2018 (from 3.6% to 7%, while BB stagnated around 2%,Figure 4.23). Finally, we can see a general rise in the propensity to consider EVs/hybrid but there are no big cohort-based differences (Figure 4.24)[41].
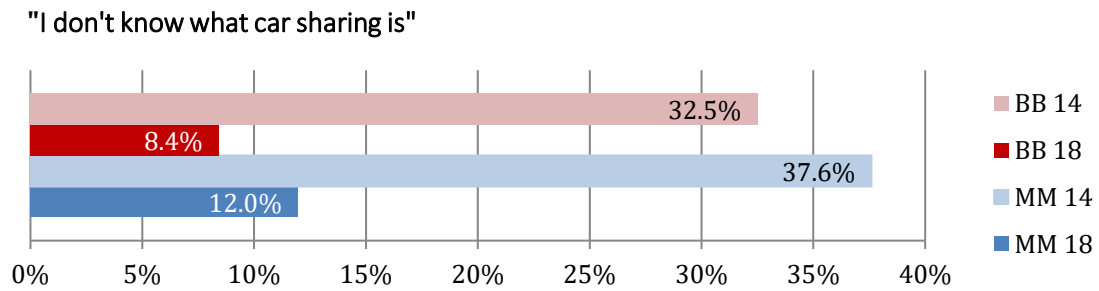
"I don't know what car sharing is"

Figure 4.22. Car sharing - knowing the service. JRC Travel Survey 2014, 2018.
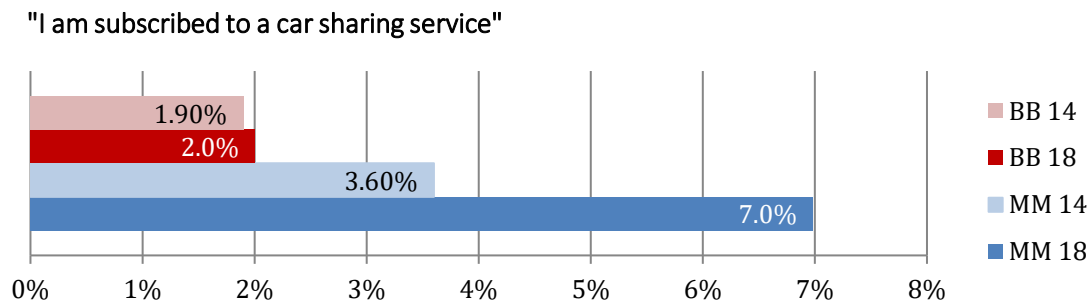
"I am subscribed to a car sharing service"

Figure 4.23. Car sharing - subscription. JRC Travel Survey 2014, 2018.

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[41] Please note that this comparison is only indicative since this information were collected in a different way in 2014 and 2018 as following:

2014 (two separate questions)

1. "Do you know what car sharing services are? - Yes / No / Unsure"

2. "If in your city a car share service was opened would you be interested to subscribe it? - No, I would not be interested in this service / Maybe yes, maybe not. I would need to test the service before taking a decision / Yes without any influence on my car ownership / Yes I'm already client of a car sharing service / Yes and I would give up one car I currently own / Yes, instead of purchasing a new car.

2018 (one question)

"Do you own a car sharing subscription? - Yes / No / I don't know what car sharing is".

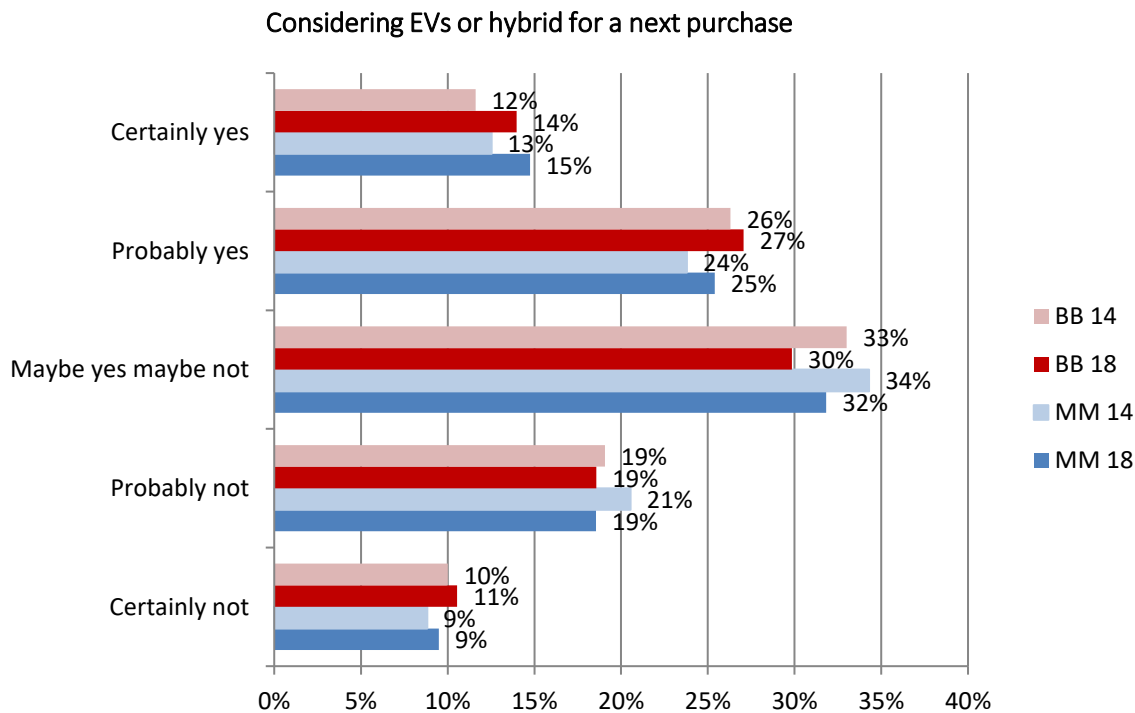## Considering EVs or hybrid for a next purchase

Figure 4.24. Considering EVs or hybrid for a next purchase. JRC Travel Survey 2014, 2018.

To give an idea of the environmental impact of daily travel (amount of km travelled by the most polluting mode), a comparison of the distance travelled with car/motorcycle for the most frequent trip (motorised km) has been implemented (Figure 4.25). Among MM we can observe a larger share of zero motorised km which persist in 2018 (always around +11/12 percentage points more than BB), but with a decline of -11%, shifting in motorised km (especially in the classes of 3-5 km and 6-10 km). Other distance classes show lower or no rise. Nonetheless, this means that among MM, in recent years, motorised trip captured short distance trips that can be in most cases covered by bike. We see a similar fall in BB too, even bigger (-16.8% of zero motorised km), and they still remain the ones with a higher share for the higher distance classes, even considering the larger share of retired people in 2018 and the insurgence of physical limitations (cfr. par. 4.1.1), showing a particular resistance in their habits, on the contrary on what said by Bailey (2004, cfr. par. 2.1) about the decline in travel activity linked to a reduced willingness and/or ability to drive especially after retirement. Either for them, the two distance classes in which we see the highest rise is 3-5 km and 6-10 km.

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Motorised km of most frequent trip 2014-2018
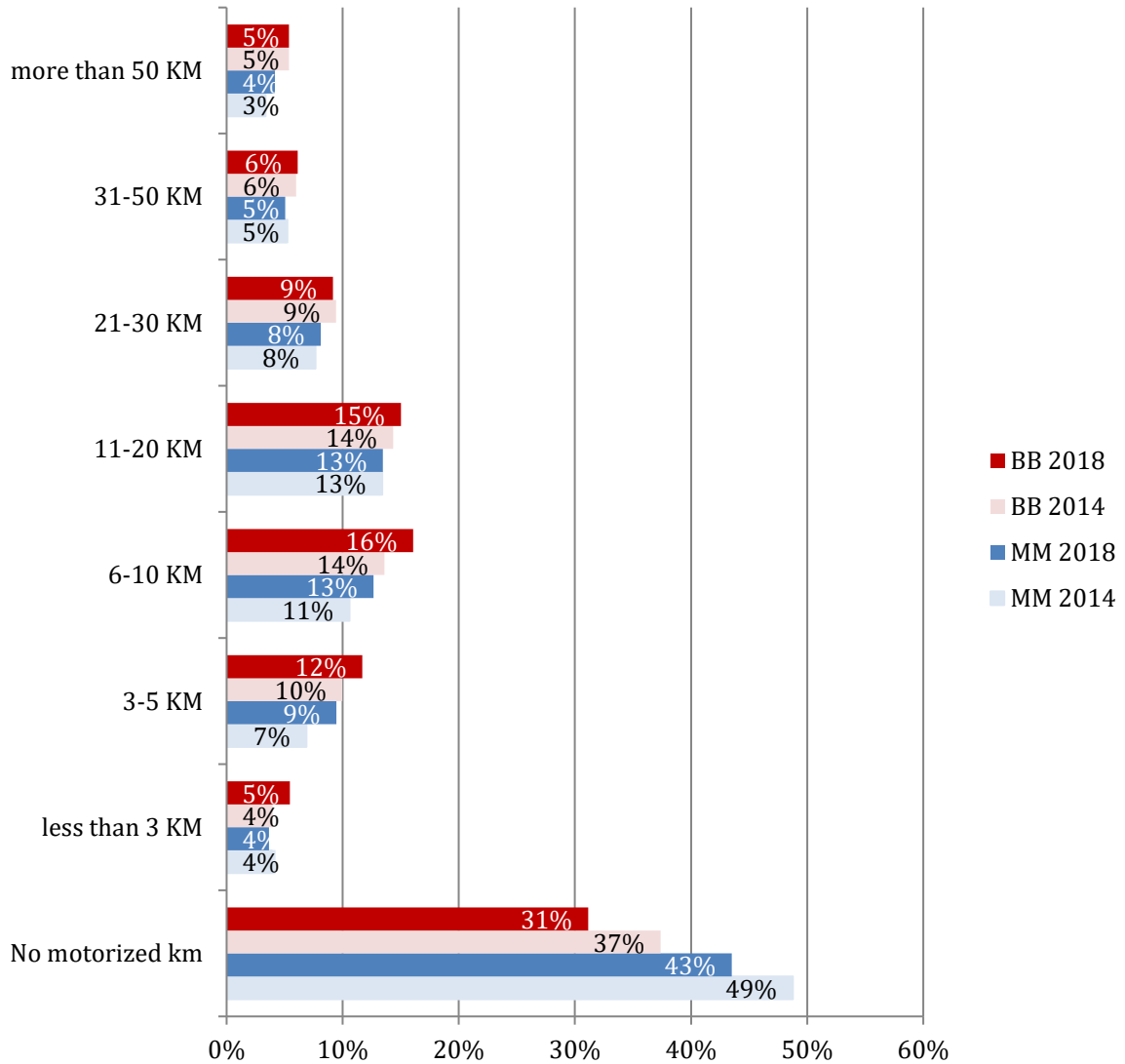
Figure 4.25. Motorised km of most frequent trip 2014-2018. JRC Travel Survey 2014, 2018.

4.2.3 Car mobility capital

As a conclusion to this paragraph, an analysis of the (car) mobility capital of cohorts has been implemented. The reference to the concept of mobility capital (Kaufmann, Bergman, & Joye, 2014) is only partial, since here – due to the available data – we only observe the subjective and household resources available for auto-mobility, observing trends on car availability and future buying plans and licensing. At first, we can see thanks to EU-

SILC data a time series of car availability in households (Figure 4.26). It shows a relentless and unequivocal rising trend in car ownership in MM households[42] (61% in 2008 to 78% in 2018) which is already reaching the levels of BB in 2018 (which is stable around 83% since 2008, Figure 4.27). In parallel, we see a constant decline in the people who do not have a car because of unaffordability (from 22% to 10%) which became over years a secondary reason to not own a car if compared with those not linked with monetary causes, which represent a niche group (12% in 2018).

Does your household have a car/van for private use? - MM time series 2008-2018
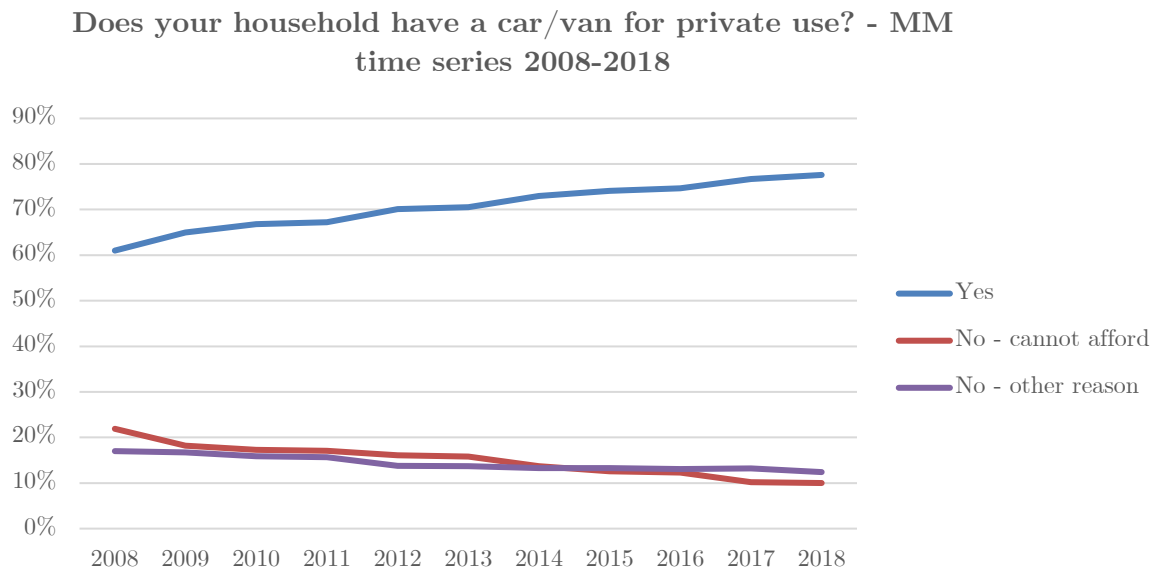

Figure 4.26. "Does your household have a car/van for private use?" - for Millennials not living with parents 2008-2018 (EU SILC)[43].

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[42] Only MM living outside the parental house has been considered for this analysis.

[43] Crosstab selecting gen=MM AND Living with the parents = 0, with the Year of the Survey in the columns. Syntax *(gen = 2 AND PB195_ V3 = 0)*

Does your household have a car/van for private use? - MM & BB, 2018
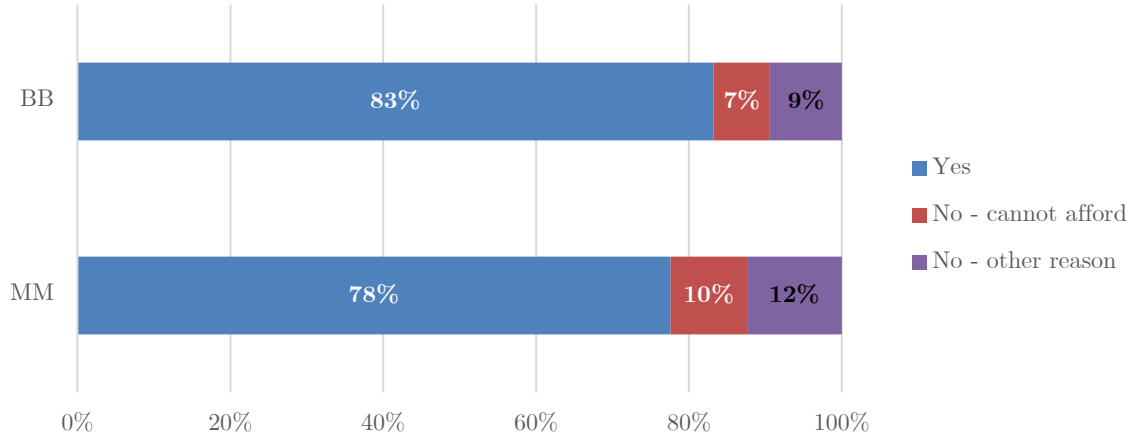
Figure 4.27. Does your household have a car/van for private use? - MM & BB, 2018. EU-SILC.

Apparently, MM still desire cars: 51.6% have plans to buy it in the short term (BB 39.7%), a difference that is understandable considering that in most cases for MM it would represent the first car (Figure 4.28). Also the number of available vehicles per capita (given by the number of cars / number of adults in the household) confirm what described by EU-SILC data, showing that MM are experiencing an increase, reaching the level of BB (which remain stable around 0.68 vehicles per capita, Table 4.4).

Plan to purchase a vehicle (2018)

Figure 4.28. Plan to purchase a vehicle (2018). JRC data 2018.

Table 4.4. Available vehicles per capita. JRC data 2014, 2018

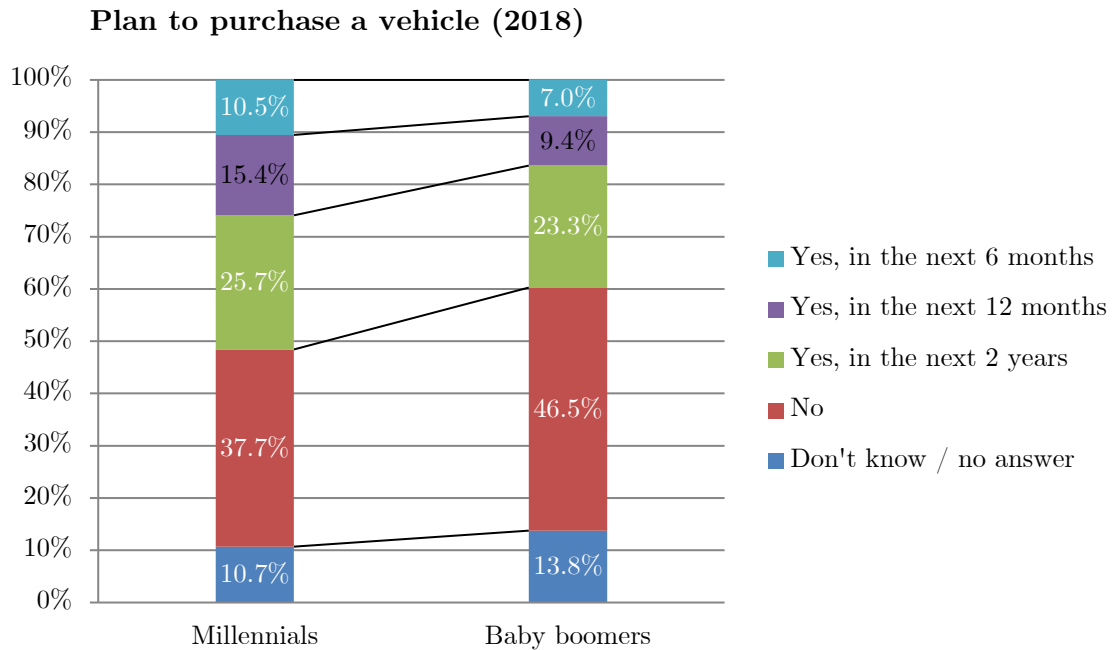| Millennials 2018	0.68
Millennials 2014	0.57
Boomers 2018	0.67
Boomers 2014	0.65

Licensing rates keep rising for both cohorts (Figure 4.29), confirming the increase in licensing trends even among the older population found also by Hjorthol et al. (2004) in the recent decades. It has also to be considered that in 2018 a 5% of MM do not have a driving license but it's applying for one, easily compensating the share of non-licensed in the near future reaching BB level, Figure 4.30. Furthermore, if we look at the motivations underlying the fact of not owning a license (Figure 4.31), we see that 40% of non-licensed MM has not one because they *cannot afford* it (more selected option among MM). This highlights the economic influence on the decline in getting a license, even if data are also telling that there is a majority who do not have one for *other reasons* (not interested/prefer other modes/feel uncomfortable/no need to drive/health reasons...). On the other hand,

among non-licensed BB the most selected reason is *"I'm not interested in having a driving licence/ I prefer to use another mode of transport"*. This means that there are less non-licensed people in the BB cohort, but in their case it seems less connected with economic reasons.

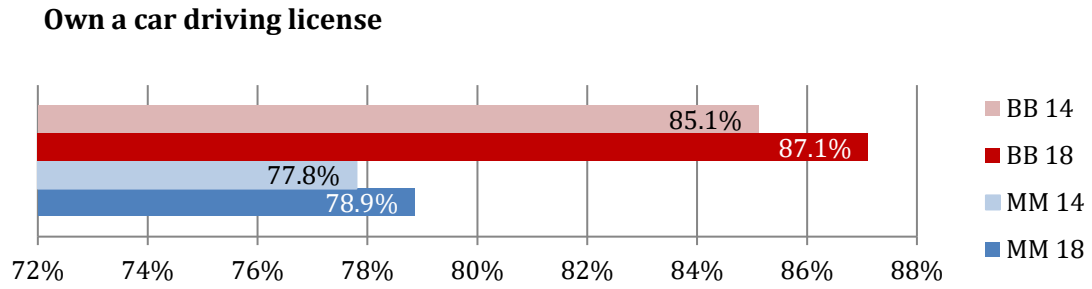**Own a car driving license**

Figure 4.29. Own a car driving license. Note: considering only Millennials aged 18+ for 2014. JRC data, 2014, 2018.

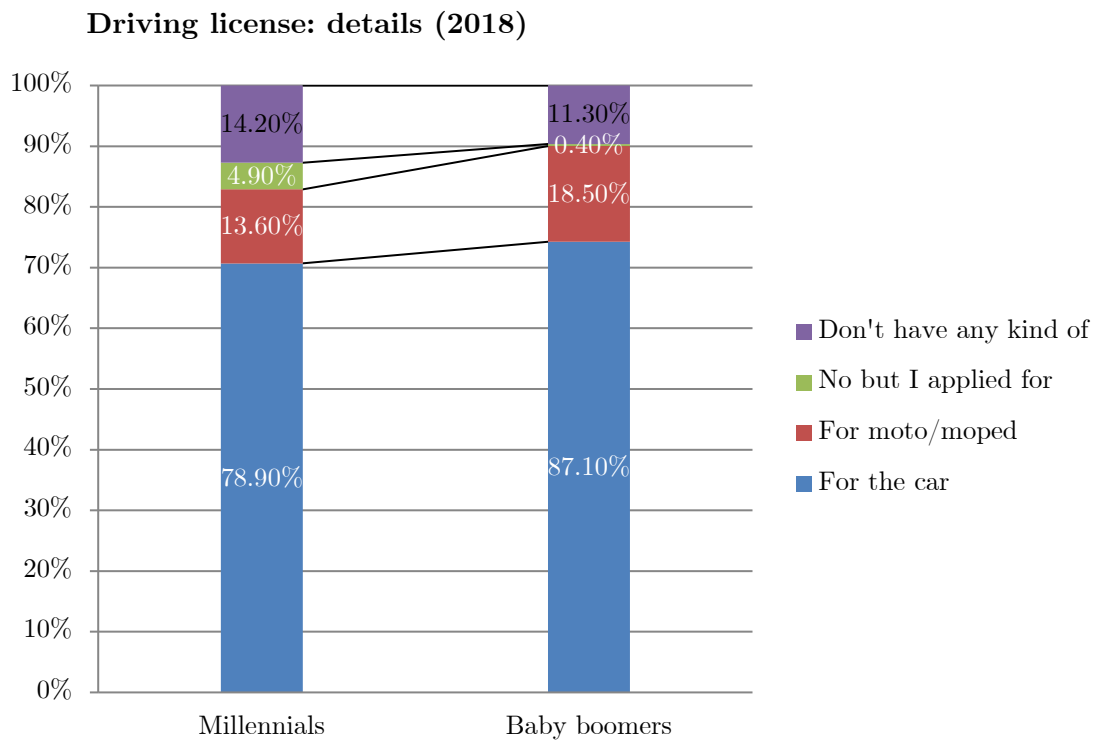**Driving license: details (2018)**

Figure 4.30. Driving license: details (2018). JRC data 2018.

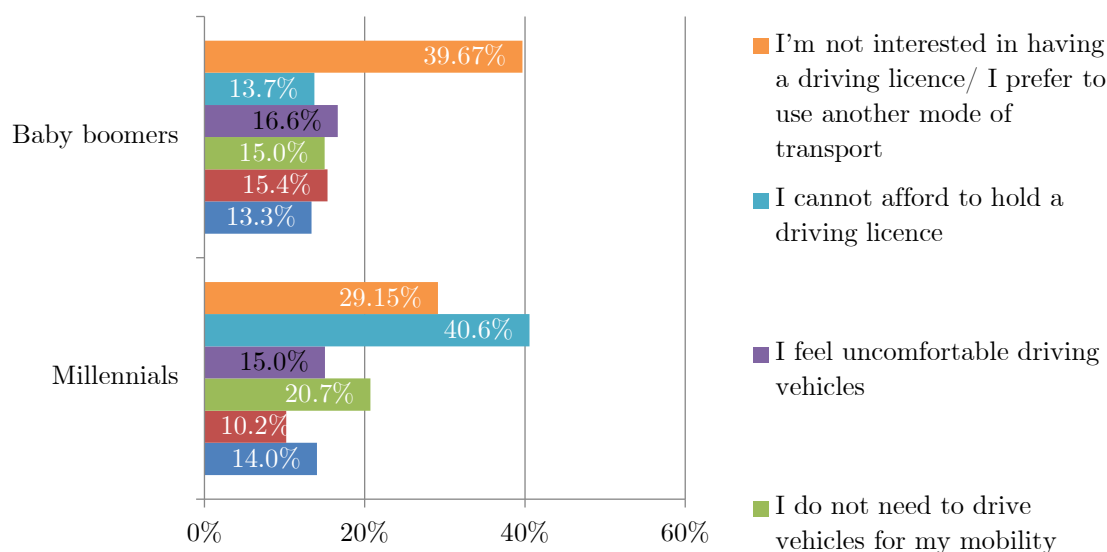**Non licensed people: underlying motivations (2018)**

Figure 4.31. Non licensed people: underlying motivations (2018). JRC data 2018.

4.3 Geographies of behaviour in Europe: a view from above

The results presented above have to deal with huge national and regional differences that affect the European territory – included travel behaviour – based on diversities in cultures, infrastructures, policies, economic contexts. This paragraph will help to remember and understand that behaviours are not to be considered homogeneous in Europe – and not even inside the single countries, as brilliantly exposed and questioned by the paper "The rise and decline of national habitus"(Kuipers, 2013), which challenges static culturalist views of national value orientations and identities – but will be useful to highlight some territorial trends which are particularly pronounced and may explain and have great influence on the individual behaviour.

For this reason, in this section the analysis will follow the aggregation of countries proposed by Focas & Christidis (2017), which discerned clusters of EU countries that have similar economic, political and cultural histories with similar trends on driving rates in the last decades:

- Countries facing the economic crisis (PIIGS): Portugal, Ireland, Italy, Greece, Spain. They suffered more from the recent economic crisis, and had seen car use

grew up to the turn of the century, then plateaued, and then plummet after 2008/9 with the outbreak of economic crisis.

- Western countries that peaked[44]: Sweden, United Kingdom, Netherlands, Luxembourg. These are part of the Western countries that witnessed a peak and fall in car use rates.

- Western countries with stable growth: France, Austria, Germany, Denmark, Finland, Belgium. They had seen a slow growth in car use but no discernible peak.

- East European countries with sustained growth: Bulgaria, Poland, Romania, Czech Republic, Slovakia, Slovenia, Croatia, Hungary, Estonia, Latvia, Lithuania. They have seen car use rates grow fast, but from a low base.

The graph of passengers car activity in Europe (Figure 4.32) shows the different trends of countries, and confirms the fact that the overall car use grew until 2009, then started decreasing, and in 2013 began to rise again (see the "EU 28" dotted line in red). Unquestionably, a major role is played by the Eastern countries, which are catching up to reach western motorization rates, starting from a lower base. But they are not the only ones with growing rates of car use, as explained in Table 4.5, which sums up the different trends experienced by the clusters.

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[44] Reached a peak in car km per capita at the beginning of the Millennium, as shown in a graph in Focas & Christidis, pag. 537.

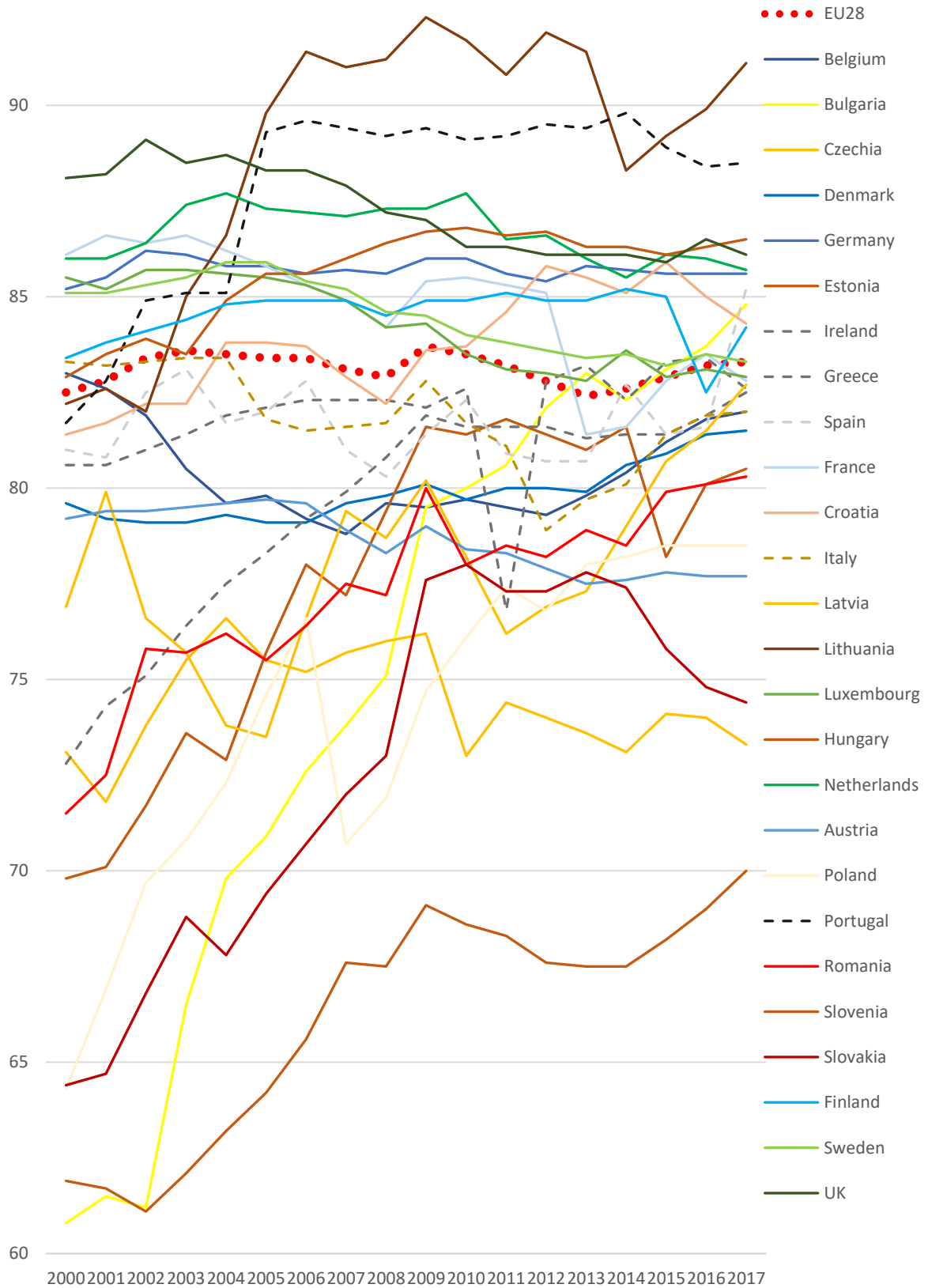% of cars in the modal split of passenger transport in Europe (2000-2017)

Figure 4.32. Percentage of cars in the modal split of passenger transport in Europe (2000-2017). Source: Eurostat Data Explorer. Percentage of transport by passenger cars in total inland passenger transport performance (which includes road – passenger cars, buses and coaches – and rail transport). Last update 09/09/2019, extracted on 16/01/2020. Clusters of countries represented in different colour-groups (as explained inTable 4.5). Full table available in Annex D.

Table 4.5. EU28 clusters and recent trends in car activity

	Car activity trends from **Figure 4.32**	**Average in 2017**	**Pop weight on EU28**[45]
Eastern countries with sustained growth *(red/yellow)*	They are still in the process of catching up car activity – some countries with persistent pace (Bulgaria, Poland) – with the exception of Croatia, Czech Republic and Slovakia. Lithuania has the highest share in EU28, reaching a 91% in 2006 and remaining high ever since)	80.6%	20%
PIIGS *(grey + dashed line)*	After the decline which followed the economic crisis, they are now – in the last 5 years – mostly back on their steps – someone moderately (Portugal is almost stable around 89%), others more intensively (Italy, on its way to reach its 83% of 2008)	84.2%	26%
Western countries with stable economies *(blue)*	Germany and Austria are remaining stable around their percentages (Austria is the lowest with its 77%); also Finland, after a brief fall in 2016. Denmark, Belgium and France are all visibly rising again.	82%	35%
Peaked countries *(green)*	They confirmed their peak, remaining more or less stable around their percentages, which by the way are on average the highest (84.5%) – and not experiencing a further fall.	84.5%	18%

If represented on a map, the results on car use and driving license rates coming from the 2018 JRC Travel Survey confirm the emergence of the clusters proposed by Focas &

Christidis (Figure 4.33). Indeed, it is possible to see in green lower car use as main mode (Figure 4.33, left) in Northern Europe (Scandinavian countries, part of Baltic and Denmark plus Netherlands) and Eastern Europe (particularly low: Hungary), and the lowest percentages of licensed people (Figure 4.33, right) in Eastern and Baltic countries (still in green).
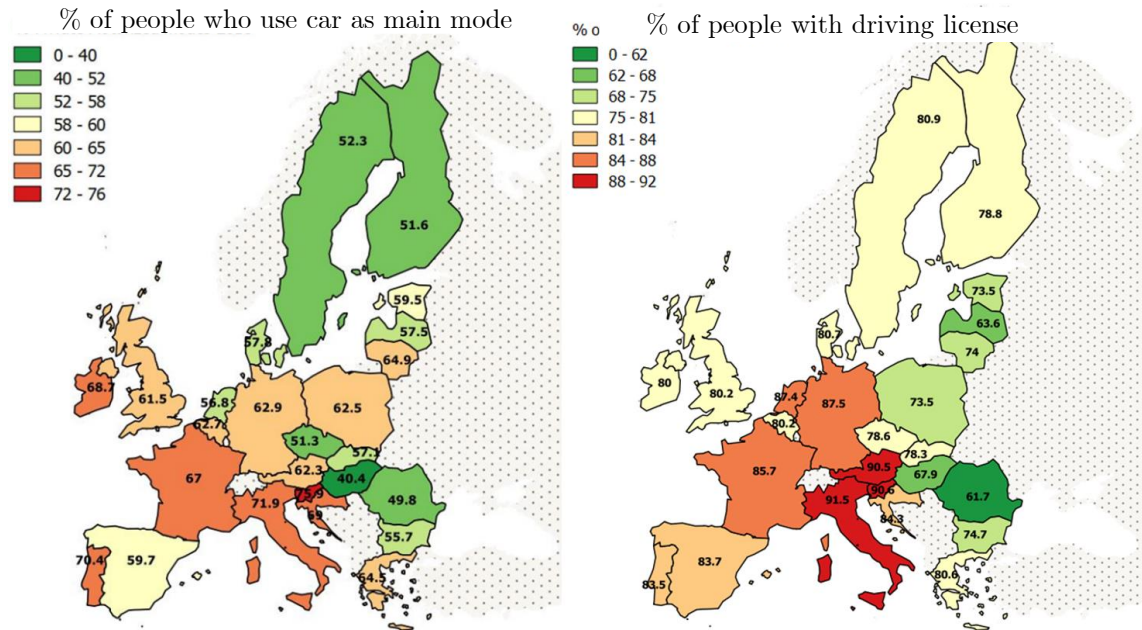
Figure 4.33. Travel Survey 2018 – Car Use on a map. Source: spatial representation of Travel Survey 2018 data (% of people that indicated car/motorcycle as preferred mode in most frequent trip; people with a driving license) with QGIS, own elaboration. Data weighted by Country Weight. Categorization of colours created by "Natural Breaks" function of QGIS[46].

At the same time, as best alternatives to car: public transport use (Figure 4.34, left) is more spread in Eastern and Scandinavian countries (especially Czech Republic, Slovakia, Hungary, in green), while slow modes (Figure 4.34, right) do not follow a homogeneous distribution, with a peak in the commonly recognised *cycling country* of Netherlands (in green).

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[46] This algorithm tries to find natural groupings of data to create classes. The resulting classes will be such that there will be maximum variance between individual classes and least variance within each class.

% of people who use public transport as main mode

13 - 15
15 - 18
18 - 23
23 - 26
26 - 32
32 - 38

% of people who walk/cycle as main mode

- 8
8 - 10
10 - 13
13 - 16
16 - 19
19 - 22
22 - 27
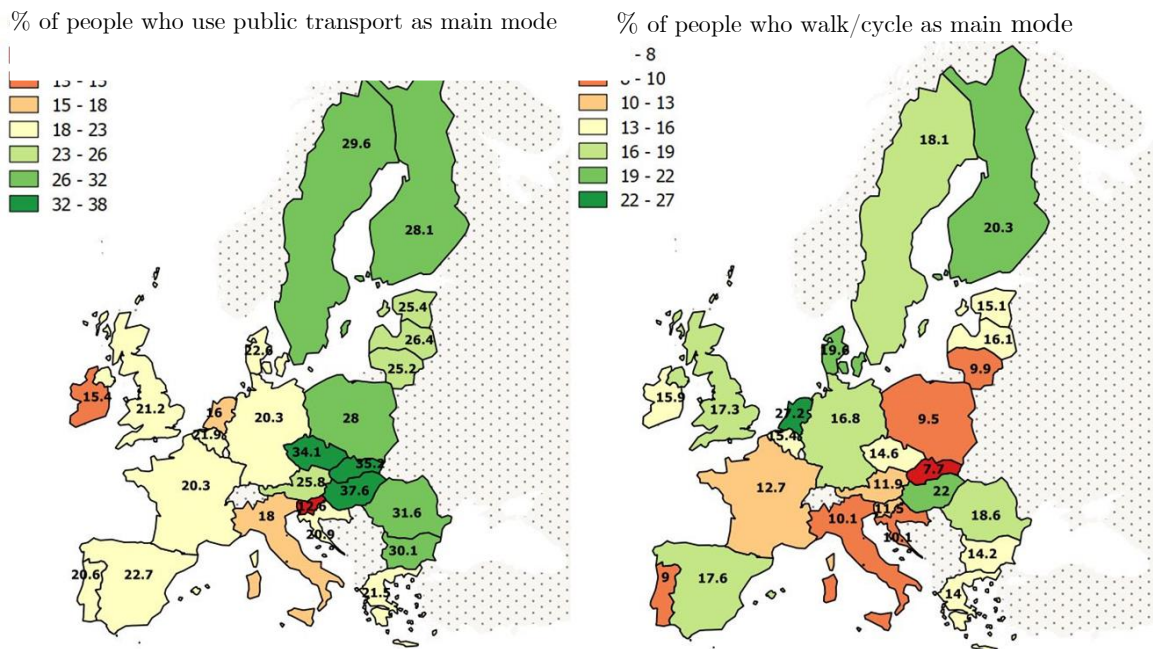
Figure 4.34. Travel Survey 2018 – Alternatives to car on a map. Source: same as Figure 4.33.

With this background, it is now possible to focus on MMs' behaviour aggregated by country clusters, to see how the results presented above are affected by territorial differences (sample composition in Table 4.6).

Table 4.6. Sample - n° of Millennials per cluster in the JRC datasets

	Dataset 2014	Dataset 2018
Eastern countries with sustained growth	3485	4082
Countries hit by the economic crisis	1316	1410
Western countries with stable growth	1835	2203
Peaked countries	1133	1274
Total	7769	8969

With Figure 4.35 we can clearly see that car use has grown in every cluster, indeed with different intensities: Eastern countries with a robust increase (+6 percentage points) and consequent loss in slow modes and public transport. Peaked countries actually behave as peaked countries, with similar patterns as the Western cluster: lower shares in car use

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(around 50%), stable public transport (around 30%). This may suggest that regardless of the economic crisis their mobility behaviour is more or less stable, while the other clusters are more susceptible to economic changes, showing more elasticity (Eastern countries reaching the Western levels – also in licensing, while PIIGS quickly increasing their car use, as they have to "regain" pre-crisis levels). Even considering the presence of conditions strictly connected with lower car use (low income, unemployment, high urbanization) the MM living in PIIGS countries still appear to be attached to car culture, with the highest modal share for cars and an increase in last years almost at the level of Eastern countries (Figure 4.35).

It is evident in this case the role of territorial context/culture in influencing mobility habits, also visible in the much smaller share of young people living alone if compared with Western/Peaked clusters, which is in this case a condition correlated with less car use (Table 4.7). Considering these last two clusters, they show very similar patterns in modal share and trends in the last four years, even if in Peaked we can see a larger loss in slow modes in favour of car (Figure 4.35).

Table 4.7. Millennials' living context / conditions per each cluster. JRC data 2018.

	Eastern countries with sustained growth	Countries hit by the economic crisis	Western countries with stable growth	Peaked countries
Living in areas with >250k inhab.	39.5%	44.5%	35.4%	37.0%
Living in single adult household	7.8%	9.7%	23.0%	18.6%
Student	17.5%	14.4%	20.6%	15.6%
Not employed	11.7%	15.0%	11.4%	7.4%
Low income group	23.1%	37.4%	31.4%	26.2%

Differences in Millennials' modal share 2014-2018 in EU country clusters
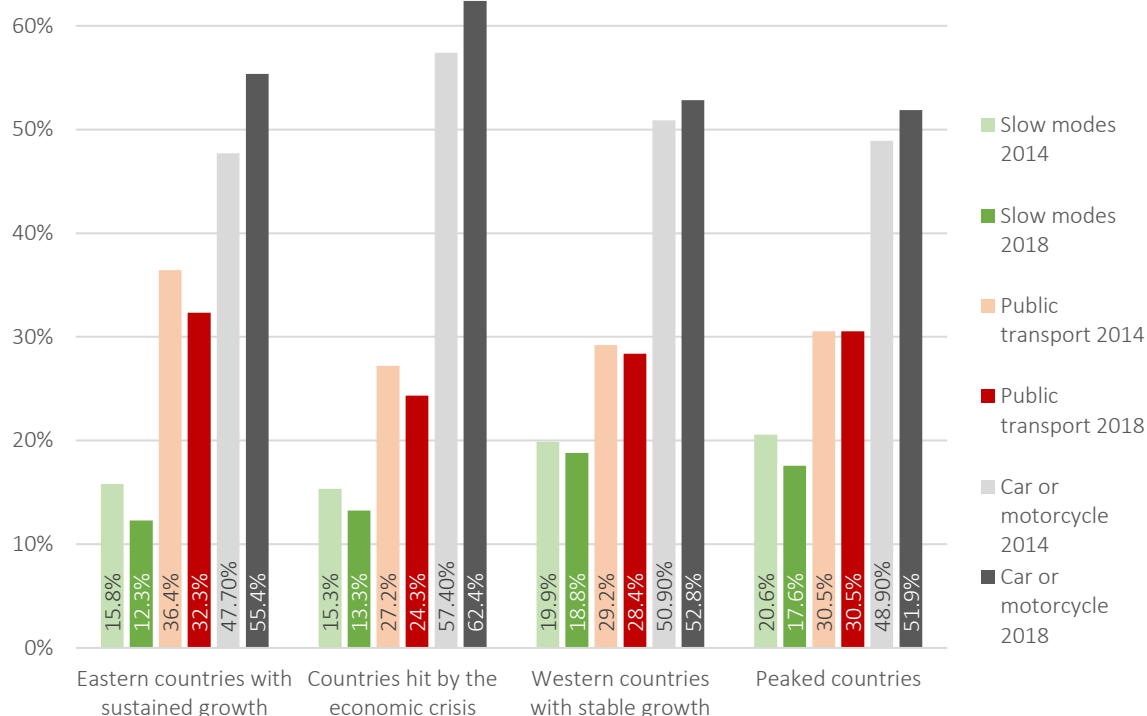
Figure 4.35. Differences in Millennials' modal share 2014-2018 in EU country clusters. JRC data 2014, 2018.

As a matter of fact, also vehicles pro capita are increasing in all clusters (around +16%, still with the highest pace in Eastern countries with +20% - Table 4.8). One could think that an increase it's normal since we are looking at young people which are probably dealing with their first car, but also looking at the general population the percentage variations remain similar, even if the Western cluster has the lowest rise in general (+11%), but the youngsters follow the same rising trend of other clusters.

The vehicle purchase intentions confirm what said above, with larger shares of MM without intention to buy in Peaked and Western countries – even if the high levels of car ownership in Western (0.73 vehicles per capita, highest among clusters) suggest that they may have already bought the first car. Furthermore, interesting results are coming from i) car sharing, which sees the highest share of subscribers in PIIGS, that may be interpreted as a sign of car attachment (the possibility to ride a car without owning it); and ii) solo

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driving, which decreases only in Western cluster, and have a dramatic increase in Eastern (from 29.5% to 40.6%), while shows the highest levels in Western and Peaked, around 60% (showing some apparent correlation with economic context and fluctuations: is people sharing rides only when forced by economic constraints?).

Finally, thinking about the reasons of not-owning a driving license (Figure 4.36), it's more evident in PIIGS countries a higher presence of the issue of non-affordability, for almost half of MM (which by the way remains the first reason in every cluster), that may suggest that with a recovery of favourable economic conditions, a large part of them will probably get the license. Western and Peaked are leading the "I prefer to use another mode" reason (34%), while for Eastern countries the reasons are more equally distributed, with the largest share of "I do not need to drive for my mobility needs" among clusters (24%).

Table 4.8. Millennials' attitudes towards car in EU country clusters. JRC data 2014, 2018.

	Eastern countries with sustained growth	Countries hit by the economic crisis	Western countries with stable growth	Peaked countries
Have a car sharing subscription				
2014	1.5%	2.3%	4.4%	1.7%
2018	4.2%	9.1%	7.9%	6.8%
Solo driving				
2014	29.5%	44.9%	61.9%	57.8%
2018	40.6%	49.4%	60.5%	64.7%
Vehicles per capita				
2014	0.48	0.61	0.62	0.57
2018	0.60	0.72	0.73	0.69
% variation	20.7	15.5	15.6	18.4
% variation (total pop.)	19.6	16.4	11.0	16.5
Have a driving license	76.1%	80.9%	79.0%	78.2%
No plans to buy a car in the next 2 years (2018)	34.9%	30.8%	40.4%	45.7%

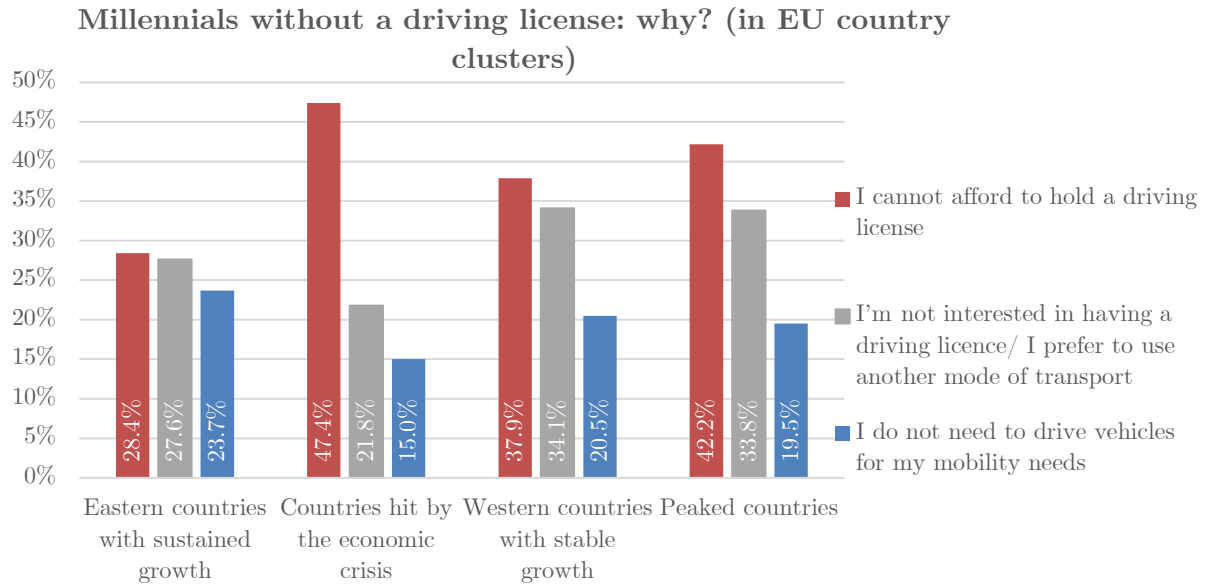**Millennials without a driving license: why? (in EU country clusters)**

Figure 4.36. Millennials without a driving license: why? (in EU country clusters). JRC data 2014, 2018.

4.4 Car use: is there a cohort effect? Exploring the impact of key variables

Wrapping up in a few words all the steps that brought us here: what we got is that Millennials as a cohort seem to have less polluting travel habits than Baby Boomers, for example with a lower use of car as a main mode and a more diffused tendency to live in highly urbanised areas, while Baby Boomers are maintaining carbon intensive habits with low attitude to change – even considering their life context changes (retirement, reduction in household members). But observing the variations in recent years, it is possible to see that a change of direction is occurring in Millennials' car use decline (relentless rise in car availability) and good habits (e.g. multimodality, higher car occupancy rates) and degree of urbanisation, probably due to their progression in life milestones (job; creation of a family) and improving economic situation; and a substantial contribution in car use rise is coming from Eastern and PIIGS countries (the first catching up with western levels, the second persistent in their car attachment, which apparently declines only during economic downturns), which together make nearly half of the EU28 population (46%, Table 4.5), meaning an overall high impact especially in environmental terms.

As a final step, this chapter ends joining all the different points of view (individual, territorial, cohort-based) and the information gathered above inserting them in a unique model of analysis. According with the descriptive results, some trends are confirmed, but the relative contribution of the "cohort effect" still needs to be analysed net of other confounding effects such as income, occupation, location of residence etc. That's why a multiple logistic regression model has been chosen (implemented on the JRC 2018 dataset, where all the Millennial population were at the driving age; syntax and procedure available in Annex A) to understand the relative contribution of each predictor (independent variables) in determining the probability of choosing car as the main mode for their most frequent trip.

The model (Table 4.9) included i) the main key socio-demographic characteristics, ii) urbanization level and iii) belonging to a certain EU28 cluster. For each variable it is indicated the reference component, and in red the one which is correlated with the highest probability of car use within the group. B indicates the marginal effect on the probability (and also if positive or negative) and Exp(B) the odd ratio between the specific component of the variable and the reference one[47]. Last column indicates significance (a result <0.005 – in green – is considered significant)[48]. VIF values (variance inflation factor[49]) are all included in the range between 0 and 2, excluding the presence of multicollinearity (Table 4.10), namely the possibility that the independent variables in the model present linear relationships, reducing their statistical significance (interfering with the variance in the dependent variable).

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[47] The odd ratio is the constant effect of a predictor X on the likelihood that one outcome Y (in this case car choice as main mode) will occur. E.g. if you are a student, you have Exp(B) possibilities to choose car if compared to being a worker – reference category). An odds ratio (ExpB) of 1 indicates that the condition or event under study is equally likely to occur in both groups. An odds ratio greater than 1 indicates that the condition or event is more likely to occur in the first group. And an odds ratio less than 1 indicates that the condition or event is less likely to occur in the first group.

[48] Statistical significance means that the results in the data are not explainable by chance alone, and it is determined through the statistical hypothesis testing. This test (which is automatically done by SPSS during the analysis) provides a p-value, which is the probability of observing results as extreme as those in the data, assuming the results are truly due to chance alone. A p-value of 5% or lower is often considered to be statistically significant.

[49] VIF is the quotient of the variance in a model with multiple terms by the variance of a model with one term alone, and it provides an index that measures how much the variance of an estimated regression coefficient is increased because of collinearity.

Table 4.9. Logistic regression model on the probability of being car user. JRC data 2018.

Car as main mode	Levels	B	Exp(B)	Sig.
Gender	Female (ref)			
	Male	-0.191	.826	0.000
Cohort	Millennials	-0.326	.722	0.000
	Others	-0.114	.893	0.007
	Baby boomers (ref)			
Education level	Primary	-0.233	.792	0.007
	Low secondary	-0.089	.915	0.060
	Upper secondary (ref)			
	Tertiary	0.054	1.056	0.086
Occupation status	Worker (ref)			
	Student	-1.299	.273	0.000
	Not employed	-0.206	.814	0.000
Household type	Single	-0.442	.643	0.000
	Couple (without children)	-0.031	.969	0.409
	Family with >2 mem. (ref)			
Presence of children aged <15 y.o.	Yes	0.225	1.252	0.000
	No (ref)			
Income group	Low	-0.566	.568	0.000
	Middle low	-0.117	.889	0.001
	Middle (ref)			
	Middle high	0.172	1.188	0.000
	High	0.081	1.084	0.422
Urbanisation level	Rural area	0.612	1.844	0.000
	Small-med sized town (ref)			
	Large town	-0.329	.720	0.000
	Metropolitan area	-0.783	.457	0.000
Cluster of EU countries	Eastern countries	-0.157	0.855	0.000
	PIIGs	0.445	1.560	0.000
	Western countries (ref)			
	Peaked countries	-0.200	0.819	0.000
Cases included	23.399			
Nagelkerke Rsq.	0.129			
Global %	67.1%			

*= B/Exp(B) with sig.<0.010 are shown in grey.

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Table 4.10. Collinearity test

	Cohort	Children >15yo	Gender	Education level	HH type	Occupation status	Income group	Urbanization level	Cluster countries
VIF	1.039	1.431	1.009	1.106	1.461	1.075	1.091	1.044	1.058

The model confirms the fact that MM have less probabilities of being car users then BB (with BB having 1.38 times the probability if compared with MM[50]), independently from the socio-economic/life context conditions (occupation, income, household type, location of residence etc). It can also be seen in Table 4.11 the ranking of the factors that have a major role in determining (positively or negatively) the probability of choosing the car as main mode (please note that the coefficient values are highly dependent on the reference category). This highlights in particular two main factors related with less car use: i) lower status (education, income) and ii) a favourable living context (living in high urbanised areas rather than rural or PIIGS countries – which brings the probability 1.56 times higher if compared with the Western cluster, while living in rural areas almost doubles the probability if compared with small-medium sized towns), revealing the contradiction underlining car use. It also confirms the literature reviewed by Witte et al. (2013), with income and presence of children positively related with car use and level of urbanisation, and the number of household components negatively related, and gender itself being not so determinant.

What we have is then that yes, there seems to be a "cohort effect", but it is not so powerful as it is told by the optimistic narratives around Millennials. The choice (or not) of a car as the main mode for the most frequent trip remains strongly linked to other factors, with the particular dominance of the residential location (both urban/rural and regional cultural context), and the "status" (income level; being a student).

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[50] Inverse odd is simply calculated doing 1/Exp(B). So if the odd of MM is 0.722 (probability to be car users if compared with BB), it means that BB have 1/0.722 times of being car used if compared with MM: 1.38.

Table 4.11. Ranking of the prevailing factors which positively (green) and negatively (red) influence the probability to choose car as main mode

		B
1	Occupation: student	-1.299
2	Living area: metropolitan area	-0.783
3	Living area: rural	0.612
4	Income group: low	-0.566
5	Cluster: PIIGS countries	0.445
6	Household type: single	-0.442
7	Living area: large town	-0.329
8	Cohort group: Millennial	-0.326
9	Education level: primary	-0.233
10	Presence of children aged <15 yo	0.225

5 Millennials in Transition?

As anticipated in the methodology chapter, the quantitative analysis helped us the see the big picture, with a "view from above" that allowed to visualise (in graphs, tables and maps) the severity of change, differences and trends in the two generations in Europe. With the qualitative analysis, the aim is to go deeper into the mechanisms behind mobility choice, changes and attitudes; investigate the role of personal experiences and the territorial context in shaping behaviours and imaginaries, in this case of Millennials: "a view from inside".

The Italian territory was chosen as representative of the PIIGS cluster, which remains attached to car culture "despite everything", as said in par. 4.3: *"even considering the presence of conditions strictly connected with lower car use (low income, unemployment, high urbanization) the MM living in PIIGS countries still appear to be attached to car culture, with the highest modal share for cars and an increase in the last years almost at the level of Eastern countries*" (pag. 111).

It is important, however, to keep in mind the peculiarities of the Italian situation, especially with regard to the the younger population and the processes that affect their residential choices and car ownership. First of all, the particularly high average age in which people leave parental house (30 years, when the EU28 average is 26, as showed in Figure 4.14). The late age at which people become independent of their parents is indeed linked to employment rates and entry wages, that are significantly lower than the European average (Micheli, 2008). As we can see in Figure 5.1, Italy has one of the highest youth unemployment rates, almost double than Sweden, and 6 times higher than Germany. In parallel, if we look at people aged 20-24, we can see that in the Netherlands 2 out of 3 are already working, while in Italy this number stops at less than 1 out of 3 (Figure 5.2), with EU28 average of 49.7% (data related to the year 2015, Eurostat Data Explorer). What's more, the median equivalised income of Italians aged 16-24 in 2015 was €14,117 (Eurostat, 2015)[51], which is 37% less than their Austrian neighbours, and 29% less than the German ones.

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[51] Data extracted from Eurostat Data Expolorer. Median equivalised net income (€) selecting age class 16-24 for the year 2015. Full table in Annex D.
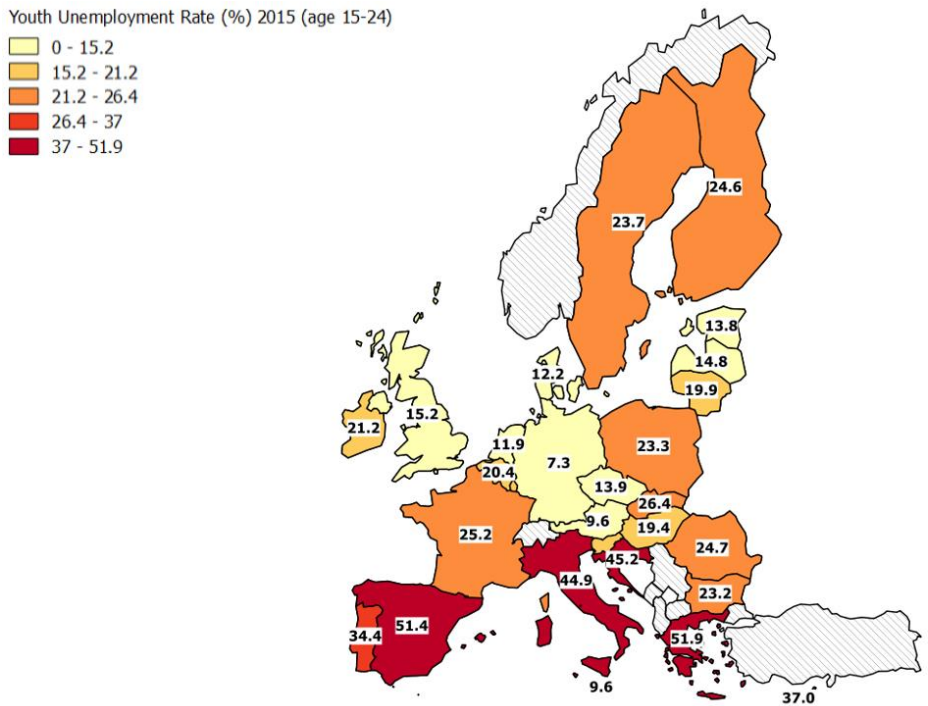
Figure 5.1. QGIS elaboration of Eurostat Data Explorer ("Unemployment rates by sex, age" – 2015, age 15-24).
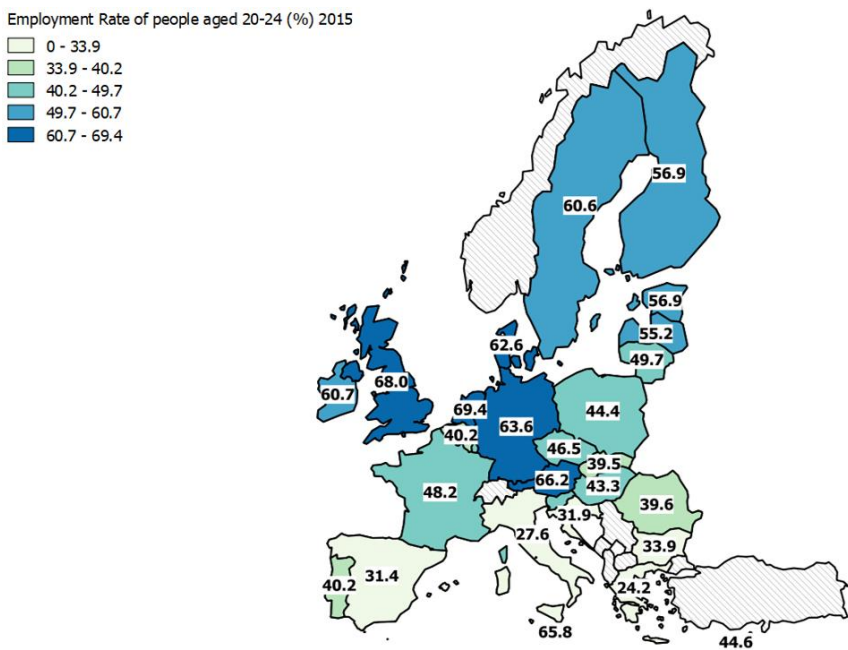

Figure 5.2. QGIS elaboration of Eurostat Data Explorer ("Employment rates by sex, age" – 2015, age 20-24).

These economic factors unquestionably contribute to delay of young Italians to reach independence and leave the parental house. But there is another interesting element that has been noted by the Italian demographer Micheli (2008:5): "*Whether it is because of the slower entry into adult life, or because of the persistent support of the family, one cannot overlook that during the 12 months after leaving home, the young Scandinavian (strictly in his/her twenties) and also the young French or English, experience to a much greater extent the experience of living below the standard poverty threshold; on the contrary, the young Mediterranean who leaves home experiences much more rarely poverty and poor living conditions*". In Italy, it is less common to undertake the risk of economic poverty; the fact of finding a job (even a good job) does not automatically mean to leave home. As also introduced in par. 2.3, Italy is one of those countries in which it persists a precise "sequence" of steps which is generally recognised as the "right one" (ISTAT, 2014), for instance finding a stable job, get married, and *then* leave home. There is also a well-known Italian peculiarity – still following the study of Micheli – which is the diffusion of home ownership. This, together with the robust system of mutual aid within the family which characterises the South European and Mediterranean model, produces the widespread model of "free housing", which favours young Italians to continue to live close to the parental home even after marriage, often to the benefit of both themselves and their parents.

The Italian context is then an intense and utterly interesting ground for fieldwork, to dig with the focus group method into the everyday practices and aforementioned processes of the cohort analysed, with the chance to have a better understanding of their processes of sense-making (Jedlowski & Leccardi, 2003) through which it is possible to recognise the rationale, the narratives and the systems of values and symbols around the main ways of moving.

Although, focusing on the Italian case will also be useful to understand the enormous differences that co-exist in the same national territory, as questioned by the already cited article about "The rise and decline of national habitus" (Kuipers, 2013). The territories involved in this qualitative study, in fact, are very different in terms of population, geography, policies, infrastructures and resources, as introduced briefly in par.

3.3.2. Each one is also characterised by specific strong features – in terms of mobility – which emerged as well along the focus group sessions.

Milan, the economic and financial centre of Italy, is not anymore the car-jammed city it used to be 25 years ago (Legambiente, 2019); it followed a resolute path towards environmental policies – other than a general boost in the public transport system, especially with new underground lines – such as the implementation of "Area C" and "Area B" which are limitations to traffic in the city centre and for most polluting vehicles; experimentations of the so-called "Tactic Urbanism", with the aim to give back space from cars to people, for instance converting car parking areas into coloured car-free public shared spaces with benches, tables and playgrounds, often involving the local actors and community for the design and implementation of the area[52] (Figure 5.3). But at the same time, the differences in these terms between the city centre and the peripheric areas are still evident.

Figure 5.3. Example of Tactic Urbanism in Milan, where once there was a road crossing. Photo by the author.

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[52] An newspaper article about "Tactic Urbanism" which brings some examples from Milan: https://www.ilpost.it/2019/11/09/urbanismo-tattico/

Then we have the capital city of Rome. According to Inrix[53], Rome is the third city in the world for the time lost in traffic (166 hours in 2019, after Bogota and Rio de Janeiro). If – at least until the 2020 pandemic – Milan was gaining day by day a more central position under the spotlight of the national and international press as a role-model city[54], for Rome it happened the exact opposite, with a press that keeps picturing it as a city lost in its infinite "spiral of decadence"[55], in which fundamental services do not work (waste management, public transport). In particular, the transport infrastructure was not able to keep the pace of the enormous urban push of the post-war decades (Figure 5.4) (reinforced by unauthorised building, which precluded any possibility of urban planning and a balanced diffusion of services), generating problems that are worsened by the enormous distances – Rome is the biggest municipality in Italy and one of the biggest in Europe – and by the scarce density of its inhabitants. The vehicle fleet of the public transport company is getting old and it is subjected to malfunctions and damages, and the number or rides have reduced among years, especially in the peripheric areas (*ivi*).

[53] Ranking available at: https://inrix.com/scorecard/

[54] An editorial about Milan on Il Foglio, which went quite viral the past Autumn - 18/11/2019: "Contro Milano" ("Against Milan"). An excerpt: "It is an outburst, a moan, against Milan and its pressing myth of these post-Expo years. Milan the rich, the international, the smart city, Milan even with a good weather!" (own translation). Full article available at:
https://www.ilfoglio.it/societa/2019/11/18/news/contro-milano-287340/

[55] Editorial about Rome on Il Post, 12/02/2020: "Si può salvare Roma?". Available at:
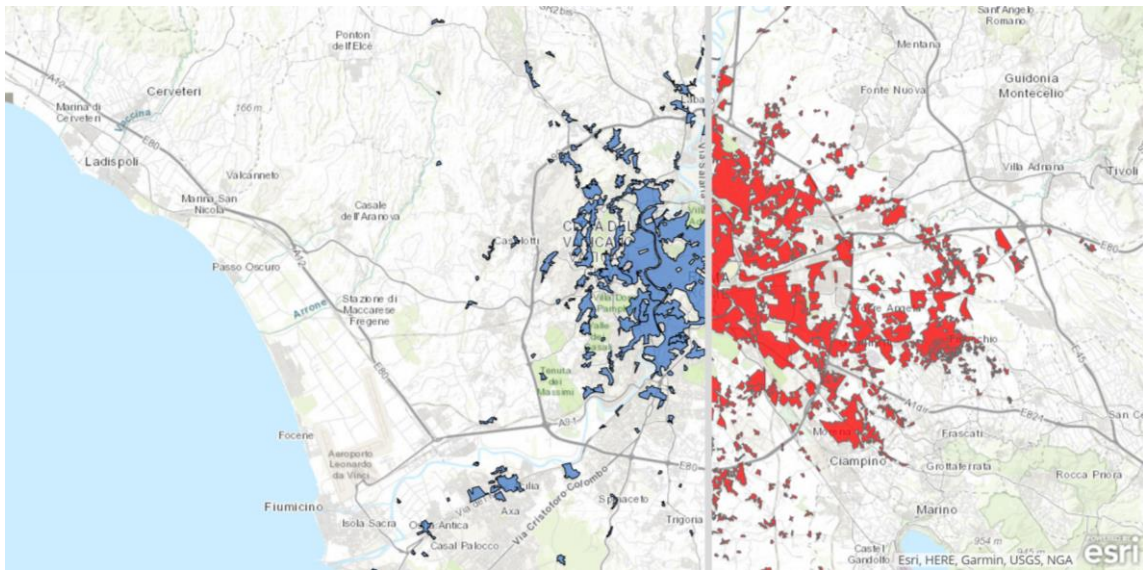https://www.ilpost.it/2020/02/12/salvare-roma-crisi-elezioni/

Figure 5.4. The urban expansion of Rome in the post-war decades. On the left Rome in 1954, on the right Rome in 2002 (urban expansion still happening today). Source ESRI Story Map (interactive version):

https://www.arcgis.com/apps/StorytellingSwipe/index.html?appid=4e6b10329f804c1c8c04a

Again, different situations are represented by the less "metropolitan" cases. Pesaro is gaining public attention and appreciation as "The city of the bicycle", with its by now well-known "bicipolitana", not only because it succeeded in the promotion of a behaviour change in its inhabitants, but also because this structured network of bike lanes – inspired by a classic subway scheme – is now becoming a format which other cities are replicating, taking it as a model (Legambiente, 2019).

Catania as well, despite its infamous record in the number of vehicles per inhabitant (cfr par. 3.3.2), is making progresses in urban environmental policies with its recent initiative – active for over a year now – supporting public transport with the provision of the free seasonal tickets for bus and subway to its 40.000 university students (*ivi*).

Finally, the municipalities surrounding Reggio Emilia, which have been chosen as emblematic of all the little towns (between 8.000-15.000 inhabitants) at the edges of bigger urban areas (Figure 5.5) – "provincia" in italian, areas in which is possible to find the traits of "suburbanism" (i.e. the suburban way of living) even if the history of the diffused Italian urbanization has little to do with the sprawl dynamics of the North American suburbs

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(Lanzani, 2012), as stressed also by De Vidovich (2021) which challenged the adoption of the notion of "suburb" referred to Italy. In particular, the case of the towns at the outskirts of Reggio Emilia is representative of an interesting paradox, since they are close to the very champion cities of cycling behaviour and infrastructures in Italy (Ferrara, Reggio Emilia; with the last one keeping its first position in Italy for the number of km of bike lanes per inhabitant, Legambiente, 2019), in a region which is often associated with a great use of the bike due to its flat and polycentric nature made of historical cities of little-medium dimension, made to measure for cycling. But in the suburban areas the reality is very different from these idyllic cycling oasis: there are towns born and expanded in very recent times (especially during the economic boom with the expansion of the industrial ceramic districts and the so called "motor valley"[56]), structured and built around the car because developed during its very boom, in the post-war decades (Figure 5.6); they are towns where essentially it took place the most stereotypical suburban way of life: bigger and independent houses with green areas where to raise kids, very rare public transport service which is uniquely a prerogative of middle/high school students, driving license once you become of age and then car dependence ever after (Figure 5.7).

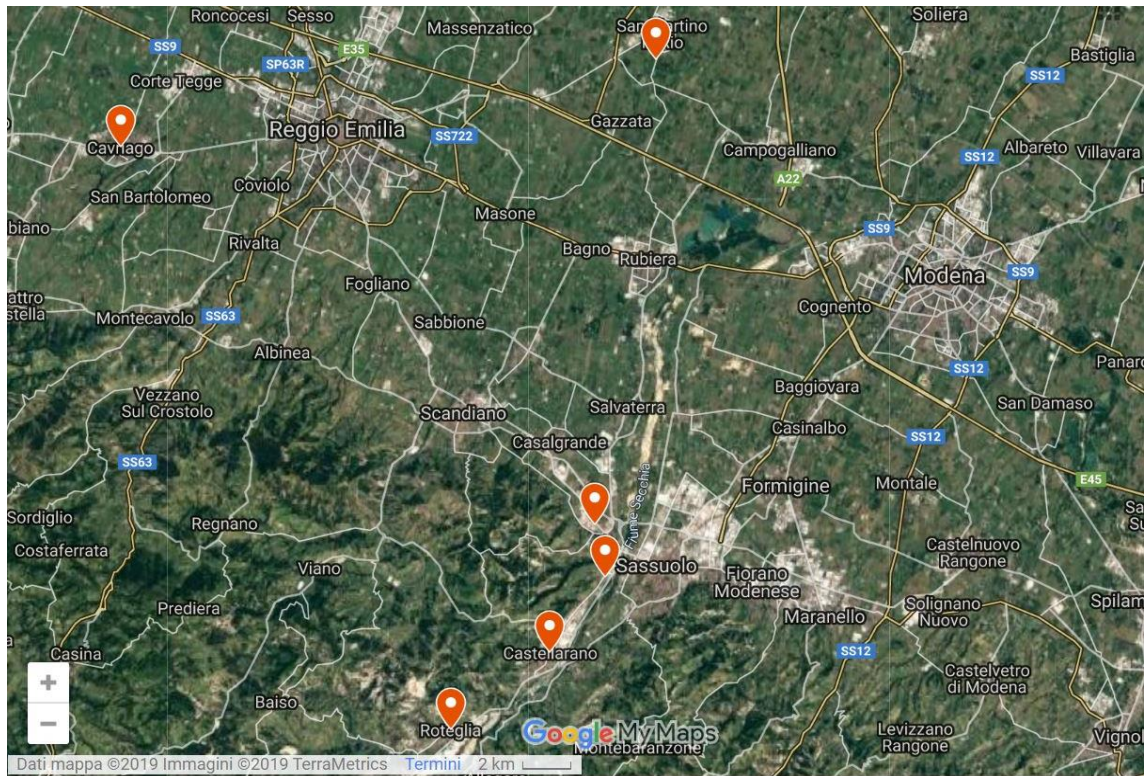[56] For the presence of Ferrari, Maserati, Lamborghini, Ducati factories.

Figure 5.5. A map of the towns of origin of the people interviewed for the Reggio Emilia area. With the satellite view it is possible to delineate the borders of the bigger urban centres (Reggio Emilia; Modena) and the industrial centre of Sassuolo (ceramic district).

Figure 5.6. High presence of cars and under-used marginal bike lanes in one of the little towns of the Reggio Emilia province. Photos by the author.

Figure 5.7. "Suburbia", a view from above. Two different cities in the Province of Reggio Emilia. Above: Castellarano, photo by the author. Below: San Martino in Rio, Google Maps Satellite view, elaborated by the author.

The chapter will fall into three main sections: the exploration of factors related with mode choice, going deep in the role of the location of residence, generational differences and life stages and using the categories of car dependency and mode choice (obligation, opportunity, inclination) as a framework to analyse behaviour, which will be used throughout the chapter (par. 5.1); then a dive into what is the imaginary of Millennials with reference to the modes of transport ("the Millennial Gaze", par. 5.2), with the help of word frequency analysis and word clouds; and finally, some observations on travel behaviour change dynamics (par. 5.3).

Question	Content	Par.
What are the main factors influencing car dependence among Millennials? [CHOICES]	Identification of car (in)dependent places, investigating the role of generational differences (in attitudes, biographies and legacies), the process of *urban diaspora* and its effect on Millennials; and the impact of key life stages and the growing up process	Par. 5.1
What is the imaginary of Millennials behind each mode of transport? [ATTITUDES]	Word frequency analysis to understand the perceptions of Millennials on each mode, identifying positive and negative attributions and key characteristics (of driving, cycling, walking, using public transport, and sharing/e-vehicles)	Par. 5.2
What factors are decisive in travel behaviour change dynamics among Millennials? [CHANGES]	Detection of the dynamics related to behaviour change (good experiences / traumas) and the role of environmental concern	Par. 5.3

5.1 A view from inside: factors affecting modal choice

As a first step, the analysis of the text transcribed has focused on the extrapolation of the role of factors related with car choice emerged in the logistic regression (chapter 4, Table 4.11). The scope was to find further details – after the ones given by the statistical analysis – linked to the everyday life and direct experiences of Millennials: a view from inside, indeed.

The Hierarchy Chart (Figure 5.8) produced by NVivo summarises the various factors mentioned by the people interviewed, and visually shows how much "space" (number

of references) was dedicated to each one in the discussions: we can then see what factors of the regression model emerged spontaneously also in the direct dialogue with Millennials (*residential area, generation, occupation, income, regional cluster, having children, household type, education*) and, in addition, clearly see how the most cited and discussed were 1) *Residential area* (58 references), 2) Belonging to a certain *generation* (50 references) and 3) *Occupation* (32 references).

This paragraph will dive into the analysis of these factors from the point of view of the Millennials interviewed, and subsequently integrate the investigation with the additional factors emerged along the focus groups, also with the help of the categorisations of travel choice (*obligations, opportunities, inclinations*) and car dependence (car dependent *places, people* and *trips*) offered respectively by Stradling & Anable (2008) and Mattioli, Anable, & Vrotsou (2016) (cfr. par. 1.3).

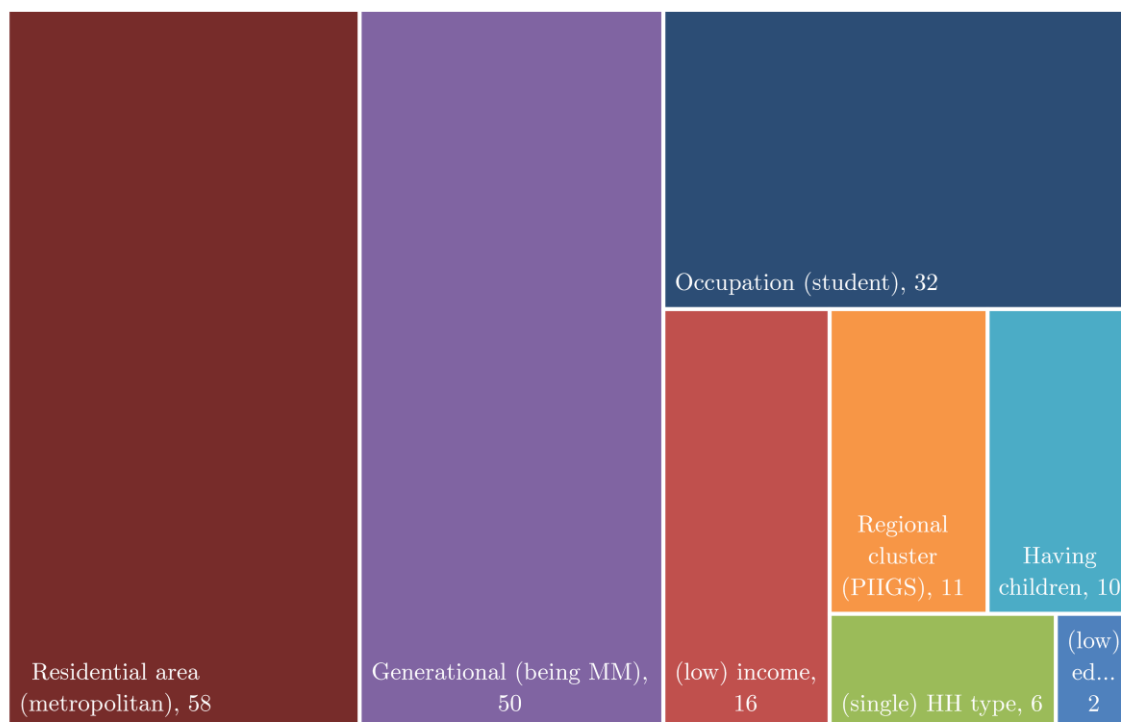## Hierarchy Chart (by n° of nodes referenced)

Figure 5.8. Hierarchy Chart - by n° of nodes referenced. Produced by NVivo software (and elaborated in Excel).

5.1.1 Car (in)dependent places

The obligation to choose the car

As noted above, the real undisputed protagonist of mode choice, as emerged in the regression analysis and confirmed in the focus group sessions, appears to be the *urban dimension*. The context in which you live, especially in the terms of big metropolitan areas/cities, little towns or outskirts, largely determines across the board the choice – more or less obliged – to use the car as the main mode of transport. Speaking of which, considering the three categories of car dependence proposed by Mattioli, Anable, & Vrotsou (2016), the one emerged more frequently among the interviews with Millennials was "car dependent *places*", surely higher than car dependent *people*, and also *trips* (Table 5.1).

Table 5.1. Number of references related to each node regarding car dependence (retrieved by NVivo Crosstab Query)

Car Dependence	*N° ref*
Car dependent places	40
Car dependent trips	34
Car dependent people	20

Going more in detail, Table 5.2 shows how elements regarding car dependent places were mostly discussed by people living in less urbanised areas: for instance, the 86% of people living in small towns – 6 out of 7 – told things related to *car dependent places*, against the 45% of people living in metropolitan cities – 5 out of 11[57].

Table 5.2. Percentage of how many people per each degree of urbanisation are coded under the code of "car dependent places". Retrieved by NVivo Crosstab Query – Column percentage.

	Small town (up to 25.000 inhab.) (7 people)	Small-medium city (25.000-250.000 inhab.) (6 people)	Large city (250.000-1.000.000 inhab.) (11 people)	Metropolitan city (>1.000.000 inhab.) (11 people)	Tot. (35)
Node: *Car dependent places*	86% (6 people)	83% (5 people)	55% (6 people)	45% (5 people)	63%

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[57] This percentages have only the aim to describe and simplify the complexity of the focus group discourse, but they do not have a statistical and/or generalisation purpose.

But then, what were their arguments? Here below a selection of some remarkable references related with *car dependent places*; it is worthy of note to see that all the following citations are made by people living in suburban areas, outskirts or hinterland (of almost all areas analysed), which have in common the "suburban way of life" cited above ("*I live in G****, outside Catania, but I live in the sense that I only sleep there at night, and not even always*" C., CT[58] – typical commuter area[59]), reflecting some similar patterns, such as the fact that they are almost all employed but still living with the parents (see the interviewees' details in Annex E). As it is also worthy of note to see how we are far from a homogeneous "national habitus" (cfr. par. 4.3), and even far from a form of "local" habitus, since even in the same cities/metropolitan areas it is possible to observe huge differences in mobility habits and resources depending on residential location:

- There are people willing to get rid of the car, but unable to move if so (e.g. suburbs in Catania):

  «*I live in a little town, so the link with Catania is a little bit difficult. If there were transport links, which is likely to happen in the future […], I would like to, actually I would be very much inclined, to get rid of the car, totally. But right now I really can't»* (*M., CT, 25 y.o., suburb, employed, living with parents)

- ... Or that would find it impossible (roman outskirts):

  «*If we imagine a life without the car? You mean... With this public transport we got here? Then no, I really could not spare the car. Especially for those who live outside the city centre...»* (*F., RM, 27 y.o., hinterland, employed, living with partner)

  «*For instance, if you live at EUR* [outskirt] *and you have to work to Ciampino* [hinterland] *you must have a car, otherwise it's impossible.»* (R., RM, 27 y.o., outskirts of metropolitan city, employed, living with parents)

- Others that, a stone's throw from their bike friendly cities (outskirts of Pesaro), work in totally car-centred cities:

  «*If I think of F**** [town]*, where I work, none uses the bike, because there is not even... The roads are conceived as spaces for cars. Suffice it to say that*

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[58] All the interviewed people have been anonymised referring to them by random initials followed by the area of the interview: CT stands for Catania area; MI = Milan area; PE = Pesaro area; RE = Reggio Emilia area; RM = Rome area. Sometimes I have added details which I found important for the analysis (age, residential location, etc.). The complete list of interviewed people with their corresponding basic info is in Annex E.

[59] "Quartiere dormitorio", as a typical Italian way to describe it: "dormitory suburb".

they don't even think of the pedestrian crossings!» (M., PE, 34 y.o., outskirts of medium city, employed, living with parents)

- Who got three cars in a family of four and still, often is not enough (suburbs of Reggio Emilia), speaking about how they cannot "allow themselves"[60] to go by bike or by foot because commuting distances and roads – again – are only conceived for cars:
  «I mean here it is limiting also to not have a car at your disposal all the time. If you have to share it, if only with another person, it could be a problem. During the day, especially [...] I can see it in my case: we are in 4 with 3 cars, because 3 of us work... Relatively near home, but not enough to allow ourselves to go by bike or by foot...» (M2, RE, 28 y.o., suburb, employed, living with parents)

Then in these places travel choice is driven by *obligation*, due to the absence of real good alternatives; the ones that, despite similar conditions, can live without the car is mainly because:

1) They have and use a moped (*«Even people which have not the passion of the two wheels... at the end of the day they buy it, with a bit of reluctance, because it's the only alternative»* S1, RM, 35 y.o., employed, outskirts of metropolitan city, living with partner and child);

2) They can also rely on a car when needed (*«There are mornings in which the bus came on time and I suddenly arrive at the metro, but this is rare [...] I need my father's car at least to reach the metro station [...] I take it by choice. Because I could have bought a car, but it's ok for me to take public transport. Also in some areas like mine* [outskirt] *there is a lower demand so you can breathe, there is less people and you can sit and enjoy at least a little bit the journey»* R., RM, 27 y.o., outskirts of metropolitan city, employed, living with parents)

3) They have a strong believe/civic engagement and decide to rely on the – even poor – public transport (*«The point is that the public transport service is not as good because you use the car! And you use the car because the public transport is not as good. Because if only all of us would decide, once and for all, to use the public transport, as Greta Thunberg asks to us, with a growing demand the service would be more frequent»* – A., RE, 29 y.o., suburb, employed, living with parents – the *only one* in the Reggio Emilia group that have not indicated

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[60] Where this term communicates some kind of *privilege* that they don't have.

the car as main mode) – but not without inconveniences (e.g. last buses for the closest city are at 8.30PM, precluding nights out of town; difficulty to organize meetings with friends outside the town, with a consequent *stigmatisation* as 'the one who don't drive' and that causes planning problems to the others).

While if we dive into some metropolitan areas or city centres, the automobile is not anymore an "obligation", but rather a "faff": *«From the point of view of a 19 years old Milanese guy... to use the car is a faff*[61]*»* M., MI, 19 y.o.) as we will explore in the next paragraph.

The opportunity of a car-free lifestyle: the urban diaspora

It is then glaring the enthusiasm of the voices of those who moved from suburban contexts – in which they grew up – towards bigger city centres, mostly for study reasons. People from the hinterland/little suburban towns moving in the city (or that would be likely to move there) and live the "*dream"/"Heaven"* of a car-free life and choosing to move there in the first place to study, but also for the precise reason of "*getting rid of the car*"/and car dependence, feeding the urban diaspora:

> *I come from the hinterland. Public transport does not exist there [...]. So there is the car. For me, getting the driving license has not been a big deal, because at the end of the day it was a normal thing, I mean. The car is the daily routine [...] It's not like in Milan, where you have a lot of bars and things to do in the immediate surroundings. So sometimes you even do 20km just to go to a bar. So I mean... honestly I wish myself a life without a car! I developed a form of hate toward the car. Using it causes me stress, I got nervous. I don't like it. […] I moved to Milan also to stop to use the car! For me it was like Heaven when I saw a bus every 30 minutes all night long, it's perfect, what are we speaking about??? [Figure 5.9] [...] in this city where you have the possibility to move in every moment with 2 cents, because actually how much is for a monthly ticket, 30€? With the car how often do you pay 30€?! [...] I came here on purpose, to not use the car.* (G., MI, 27 y.o.)

> *In the near future, I see myself in a city in which public transport works, where I am able to move freely* (E1, CT, 21 y.o.)

> *If I were to move to a city, I would be the first to drop my car somewhere!* (C., RE, 32 y.o.)

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[61] Translation from the very milanese slang "è uno sbatti".

- *Personally, one of the things I prefer of living in cities – my main experiences have been Lisbon and Bologna – is the fact of being able to rely on an efficient public transport service[62]* (F., RE, 27 y.o., suburb)
- *To rely! This is the keyword. Here, you try.* (C., RE, 32 y.o., suburb)

Especially in cities where the infrastructures work well thanks to decades of investments, the car-less lifestyle is becoming something more tangible and real in society in general: «*I don't know your circle of friends, I look at mine... we have all been raised in families with an average of one car per each... now they are rather halved. If they are in 4 they have 2 cars, if they are in two have one car... This needs time, but...*» (F2, MI, 34 y.o.).
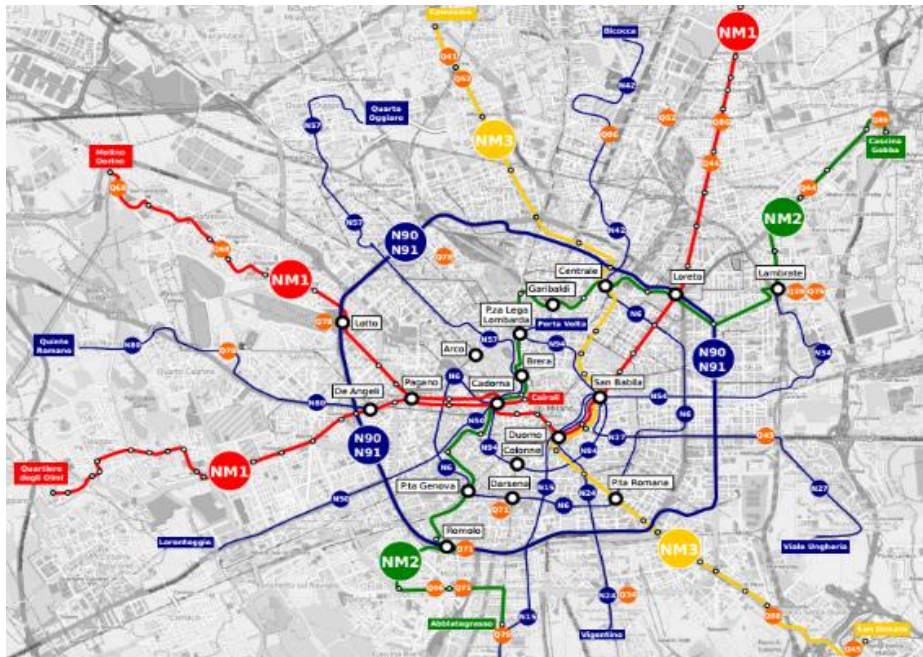

Figure 5.9. Night lines of the public transport service in Milan. Source: CityMapper
https://citymapper.com/news/1552/ecco-come-funziona-la-rete-bus-notturna-a-milano

If Milan represents the "Heaven" for public transport users, Catania downtown in particular is appreciated for its walkability (Figure 5.10):

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[62] Public transport as a real *opportunity*.

I am not from Catania, I come from the province of *****. I preferred Catania as the city where to study, because I knew I would have been able to move by foot. (A., CT, 28 y.o.)

The conditions in which I live don't allow me to realise what is my dream [...] I would really prefer to live in Catania downtown. Many says "Ok but the smog, the noises, this and that"... and I answer 'Yes, but I could move by foot! Or anyway, to get rid of my car'. So if I were able to choose... I would live in Catania downtown. (M., CT, 25 y.o., suburb)

Many colleagues of mine did it. Even if they lived in close towns, they preferred to come and live in Catania instead of searching for parking in the morning. (A, CT, 28 y.o.)

Figure 5.10. Examples of Catania downtown streets. Photos by the author.

5.1.2   A matter of generations

Residential choice: once a suburbian, always a suburbian?

Speaking about the ways in which we grew up and the possible differences with how we currently live, as suggested by the last citation, there is also to consider the undeniable issue – emerged spontaneously among the discussions – of the substantial legacy left by most of the parents of the interviewed to their sons and daughters: the suburbian life. Millennials are often, consciously or unconsciously, willingly or not, inheritants of their parents' choices. Something which is often difficult to disengage with, even growing up (having roots, relatives and friends in the suburbs, or simply for place attachment), resulting often in car-independent people stuck in car dependent places.

> *I live in M***** [hinterland of Catania] *because my parents live there, so probably I will stay there because I will have the possibility to have my own house there. But I would really prefer to live in Catania downtown [...] seriously it makes me sick that I have to take car even to go to the supermarket.* (M., CT, 25 y.o.)

> *My mode choices are due to the fact that I live with my parents. And it is not a choice that I have made; it's a choice that they made, and surely I won't make the same choice. Well... until I have to pay back my car I won't leave the house for sure... On the other hand maybe, if I moved before, I'd have avoided to purchase a car [...] I would rather live in the city centre without a car. Even if to be honest, I have this problem: that I still have a strong bond with my hometown. I have friends, I have my family... And I think I will always be bound to the car, because if I want to have dinner with my parents, I need a way to come back. If I want to see my friends living outside, I need a way to move. So at the end of the day I think in my life I will always need the car.* (I., MI, 29 y.o.)

If in most of the "first-generation urbanised"[63] it is likely to see an inclination to urban life, at least for what concerns their present life, taking distances from their parents' choices...

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[63] Using this term to refer at the ones which were the first in their families to go live in bigger cities to study.

Since I already lived the small-village life... Enough! It was enough for me. [...] Ok my hometown is not so little, but is little in the... mental, metaphoric way! (E1, CT, 21 y.o.)

When I had to choose where to live, I've searched for something close to public transport. Many of the people of the previous generations I see that opted for buying houses in the hinterland, far away from the city centre, because it was more beautiful, nicer, they had their small independent villa with the garden and everything, because for them the car was already part of their life. It was not a "oh what a fuff I have to go out and I have to take the car"; no. "I have to take the car anyways, so, while I am at it, let's go live outside that at least I stay away from this and that..." (F1, MI, 27 y.o.)

...In the most deep suburb – the little towns of the Reggio Emilia province – instead, it is possible to still seize that suburban affection, and – as a consequence – a sense of gratitude for their parents' choices, expressed in the overall wish of imagining a – more or less near – future there (with their permanence in bigger cities considered good, but only related to a *phase of the life*, not a long-term choice), especially when thinking about raising kids:

I had a beautiful childhood here. Also I came back here for safety reasons. Because where I lived [in Minneapolis, USA] *with him* [her baby]*, until he is a child it's ok, but thinking of him as a teenager there... I was already anxious. [...] when I was there I was dreaming to come back here to raise him in a dimension suitable for a healthy growth [...] I am all grown up, adult, I don't care; cool to live in a city, there are many things to do, it's even more funny, it has more opportunities, but... for him, which has to grow, my choice is here, no doubt. [...] When you have children, the best thing you can do is to raise them in these kind of contexts. Even accepting the compromise of less things to do, poor public transport...* (M1, RE, 28 y.o.)

Probably I'll soon go back to live in a city, my current situation here is totally temporary. But in a city I rent a house. If I had to plan to purchase a house, with the intention to say "Ok, here is where I'll build a family", then this has to be done in a place with less than 20.000 inhabitants. One of the things I am most grateful to my parents, is that they waited enough to have kids until they could afford a house with a garden. Children have to be raised in a house with a garden! Full stop. [and everyone around the table nodding] (A., RE, 29 y.o.)

I wouldn't buy a house in Bologna downtown. I would rent a house there in this moment of my life, but I'm quite sure that a good remaining part of my life will

be spent in places that are not big cities, because even me, after a while, I get
tired of this. So I prefer maybe to commute a bit, live the professional life in a
big city, maybe living there few days a week, but mostly relying on a place
similar to where I live now [...]. A cozy house in *** with a courtyard costs one-
tenth and it's more comfortable. (F., RE, 27 y.o.)

For those who never left their suburban life, this translates in an even stronger place-attachment and impossibility to imagine themselves in other situations (territorial, but also of habits: *«If you think of where you live and how you move right now, do you think it will change in the next years?»* someone looked at me as it was really an overstatement, some others shook their heads thoughtfully: *«No. It won't change»* (G., RE, 22 y.o.).

But this *suburban dream* is something not only relatable to the little towns of the Reggio Emilia province, even if there it's more self-evident:

- *Life in the city is surely better from the point of view of services, you always have*
  something to do at night, you have everything... But it's also sure that cities come
  in with all city-related things: traffic, expensive apartments, both to buy and rent,
  smaller houses... (M2, RE, 28 y.o.)
- *And you don't have a courtyard!* (F., RE, 27 y.o.)

  I don't like too big cities, because they're chaotic. Too many things all together... they
  wig me out! I've always lived in these contexts... (G., RE, 22 y.o.)

- Interviewer: *'So the commuting life is something that you may keep, that you don't*
  mind so much...'
- *I never did!* (F., RE)
- *We are used to it.* (C., RE)

It is something visible in other contexts as well, such as Catania or Pesaro areas, especially – again – by people originally coming from suburban contexts:

> *I would prefer a little villa in the hinterland rather than one in the city*
> *centre. Because I like the city, but the city centre has always the*
> *problem that either you have your own single house, or you're*
> *continuously bothered by people living above, below, next to you... [...] If*
> *you live in your own house, isolated from the city, you have more the*
> *sensation of having your own privacy, your moments... your house,*

which you don't have to share or reaching compromises. [...] But I think it's a matter of age... I came to a point in which I really just want to have a garage in which to use a hammer! Which I currently can't, because if I start doing it, I bother everyone. (S., CT, 28 y.o.)

Personally, I would really love to live in the countryside. The city centre in Pesaro is not for me. Purely for aesthetic reasons. (M., PE, 34 y.o.)

So, a natural question comes up from these considerations: *once a suburbian, always a suburbian*? This idea may even surprise Millennials themselves, once they realised that the conclusions they got with their discussion is not so far from their predecessors' attitudes:

Oh cool to realise that actually none of us abandoned the old dream of the suburban villa-with-courtyard... we are bastards!! (A., RE, 29 y.o.)

"The clash of generations"

What we saw in the regression analysis was that, in the attitude towards car choice, a role was actually played by the cohort, even if not so determinant if compared with other variables. But what are these generational differences? What is this *cohort effect* composed of? As a first result, it is interesting to note that the node of "car dependent people" was almost totally composed by the references regarding the behaviour of the interviewees' parents[64]: *«I'm quite sure my parents are automobile-dependent [...] my mom used to cycle when she was an architecture student, so with all the tools and stuff it was very uncomfortable... so now she drives even to make 100mt [...] impossible to tear her away from her car»* (M2, RM, 31 y.o.); even in bike-friendly areas such as Pesaro: *«Loads of people here use the bike, but have their parents with their SUVs parked»* (B., PE, 21 y.o.); *«I have always seen my parents moving by car. They both do not have a bike»* (M., PE, 34 y.o.).

What is interesting to note is that car dependency can also be related with an old-fashioned way of planning the employers' worktime, especially in the Italian "provincia" (e.g. the lunch break at home with the family, which could be a stereotype of the southern Europe "boomer"):

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[64] Except for some cases in which "symptoms" of car dependent people were also found among the interviewees, e.g.: *«I've used the car even to come here [...] I know it's the worst moment of the day to drive! [...] Sometimes I go to N*** [area of Milan] by car, because... I'm lazy, and by foot it's 20 minutes and I'm no longer 17 that I used to walk a lot... with the car it's 2 minutes. .... yes and 14 to park it»* L., MI, 30 y.o., city centre of a metropolitan city.

My dad works in F**** [town nearby], it's more or less 10-11km, which made by car – without traffic – it takes a few minutes, while by bike it would be at least 30-40 minutes, to go and then again to come back. He also has a 2 hours lunch break, so it would even mean not coming back home to have lunch. You already have less and less free time, so if you even add more time in transport... (M2, RE, 28 y.o.)

While younger generations today are facing very different job conditions and market, which is flexible, precarious, almost incompatible with something which was once automatic such as finding a permanent job and buy a house in which to live "*forever*": «*One could also buy a house, but there's no guarantee that one will work there forever. And then what happens? If they move you, you'll be back to square one»* (M2, RM, 31 y.o.).

What happened then within the focus group sessions was to dig into the parent-child relationships. What was recurrent and similar in each territory analysed were, in particular, the parents' reactions to their sons and daughters' sustainable choices and lifestyles, which made more and more evident the emergence of a gap between these two generations.

For instance, it emerged the persistence in the Baby Boomers generation of a stigma on public transport and bike use as "*inferior*" modes if compared with car, often associating the use of those modes as something related to their past in which they didn't have a car (like it was a previous life), as something miserable and "*demeaning*":

We are in 4, with 3 cars. My mom recently said to me 'I would have never imagined that, at 60 years old, I had to go to work by bike again'. Because there were no cars available that day. So for her it was something really demeaning: 'I don't have a car at my disposal when I have worked so hard to get it'. So for my parents to go by bike is something very outdated, and with a social class perspective, it makes you feel inferior like... to the world. (I., MI, 29 y.o.)

In general considering the bike as dangerous and/or not a real mode of transport:

My mom when knows that I'm taking the bike lights up a candle. I mean she is sure that I'm not coming back home. Because she sees it as the most dangerous means in the world. (F1, MI, 27 y.o.)

[my parents] *never drove a car before they were 20 years old, because they couldn't afford one. So my father [before that] used to cycle... And then the car came as some sort of luxury, of emancipation [...] So still today he has some difficulties in understanding that I don't cycle as a sport, I use it as a means of transport, and also because I like it. But he*

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doesn't understand this, he doesn't understand for example that for 5km I say 'well I go by bike'. He replies 'The f**k are you talking about?! Just take car!' [...] he doesn't understand that cycling could also be pleasant. (G., MI, 27 y.o.)

And public transport as a less safe and decent way of moving:

*My parents used to keep asking me why I use public transport. But at some point, my mother gave up. (*O., PE, 31 y.o.)

The fact is that it was my own dad that kept saying 'But do you really have to take the bus?? Come on I'll give you a ride' [...] our parents in the first place did not educate us in a certain way. Often they say 'Uhm maybe you should avoid this... Maybe I'll give you a ride... I'd rather reorganize my day or whatever but I'll give you a ride'. (C., CT, 26 y.o.)

As suggested in this last reference, Baby Boomers probably had a role in transmitting this whole imaginary regarding modes alternative to car to their children in their growing-up process[65], in some ways suggesting that the car is the safest and the best way to move, which may over time be integrated into their value system and personal norms (Haustein et al., 2009)(and that's another kind of legacy they left to their children): *«My parents said to me 'if you want we buy you a car' [...] so that they could be less concerned at night»* (R., RM, 27 y.o.). Or simply by pushing them into the car purchase / licensing process as the only way to get independent:

My parents gave me an ultimatum. Driving license, or.... [...] because of 'you can never tell' (A., CT, 28 y.o.)

I don't have the driving license. Though, my mother would like me to drive more, because she drives a lot [...] At the beginning I didn't want to do it. I had a boyfriend, my friends... I didn't feel this need. Now there's my mother which says 'come on you're growing up, you are 21, it's time you take your driving license' (B., PE, 21 y.o.)

It were my parents that had in mind to buy me a car, I only wanted to get over with that [getting driving license] *as soon as possible. Then I thought, well, now what I am supposed to do with this?* (M., CT, 25 y.o.)

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[65] Which corroborate the analysis of Döring, Kroesen & Holz-Rau (2019), which say that there are indirect parental socialization effects on mobility behaviour via residential location and attitude on car availability and commute mode use, as well as the already cited study of Susino & Liu (2016) which talks about how the mobility choices of parents influence the travel patterns and perceptions of their children.

In fact, often this push comes from a call on being more '*independent*' / '*autonomous*' / '*emancipated*':

> *My mother said 'Finally you are not dependent on us anymore!!! And*
> *you emancipate yourself'* (I., MI, 29 y.o.)

> *My father tried to push me to do the moped license, for autonomy*
> *reasons [...] but it was me that I said 'look, to be honest I like to walk',*
> *so...* (E2, CT, 20 y.o.)

> *I was convinced* [to do the driving license] *by my ex, with the support of*
> *my mom [...] Then my mother said: 'finally we can stop carrying you*
> *around for everything in life!'* (M1, MI, 19 y.o.)

It is curious also to see in some cases the attempts of the Millennial sons and daughters to convince their parents to use more sustainable modes (which is a nice picture of domestic knowledge transfer, whose relevance is maybe undervalued); sometimes with success:

> *When they travel, the first thing my father does is to rent a car.*
> *Because he needs to drive, and he doesn't want to be subjected to the*
> *public transport; he wants his autonomy. And I said to him: 'Don't you*
> *dare to rent a car in Barcelona because it's a waste of money! You*
> *won't need a car in Barcelona'. [...] They used the public transport, and*
> *they were so surprised [...] and at the end of their holidays they said to*
> *me: 'You know what, maybe in this city... we could make it with the*
> *public transport!'* (M., CT, 25 y.o.)

...but most of the times with poor results, bringing to this sort of conflict between parents and their sons and daughters ("*the clash of generations*", to play with words citing the famous piece of Huntington, 1996[66]):

> *I often argue with my parents, who say to me: 'If it took you the same*
> *time, why do you go to work with train and not with the car? [...] who*
> *cares, go by car!'* (I., MI, 29 y.o.)

> *They both have a sort of refuse, that I really don't get, for the public*
> *transport. One day in my hometown there was a shuttle service for an*
> *event. My mom firmly refused to take it: "Mom, you can take this"*
> *'Me?? I don't use public transport! Absolutely! No way!' 'But why??' 'I*
> *do not get on public transport' [...] My father even says: 'If I have a car,*
> *why should I use public transport?' 'Well dad because of this, and that...'*

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[66] *The clash of civilizations.*

'I don't care, I use the car, I've always been used like this and I don't want to change' (E1, CT, 21 y.o.)

My mother works 1.5km from home and she goes by car. In fact, sooner or later I will slash her tires. (A., RE, 29 y.o.)

Symptoms of car decline as a desire object?

When searching for clues related with the car as a status symbol, there are different elements coming up. Especially among older Millennials (born in the 1980s) it is still possible to seize some glimpses of the golden age of the car: *«I think I have never been so happy as I was the day of the driving license. I felt like God on earth. I was super happy [...] maybe because it was the very first time I was doing something adult for real»* (F2, MI, 34 y.o.)*; «I had a girlfriend at that time that lived in the opposite side of the city [...] so I felt super cool when I was able to tell her "S**, I can pick you up with the car! The night bus days are over! »* (L., MI, 30 y.o.)

But what seems to happen now, hearing the voices of the younger Millennials, especially those living in city centres, is the fall of the myth of the car and driving license as status symbols (which is something they tend to relate to the past):

[our parents] *have been used to drive in the city, because you used to move by car, and it was also a matter of status – 'I have the car because I can afford a car so I use the car'. It's like the iPad few years ago! I have the iPad, I can afford the iPad. We are people that appreciate more the idea of a city as an enjoyable place to live, with water channels[67], more bars, bars in which to drink, which is very important... a different vision of the city.* (F1, MI, 27 y.o., city centre)

They were the children of the economic boom... having a car was a status symbol. (S., CT, 28 y.o., city centre)

I try to put myself in the shoes of those who choose to live in the suburbs to have a better house, even with less comforts, just because it makes you feel wealthier. Like having a beautiful car. I think. Because this is

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[67] This refers to the municipal referendum on the re-opening of the underground water channels of Milan ("Referendum Cittadino su Riapertura sistema dei Navigli") which took place on the 12/06/2011 and saw a strong division amongst the citizens, since it implies a total re-design of the mobility plan of the area. In fact, with the advent of trains for freight transport and cars in the XX century, most of the channels – built and used from the XIV to the XIX century – were covered to become main and important roads). 94,32% of the voters voted Yes for the re-opening. Source: https://www.ilpost.it/2020/01/21/riapertura-navigli/).

> *the old mentality... like having a house in the city centre, that because*
> *it's littler, you can but less stuff in there.* (E2, CT, 20 y.o., city centre)

Car and driving license now appear to have a more pragmatic role, representing an additional option among others, a useful alternative "*just in case*" (but not automatically the first choice):

> *I learned to drive one year ago because I think it is important to be self-confident when you drive, even if I don't drive frequently [...] So just in case I would need the car, I will be able to drive, even if it's not my daily choice.* (E2, CT, 20 y.o., city centre)

> *I did it more for general convenience. Because you never know in life, if you may need it... To be honest, I didn't even want to do it, then I was convinced.* (M1, MI, 19 y.o., hinterland)

Borrowing a quote from chemistry, since *nothing is created, nothing is destroyed, everything is transformed*[68], it is possible then to see how the status symbols related with mobility changed and are still changing over the years. For instance the golden age of moped – considering the 50cc model – (especially in Reggio Emilia / Pesaro area, land of some main popular moped factories) shaped the imaginary of the older Millennials:

> *At some point you had to have a moped, because it was almost a status*
> *symbol. Something that was increasingly popular maybe in the Eighties.*
> *Everybody had a moped in the outskirts. I don't know if this is a typical*
> *Romagna/Marche [regions of Reggio Emilia / Pesaro] attitude... I*
> *remember the first time I passed by the big factory of Malaguti, and I*
> *said to myself 'Daaamn look at that, there is the billboard of the*
> *Phantom[69]! Holy s**t they produce it in there!' I was overjoyed. Now the*
> *factory isn't there anymore...* (M., PE, 34 y.o., outskirts).

While now, especially for the bureaucratisation of moped licensing (the so called "patentino", which wasn't necessary in Italy until 2004) and the higher costs related to insurance and fuel, the moped is not anymore as spread as it was, and in Italy the sector of 50cc moped, once flourishing, is in constant decline[70].

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[68] Attributed to the French chemist Antoine Laurent de Lavoisier, born in 1743, discovering the law of conservation mass. Source: https://simple.wikipedia.org/wiki/Antoine_Lavoisier
[69] Famous moped produced by Malaguti factory.
[70] As described in this nostalgic editorial of Corriere della Sera: "Adolescenti e ciclomotori, fine di un amore?" ("Teenagers and motorcycles: the end of a love?") 18/5/2017, available at:

What happens now in the current younger generations is again the emergence of new status symbols, all mainly related with "the three revolutions" (cfr. par.1.3.3):

- Micromobility, for instance e-scooters becoming iconic: *«If you have to move around the city centre... with the scooter you can also act like the cool one»* (B., PE, 21 y.o.)
- Car sharing, especially when nice cars are provided by the service, which rekindles the willingness to drive and the appeal of cars: *«I loved it... Because when I took the license, after a year without driving because I wasn't interested, I started to drive the Fiat 500 and I loved it! So after that any excuse was valid to use it, mainly because I loved the car! »* (C., CT, 26 y.o.)
- E-mobility, with Elon Musk creating the myth of the Tesla; but also the idea of e-mobility as something "green", where being "green" is becoming something cool: *«The other day I've seen a Tesla! Eheh which would be gorgeous to have a Tesla! »* (G., RE, 22 y.o.).; *«One could take the e-car only because it looks cool to act like the one who saves the planet, even if actually he doesn't give a damn»* (F., RE, 27 y.o.).

5.1.3 **A matter of life stages: *"I've always been a student"***

As a premise, it should be noted how within the group of people interviewed, the vast majority was still living with the parents (in less urbanised area it was almost the totality, regardless of age or occupation – see Annex E), and only 1 out of 35 was living alone, reflecting the average delay in "flying the nest" in the Italian territory, as observed in par. 4.1.2 (average age of young people leaving the parental household in Italy in 2019: 30.1). Furthermore – still reflecting statistics – many of them were still students or in their first job experiences, only three out of 35 having/expecting children – so it was common to hear that "*by now*" their mobility needs and residential choices were mostly linked with their *student/precarious job* conditions: *«At the moment, for the way I live, being a student and living near the University and easily using the public transport for the trips I need, I don't need my own car»* (E1, CT, 21 y.o., student).

But what about the future?

> *When I search for a house, I always look for the nearest metro station. Always. Actually, I've always been a student, so maybe it is also for that... I don't know in the future, to be honest* (M2, MI, 26 y.o., just graduated)

https://www.corriere.it/sette/18_maggio_17/adolescenti-ciclomotori-fine-un-amore-bc9ce00c-5791-11e8-bd9c-ca360360a9e7.shtml)

By now, I know for sure that I don't need a car. But I wonder for the future... when you will have a job – I hope – what would you do? I mean... timetables will change, you will be required to be in some place a certain time, you just can't go around with public transport [...] here it won't be feasible. (C., CT, 26 y.o., student)

*I am super sure that sooner or later I will have to go back to the car. (*A., CT, 28 y.o., employed)

I don't have this need by now, because I have the subway nearby. But maybe in a year I will change my job and I will have to move – let'say, in F*** [hinterland] *and I will need a car.* (R., RM, 27 y.o., employed)

In fact, when listening to the voices and experiences of some older Millennials, we grasp a sort of rapture with their car-free past, as something associated with the slower paces of the student/younger life:

In Rome as a student obviously I lived near the university campus, so I was able to move around easily by foot or by public transport. But now as a worker I live outside and I am more dependent on the car. (M2, RM, 31 y.o.)

When I was a student, I had a more relaxed pace [...] now, when you work, you don't. You have to be on time, sometimes earlier, so the car allows you higher usability and speed. (M., PE, 34 y.o.)

I said to myself... I am not 17 anymore, when I used to walk a lot! (L., MI, 30 y.o.)

Finally, another thing that represented a rapture with their previous mobility habits, is *parenthood*: car dependency rises after a child? In which ways? Regardless of the level of urbanisation or infrastructure's quality, the issues which were brought up were mainly referred to the need of the car for emergencies/more things around to do linked with the baby:

I am being pushed to buy a car... because you know in this crucial phase of life... They told me that it's not possible to imagine a life with an incoming baby, without a car [...] people I know, that never had a car, found themselves almost forced to... you know, for emergency situations, and because when you have many more things to do, it's better to have your own car. (F2, MI, 34 y.o., incoming child)

For hostile public infrastructures:

My mom raised me without a car. It wasn't easy. She told me a lot of stuff. For example, on the public transport with the stroller... you have to close it each time, it's the rule. (J., MI, 23 y.o.)

Or simply... because it's *obvious:*

It's mostly the way of living that changes [...] you don't go out every evening anymore, the afternoon you have other commissions and if you go out with the baby you obviously go with the car. (S1, RM, 35 y.o.)

Also, sometimes – as noted above – the choice to raise a child in a greener and quieter place (even if less served by public transport) was stronger than the will to live the opportunities of the city:

If I hadn't children, I would stay in a city. I've always wanted to live in a city. But with kids, the best thing you can do is to raise them in this kind of contexts. (M1, RE, 28 y.o.)

5.1.4   A matter of *inclination*: the growing up context

In the cross-cutting analysis of the inclination towards modes, a general observation has been made on the importance of the growing up context in determining a stronger or weaker inclination towards one mode or another. Sometimes the inclination towards a mode remains the same or is being reinforced through time: for example, on the seaside (Catania, Pesaro), with favourable weather and geographical conditions, it is more frequent to hear about the pleasure of slow modes: *«I love going by foot, I've always done that, by the way»* (C., CT); *«I love to walk»* (A., CT); *«I like to walk»* (E2, CT); *«Living here, I go by bike because it's easier, and in summer evenings, it's fantastic, I like to go by bike, to feel the wind... and when it's hot it's terrific... »* (B., PE).

Some other times, it happens that people subvert what they always did, for example *G. MI,* which grew up in a car dependent context and decided to move to Milan to realise his dream of a car-free life; or *J. MI,* which grew up relying only on public transport, and the moment she got her first job she bought herself a car. Inclination though appears to be influenced by the growing up context, which includes all the good and bad experiences lived (as it will be deepened in par. 5.3.1).

What's more, is that it is not only a matter of weather conditions: a difference is surely made by the fact of being born and raised with the right infrastructures and appropriate education, which is often something that the Baby Boomer generation was lacking if compared with their sons and daughters:

I speak as a 19 years old guy born with the bicipolitana, so I mean… Ok, my mom have always been used to cycle, but if compared with her generation we are like digital natives: we were born already knowing how to use a phone, and how to cycle. I mean for us the bike is a way of moving… I mean THE way of moving! And maybe this is what the previous generations lacks. (S., PE, 19 y.o.)

Now at school they do a lot of workshops, for instance there are days in which when the pupils go out of school, there is the traffic police closing some road portions to encourage walking home, you know there is a totally different education now. (C., RE, 32 y.o.)

Particularly evident when speaking about public transport: «*Living in Milan I've always been used to go by foot and by public transport*» (J.,MI); «*Living in Milan, I've always been used to take public transport since I was a child, also in a place in which it's not so frequent […] and to be honest it has never been a problem for me to move with it*» (M1, MI); «*I started to take the bus when I was 11. It's 20 years that I've been taking it, and I've always been super fine*» (O., PE)

Finally, an emerging difference with the Baby Boomer generation was also about differences related to gender: the Baby Boomers raised with a strong gender gap about mobility habits (driving as a prerogative of men; car as a symbol of masculinity); they had this legacy from their parents/social context and sometimes/somewhere they perpetuate these differences. During the focus group sessions, it was frequent to hear about car dependent fathers (more than the mothers): «*In my case, my mom has always used the bike; my dad no. He has always used the car, even to move in the street in front of the house*» (G., PE); «*My dad would use the car even for making 100 mt, my mom, when possible, avoids to drive*» (RM, S2); or very attached to their cars («*My father really cares about his cars. Then he pushed me to use the car sharing service so that I could practice with it instead of his car […] so my dad was totally happy!* » C., CT)

But is this gender gap still visible? Quantitative data (par. 4.4) have shown a weak role of gender in determining car choice as main mode, a sign that this kind of difference is slowly disappearing:

If I think of my hometown, the majority of all the women of a certain age, don't have a driving license. I mean it was the man of the family who had the license. And if I think of my parents, my aunts… they all have the driving license but actually who drives in the couple is often the man. Is it still like that? (G., MI)

5.2 The Millennial Gaze: imaginary behind the modes

This second part of the chapter contains the analysis of the imaginary that Millennials expressed during the focus group with regard to each mode: "The Millennial Gaze", as I put it to cite one of the authors which inspired most this entire work, John Urry[71].

To simplify the huge amount of information collected during the qualitative analysis, this part will be structured around the *word clouds* that have been extrapolated by NVivo after a process of text analysis which followed these steps: i) creation of NVivo nodes for each mode of transport; ii) For each of these nodes, creation of two sub-nodes to collect separately the positive and negative references related with that mode (pro and cons); iii) run the word frequency analysis for each of these sub-nodes, which counts the frequency of each word and produces a graphic output (the higher is the frequency, the bigger is the dimension of the word). Since the interviews were implemented in Italian, this process underwent a translation procedure: i) the integration in NVivo software of an Italian dictionary to avoid the count of "stop words" (articles, pronouns, etc.), ii) run of the word frequency analysis; iii) translate the word frequency table from Italian to English evaluating case by case the correct semantic field (e.g. evaluating the meaning of "comodo" as convenient or comfortable, verifying the sentence context); then iv) manual process of word grouping on the basis of synonyms and stemmed words (e.g. *park, parked, parkings* all grouped under the word '*parking*'); v) paste the clean and translated word frequency table in the online software offered by "Word it Out"[72] to create the graphic visualisation.

Car: the doom of the exasperating traffic, but the comfort of certainty

If we start with the "word cloud" about the *cons* of car and driving (Figure 5.11), there is something that is easily noticeable while reading the words: the amount of negative emotions. *Traumatic, angry, anxiety, stress, nervous, disturbing*: a series of human reactions related especially to *traffic, parking,* and the danger of driving. «*I don't drive because it scares the hell out me to put myself on the road, especially in this city. Yet as a pedestrian it is difficult to survive traffic in Sicily in general... but in the car it would be traumatic for me*» (A., CT, 28 y.o.).

This factor, combined with the effects of car restriction policies and the rising of the costs of driving ("*cost*" and synonyms where mentioned 12 times), enhance the convenience of other modes, even in the more car dependent *people* («*The issue in cities is the parking.*

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[71] "The Tourist Gaze" (2002), Sage.

[72] https://worditout.com/word-cloud/create

When I go to Bologna I don't go by car because otherwise I would keep driving around for an hour trying to find parking. So I rather go by train and then by foot. The problem of the big cities is that one» G., RE) proving the actual effectiveness of these policies (e.g. pedestrian zones and parking fees which make the use of the car less convenient than other modes).

It emerges also the hot topic of SUVs, which were nominated in all five cases almost always with derogatory terms, saying that they occupy space, they are symbol of aggressive and careless car drivers, and dangerous.

Figure 5.11. Word cloud for car: cons

What remains strongly attractive in driving (Figure 5.12) is its *convenience* – not in economic terms, but mostly for reasons linked to time, logistics and flexibility, as testified by the high presence of the word "*minutes*" which was used to compare the higher travel times especially of public transport and walking; and of all the expression related with flexibility (Table 5.3).

> *The thing is that with the car you feel more comfortable: I mean I am in the car and I can go wherever I want. Do I want to swing by the supermarket? It's not like going with the bus, I go 5 minutes and come back. I feel more free to change my plans last minute, go wherever I want, in my intimacy...* (F1, MI)

Sometimes when in need, and some other times for ignorance, one uses the car because is more convenient using the car. It leaves you free, you go out to do groceries, you go home... (F., RE)

Figure 5.12. Word cloud for cars: pro

Table 5.3. Frequency of words related with flexibility of having/driving a car (retrieved by NVivo)

in need	
have the option	
last minute	
rely	*= Flexibility*
emergency	
have the choice	
swing by	

Also, what emerged as car dependent trips were three main things: i) the most cited was the *moment of the day* in which the trip was made: to go out in the evening / come back at night / go out in the early morning, mostly for safety concerns and/or because of

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lack of other options[73], ii) to *carry things* (bags, groceries, furniture); iii) to reach car dependent *places.*

Additionally, a substantial space was dedicated to discussions about car purchase and driving license, in which it emerged how the reasons of owning or not a car and a driving license were very similar. The reasons concerning the "why not" were mostly given by people still studying and/or living in city centres, which didn't feel this need; the "why yes" included often the fact of living in car dependent places in which it was the only alternative; of being more independent; of being more comfortable with the idea of having it in case of need (Table 5.4). The issue of affordability was not really mentioned (except for a couple of times regarding Tesla and SUVs), but there is also to consider that the discussions were not private, and also that many of the interviewed living in car dependent places were already having a car available (of their own property in most cases; and often still paying for it).

Table 5.4. Car purchase and driving license: why yes, why not? A summary from the focus groups

Car purchase	
Why yes	*Why not*
- I don't have alternatives (to move) - For extra urban trips (cheaper and faster) - The parents bought it / helped/convinced to buy to become more independent - For job reasons (distance / night or early morning times) - To have 'the option' (to be sure, just in case) - Independence, freedom	- Not convenient (for a student life in the city centre) - Ineffective (it would stay parked all the time / preference for car sharing services when needed – especially in Milan)
Driving license	
Why yes	*Why not*
- Just in case, you can. - Autonomy - Pushed by parents because of independence - Freedom / independence - Life stage (for entering adulthood) / status symbol - Because it's *normal* / automatic	- Not interested - No need

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[73] Word "evening" mentioned 21 times in the *Car Dependent Trips* node (retrieved by Word Frequency function of NVivo)

Furthermore, a special mention in this section should be given to the moped/motorcycle, a motorised mode which is often undervalued. As a matter of fact, from 2007 to 2016, the number of motorcycles in Italy has increased by 18,2%, with a higher rate than cars[74]. Motorcycles, mostly in southern Europe, often represents a substitute of the car; in the meantime, it also represents the first approach to motorised vehicles (speaking of 50cc models) for a substantial part of young people, especially those living in more suburban/outskirt areas (*«In the outskirts, everybody had the moped»* – M.,PE, 34 y.o.*)*. It is then interesting to note how it spontaneously became a discussion topic more than once in the focus group sessions (even if not present in the original structure) and gained its own space as an important mode to investigate. This was especially true in Rome (Table 5.5, Figure 5.13), where the motorcycle is for many people *«the only alternative»* (S1, RM, 35 y.o.) among the chaos of traffic, the difficulty of parking, the inefficiency of public transport service and the problems regarding cycling conditions: *«In Rome if you have the possibility to go by motorcycle, it is the best option [...] we are not speaking about a city in which you have an alternative. [...] Here there is not even the choice»* (S1, RM, 35 y.o.). Considering both the fact of the higher rise in motorcycles than cars, and the decline of the moped as a status symbol among teenagers, is it the case to consider it as an emerging need among adults?

Table 5.5. Percentage of coverage of discussions about motorcycle in the text in each area

Rome	8.61%
Pesaro	3.75%
Milano	0.34%
Catania	-
Reggio Emilia	-

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[74] Source: https://motori.fanpage.it/moto-e-scooter-negli-ultimi-in-10-anni-le-due-ruote-sono-cresciute-piu-delle-auto/ . Data provided by Aci (Automobile Club d'Italia) and elaborated by Federpneus.

Figure 5.13. One of the many moped/motorcycle repair shop; and an abandoned moped, in Rome. Photos by the author.

Bike: the street fight for space, safety and dignity

What instantly catches the eye in the *cons* word cloud of the bike is the expression «*You have to*» (Figure 5.14). '*You have to*' what? *To cycle, be careful, do more kilometres, change your clothes at work, pay the bike surplus to carry it on public transport, park it somewhere, bring it upstairs.* Some of these negative imperatives are due to personal attitude (no willingness to do sport or dealing with additional hassles); some others are due to a lack of services, infrastructures, or bike-friendly policies (decent parking areas both private and public, enhancement of intermodality etc.). Looking at the other terms is more and more evident that the problem is mainly infrastructural*: there is no space,* there are *disconnected roads,* the streets are *narrow,* the fear of the opening of a *car door,* cars and mopeds approaching you when cycling *next to vehicles.*
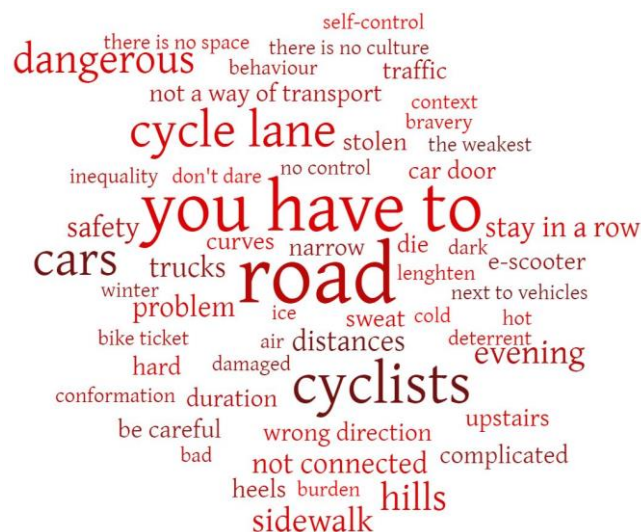
Figure 5.14. Word cloud for cycling: cons

Figure 5.15. Narrow streets of Catania, where sharing the space with other vehicles is difficult and often scary. Photo by the author.

A thing that happened in most of the discussions regarding the bike was the recurrent formation of two opposite coalitions: the ones who tend to describe cyclists as reckless and unlawful while cycling («*The cyclists can't behave as cyclists!* [...] *There is this recklessness of cyclists*» (S., CT); «*This thing of them unable to stay in line is true!* [...] *the fact that they don't have a license plate, brings out their inner...*» (M1, MI); «*Cyclists can't stay in line. There is no rule* [...] *They dont care! There is no control...*» (M., PE), even bringing to different shades of *hate* (Table 5.6); and the ones, often cyclists, which on the other hand claimed their right to have more space and a more equal distribution of space in the road

use («*It is designed assuming that the weakest have to stand at the side of the road*» - G., MI)

This reflects what noted by Marshall, Piatkowski, & Johnson (2017) in their brilliant paper "Scofflaw bicycling: Illegal but rational": bicyclists who break the law seem to attract a higher level of scorn and scrutiny, also supported by popular press which enriches this narrative[75]; but actually is the lack of space that creates conflict. "*Thus, on seemingly dangerous roads, they would rather ride illegally on the sidewalk than risk getting hit by an inattentive driver*" (*ivi,* pag. 809).

> *I cycle on the sidewalk, I'm sorry, but I feel safer.* (I., MI)
>
> *I have to stay at the side of the street and try to not get hit because one other person has a more dangerous, faster, polluting mean, which s/he can afford while others don't... It's an incredible power imbalance [...] I'm not saying 'don't stay at the side of the street'... I'm saying that a cyclist must stay at the side of the street otherwise s/he DIES, you know? And it's not fair.* (G., MI)
>
> *Sharing the street with cars, you have to be careful, as you also have to be careful of motorcycles and many other things. There is nothing protecting you. If you get hit while you're cycling... you get hit! It's not democratic.* (S2, RM)

Table 5.6. Cycling: "a hate speech"

"THE HATE"
Interviewer: *'And this "hate" towards them is equal to both categories?'* [sport cyclists and urban cyclists]
- M2: *No, my hate is different.*   - A: *In my opinion, you hate sport cyclists because they cycle all together and occupy the street*   - M1*: Me too!*   - C*: I agree*   - M2: *Yes, exactly, and I also hate those that use it as a means of transport but do not use the cycle lanes.*   *(Conversation in RE)*

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[75] Such as the article I used to stimulate the discussion about cycling, cfr. par. 3.3.2.

For what concerns the *pro* of cycling (Figure 5.16), we can see a series of terms related with good emotions such as *relaxed, very happy, awesome, wellness, "a dream",* and in pole position the simple «*I like it*», the pure pleasure of cycling. Cycling is seen as *safer* and *faster* for some, compared with other modes; it represents a good ally for latecomers; and what was curious is that it was often associated with the possibility/freedom to *drink* when going out at night («*Well also to be a little bit more free to drink one more beer, to be frank!*» - F., RE - while this is not possible for legal reasons if driving a car), a sign that this might seem a trivial matter but it's actually an important factor for Millennials, as it emerged spontaneously in 3 out of 5 territories as a peculiar privilege of cycling. One additional peculiarity of cycling is the different perception of the territory if compared with car driving or public transport: «*Now that I've been using BikeMi* [bike sharing - Figure 5.17] *for 9 months... I realise how different is the city on the bike and on a car! It seems much more smaller while cycling if compared with driving, paradoxically. Because while driving I'm always stuck at the traffic lights, actually*» (I., MI).

Figure 5.16. Word cloud for cycling: pro
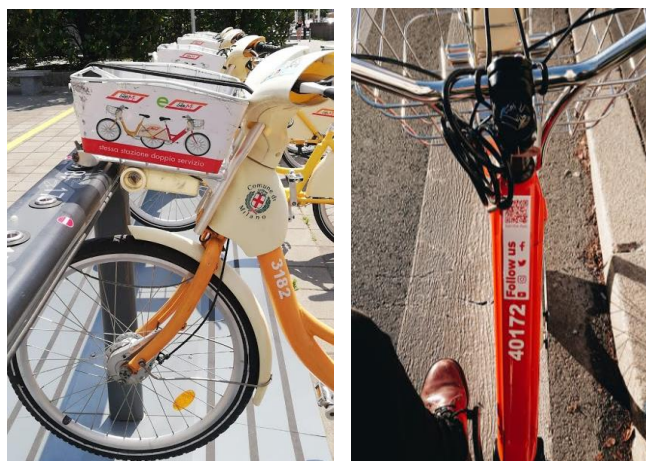
Figure 5.17. BikeMi sharing service in Milan (on the right, the e-bike model). Photos of the author.

By the way, there are some evident differences among territories. Pesaro confirms its label of "city of the bicycle", where the discussion were dominated by cycling (Table 5.7)(also visible by the fact that 5 out of 7 participants use bike as their main mode, see Annex E). But it's also worth of note that in some areas like Rome, the bicycle seems not conceived as a means of transport, but something related more with leisure time and sport:

Conversation in Rome

- M1: *Yes I would say only as a sport...*
- S1: *You only use it on Saturdays or Sundays... as a pleasure, in your free time.*
- F: *Yes, it's for leisure.*

Also because when speaking of bicycle as a means of transport in Rome...

Interviewer: Here cycling...

- F: *It's not feasible.*
- M1: *You need to be brave!*
- F: *Yes, if you want to die young!*

Table 5.7. Percentage of coverage of discussions about bicycle in each area (retrieved by NVivo)

Pesaro	35.11%
Milano	22.04%
Roma	19.35%
Reggio Emilia	16.20%
Catania	11.61%

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Figure 5.18. Examples of streets in Pesaro, "the city of the bicycle". Photos by the author.

Public transport: the thin line between "poverty shuttle" and "everyone's shuttle"

Public transport is something that, based on its quality, efficiency and reliability can be an opportunity for someone («*I have the metro just right the corner so if I don't feel like walking I can count on the subway*» A., CT), and something that for others is rapidly replaced with the car as soon as possible.

For instance, in Milan public transport can compete with the car («*Going by car or with public transport is the same for what concerns time; but the cost is totally different*» - I., MI; «*Here, you can choose*» L. MI) representing an *opportunity*. Otherwise in other places - Rome, Catania – travel times almost double because of poor service - especially extra-urban («*Travel times hugely increase. I live in A***. By car is 20 minutes, maximum 30 if there's traffic. I tried to do the same by public transport, subway and train, and it's been one hour and a half*» – F., CT; «*By car is 15-10 minutes, with the bus one hour and a half*» - M2, RM; «*I live very near to Reggio Emilia, by car in 15 minutes I'm there, while when I used to take the extra-urban bus to go to school it took nearly 50 minutes, and there were 6 buses a day*» F., RE), which means that for some using public transport will be replaced by car or moped as soon as possible, as they represent the only alternative to move in a decent way (so using public transport is rarely a choice, but rather an *obligation* until you have a private vehicle available).

The problem of public transport is mostly represented by the uncertainty of the "*arrive*" (both of the bus/train itself; and of the traveller in the desired destination) because of the

frequency of problems ("*it breaks down*", frequently mentioned in Rome), delays, cancellations, risk of missing them; also the uncertainty of "*getting back*" at night when the service is limited or absent; the fact of being bounded to timetables or risking to meet "*strange people*" and attend unpleasant events (Figure 5.19).
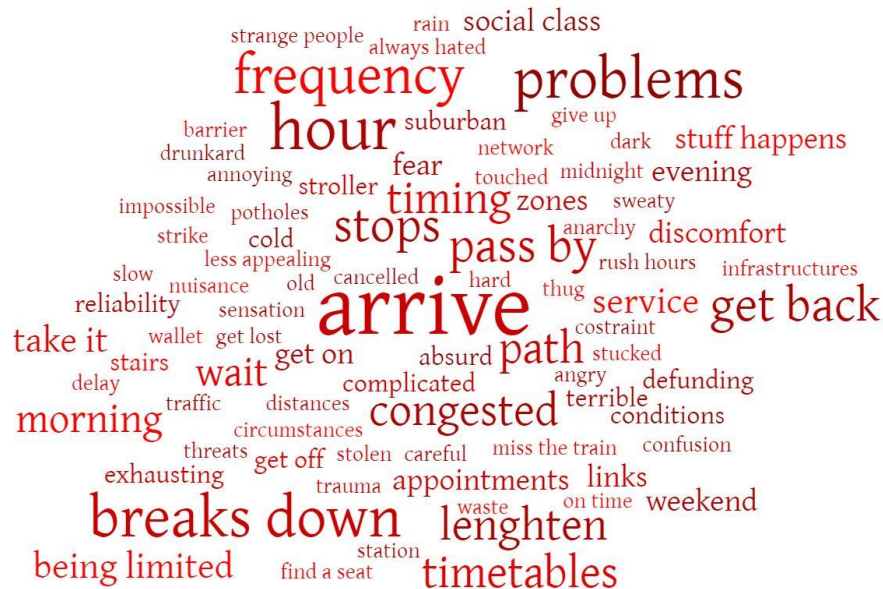
Figure 5.19. Word cloud for public transport: cons

But an unquestionable finding of the focus group is the emergence of the subway as the undisputed queen of public transport. There is a clear hierarchy that takes shape in the narrative of public transport, and it sees the subway above all other forms of transport: desired, respected, universally appreciated, as it can be noted in its centrality in the word cloud (Figure 5.20). Why?

- «*You find a different kind of people in the metro if compared with the bus [...] there is more control*» (E2, CT)*;*
- «*The subway is not a poverty-shuttle, come on. It is an-everyone shuttle!*» (L., MI)
- Efficient and working service: it is *fast, not influenced by traffic*
- It also defines the line of centre and outskirts:
  - o M2, RM: *Now Centocelle [Rome neighbourhood] is not even more considered outskirt…*
  - o V, RM: *Well no, it has the subway now!*
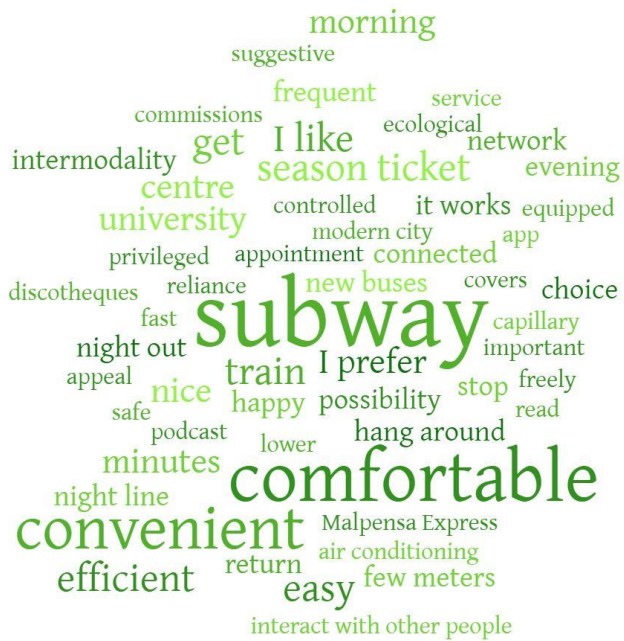
Figure 5.20. Word cloud for public transport: pro

Figure 5.21. Metro station in Milan of M3 line, Central Station. Photo by the author.

While at the bottom of this hierarchy there is, without any doubt, the extra-urban buses. In fact, especially in this case, the stigma of public transport as a "poverty shuttle"[76] sometimes (especially some-where) is still there, visible in all the geographical cases analysed:

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[76] Reference to the "meme" used to boost the discussion on public transport, see focus group structure in par. 3.3.2.

*Here, who takes the bus is who doesn't have the possibility of being
independent. So often you find people a little bit... let's say... who don't
have resources.* (C., CT)

*Well the surface transport are by definition poverty shuttles... especially
you know the blue, big ones* [extra-urban buses] [...] *the ones which goes
very far from Milan far are like HYPER poverty shuttles!*[77] (L., MI)

Conversation in Rome:

- F: *For me, this difference in the social class* [in public transport]
  exists. Personally, I mean... [...] *in the buses the hygiene is poor, the
  trips are slow, every now and then one brokes...*
- M1: *Sadly, it may sound bad, but the public transport in Rome is not
  really democratic. Because who can, goes by car.* [...] *Who can afford
  a car or a moped not even think about the public transport. Because
  it's... discomfort.*
- S1: *If you would have the choice...*

*This thing of the poverty shuttle is somehow true... because in the
outskirts there are guys that actually if their parents don't give them a
ride, they are obliged to take the bus.* (B., PE)

In the smallest territories (Reggio Emilia, Pesaro) it remains quite evident a sort of
"ghettoization" of public transport as the service for poor people and/or students: public
transport as a means for people who cannot afford/use alternative modes.

*Well, my experience with the public transport is that yes, that's the poor ones
that use it; the poor ones and other 3 or 4 like me that by choice have decided
to rely on them. If I think about the bus line between my town and Reggio, you
can clearly see it: there are immigrants, me, and other 3 or 4 that you can see
that are some Italians that decided to do so.* (A., RE)

*I feel apart from the others! [...] it's mostly the students who use it. If we consider
my age, over 30... zero, I mean! They don't use it.* (O., PE)

Other than the already mentioned qualities of subway, public transport is also
appreciated mainly for its *convenience* (Figure 5.20); for the comfort of the more modern
means (trains, buses) and of having the possibility to do other activities while travelling;

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[77] That was said with an ironic emphasis.

because when working and efficient, it represents a symbol of a *modern* city; but also for that curious, little pleasure of the "unexpected" (hang around, interact with other people, suggestive landscapes or contexts):

> *Conversation in Milan:*
> - M: *Also, the night bus is so suggestive. You can have that kind of encounters...*
> - F1: *Ohh yes, you can see all sort of people...*
> - I: *You see, now I'm very sad of coming from the hinterland, because I never had these experiences!*

The dignity of walking

As it happened for the motorcycle, a section about walking emerged spontaneously along the focus group sessions even if not planned in the structure. Walking is in fact sometimes undervalued («*Sorry I answered that I move by car but actually I only move by foot, I didn't think it was a means of transport!*» E2, CT), and there is plenty of literature dedicated to walk and walkability (Caiello & Bottini, 2020; Solnit, 2005; Southworth, 2005); especially with a branch focused on health issues and the characteristics of the built environment that can encourage the active behaviours and soft mobility practices (Gehrke & Clifton, 2017; Saelens & Handy, 2008; Saelens, Sallis, & Frank, 2003) of particular importance to aging Western populations (Colleoni, 2016; Loo & Lam, 2012).

An interviewee claimed the importance of walking: «*Can I add something? The importance of moving by foot! You don't damage anything, you don't hurt anybody, and it's good for you! [...] because yes, I drive everyday, but my mobility is car plus foot, in the city centre of each town I lived in, walking was the one and only mode*» (M., PE)

As it is for the bike, in moving by foot there is a large component of "pleasure of walking" (*I love to walk / I always did / I don't care about the distances*), and still similarly, they both represent ways of moving that allow to know exactly the travel time, in contrast to other modes which are highly affected by traffic and congestion. What is seen as negative of walking is the safety, in general because of the pedestrian being the weakest actor on the road (*«The sidewalk is their paradise corner»* - F2, MI), and also because of the sense of insecurity during the night / dark areas.

What about the 3 revolutions?

Car sharing

The discourse around car sharing service revealed that among the interviewees it was mainly used as a substitute of public transport at night (in the *Car Sharing* node, the words evening/night were mentioned 16 times - Figure 5.22) and for occasional use ("*Knowing that just in case I'm tired, it rains, or whatever... I can take a car2go[78] and go home in 10 minutes. It makes me feel better: having an option B that saves you*" F1, MI). Otherwise most of them claim that during the day it's not convenient, since the time lost in traffic and parking make it too much expensive (*costly/not convenient* mentioned 8 times). Also, it emerged the paradox of offering a car sharing service limited to the municipal border (namely the city area, which is already enough congested by cars and also served by public transport - Figure 5.23) adding useless vehicles where is not needed (and not available in the suburban areas and hinterland).

It may appear, especially in Milan, that car sharing can replace the purchase of a private car *("I don't think I'll buy a car. Because I am aware I can count on car sharing, BlaBlaCar, hitchhiking..."* F1, MI; *"Many friends of mine that don't have a car available, use that to move around"* - C., CT); or that it may encourage the use of public transport ("*One could rely on public transport, then if you have any kind of problem you call Uber and you're ok. I miss Uber a lot!*" M1, RE). On the other hand, as seen in par. 5.1.2 ("*Symptoms of car decline as a desire object?*"), it may re-activate the attractiveness of cars, especially when car sharing services provide nice cars («*Any excuse was valid to use it, mainly because I loved the car!* » C., CT); or additionally, it can be used only for the pure pleasure of bypassing car restrictions («*To park wherever you want, even on reserved parkings*» O., PE; «*To enter restricted traffic areas if you need*» S2, RM).

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[78] Car sharing service.
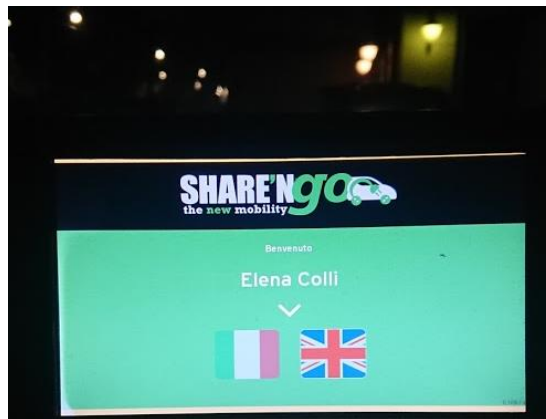
Figure 5.22. Example of use of car sharing at night, Rome. Photo by the author.

Figure 5.23. Example of road congestion in Catania, where car sharing service was tested for a period without success. Photo by the author.

E-cars & e-scooters

The more relevant discussion on e-vehicles took place especially in the Reggio Emilia group (10.61% of the discussion) and partially in Rome as well, focusing more on e-mopeds, to confirm what said above about its moped-dependency.

Going in deep in understanding the attraction factors of e-cars, it emerged how – especially in the suburbs – the main reasons behind the diffused desire to own e-cars, more than for environmental reasons, are: i) a matter of costs in first place, because it would allow them to save on fuel *(«I spend billions in fuel»* - C., RE) and ii) because it's cool – as anticipated in par. 5.1.2 (in "*Symptoms of car decline as a desire object?*") with the "*gorgeous Tesla*" and, finally, iii) for a greenwashing rhetoric, implying that e-cars will solve the problem of automobility (*«I mean... the car pollutes? Amen. That's all I can do. Then,*

of course, when I will be able to afford a hybrid, electric, even oxygen car ok, it's fine! » - J. MI).

To conclude, the protagonists of these recent times: e-scooters. Even in this field, it was clear the emergence of two opposite factions about both the aspects of opportunity/controversy of e-scooters: the curious ones, in favour of this new-entry in cities, which allows to move easily, in intermodality, without sweating or parking problems; and the sceptical ones, sometimes almost resentful, which blame the e-scooter users of being dangerous, claiming it is not a sustainable way of moving (since it substitutes mainly walking and cycling) (Table 5.8).

Table 5.8. E-scooters: motivations behind favourable and sceptical

In favour / curious (22 references)	Sceptical / resentful (23 references)
- They're nice / easy / pleasant - It's fashionable / cool - It allows intermodality (carrying it easily on train, car etc.) - You don't sweat - Can replace driving (for little trips, especially in suburban areas) - No problems of parking	- They drive like crazy, they're dangerous - They substitute mobility by foot or bike / they're not sustainable / not going to solve the sustainability problem - It worsens the situation - They are costly / it's only a temporary business/fashion - There is no regulation

5.3   Travel behaviour change dynamics

5.3.1   Experimentations (good experiences / traumas)

To conclude this rich chapter, some episodes and factors behind travel behaviour changes have been investigated and collected through the analysis of the text. What was recurrent in each focus group session, mentioned by the majority of the people interviewed, was a remarkable experience in other geographical or cultural contexts (see Figure 5.26 to have a view of all the cities/areas mentioned), such as participating to an Erasmus university programme; moving to a city – often abroad – to study or work; moving to a new house; or simply travelling («*Travelling, I actually realised I love to take public transport*» C., CT).

Sometimes it allowed to discover that something was possible, *"feasible"* («*I've done a bike trip in the Netherlands in 2012, it was something I wanted t o do since a long time,*

and it had a certain impact because you see that it is a feasible thing... something that can be done» S., CT); it made them live a "*turning point*" («*I really became intolerant to the car these last years. Also because I've lived for a while in Helsinki for the PhD, so there, let's say, I had a definitive turning point»* - M2, RM).

> *I moved to Pesaro 7 years ago. Before that, I lived in a little town in the hills, and when I arrived in Pesaro the first thing I thought was: ok, now how I move? [...] I thought ok, now I will have to take the bus, something that was unconceivable for me. But then I started to see something that was really insane to me, like totally out of this world, I mean I saw a lot of guys cycling! In my town the bike was used sometimes, but only until you're 10, just in the playground. Instead, here teens actually use it as a means of transport. The thing that amazed me the most was that in summer, I saw groups of like 20 people, all by bike. I was used to see 20 fellas with the moped, not with a bike! [...] Also well-dressed, the girls with the heels... and this thing surprised me, also because when I started to cycle I didn't feel very safe [...] but after a while I basically chose to use exclusively the bike, also because seeing all the dedicated spaces was really an additional incentive to use it.* (B., PE) – (Figure 5.24)

Figure 5.24. Bike presence in Pesaro, already visible the moment you got out from the train at the central station. Photo by the author.

For someone, even going from Catania to Milan could be impressive *(«My father went to Milan and he was super fascinated about how the public transport works, the integrated fare system, and so on»* – C., CT). The contact with realities in which things work can have the power of changing the *perception* of the modes, for instance disrupting the deep-

rooted bad perception of public transport, starting to see its potential as a modern and effective service:

> *It's not been my field of study... It's been more all the trips that I've made abroad. That made me see how a city with good public transport is definitely more advanced.* (M., CT)

> *Let's say Vienna [...] For instance, the bus stop: here it is a messy, half broken yellow pole* [Figure 5.25]. *There, you clearly understand the timetable, the bus arrives on time, clean, tidy... you perceive a different thing.* (S2, RM)
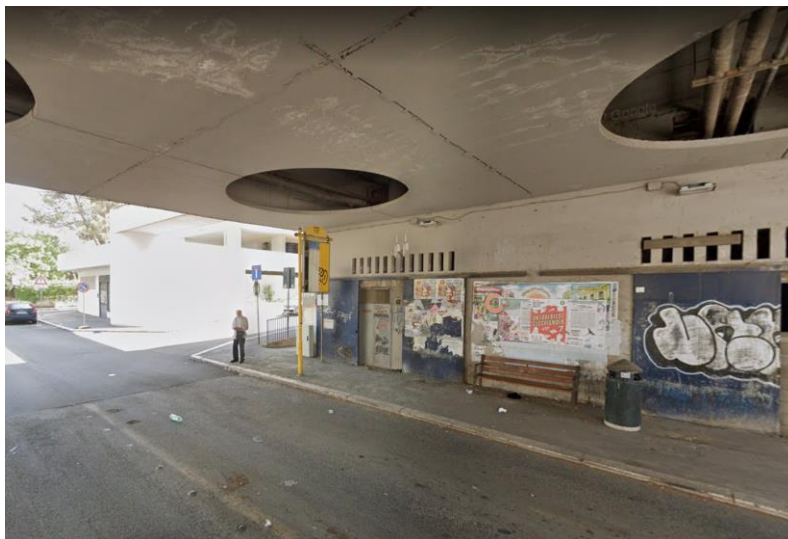
Figure 5.25. Bus stop in the outskirts of Rome. Source: Google Street View, Sept. 2020.

Sometimes the experience in a bigger city makes you realise you can live without the car, and then to maintain the car-less lifestyle also when coming back to the suburbs:

> *Well it started as a 'I don't need it'* [the driving license]. *I used to go around with the moped and public transport, then I moved to a city, where I absolutely had no need of a car. And then I don't know, something came into my mind such as... 'it's not really necessary'. Slowly I realised that you can live without it.* (A., RE, suburb)

Car users, even the most dependent ones, temporarily lose their car-dependency in other contexts: «*I lived two years abroad and I didn't have a car, and I didn't miss it at all*» – I., MI, car user; «*Oh yes, when it started to be less cold, always by bike. And I was super*

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happy!» – L., MI, car user; *«In Bologna I used to move exclusively by foot; same in Padua»* – M., PE, car user.

Figure 5.26. Cities/countries that emerged spontaneously by the people interviewed speaking about positive personal experiences with the local mobility system.

But it is not only travelling and moving in a new place that can have a strong impact. Other times it could simply be a lesson, a course, a fair, a well-done speech: *«Actually this idea* [of the inefficiency of car] *owes its origins to a meeting I did when I was a student...* [...] *I was impressed»* - F1, MI; *«I went to a fair, there was ClearChannel* [responsible of bike sharing in Milan, BikeMi], *we started to chat and... I discovered BikeMi like that. The guy said 'It costs only 29€' '29€ per year??? Then it's stupid not doing it!»* I., MI)

... Some other times it could be the right partner, with the help of the latest app in support of public transport:

> *I remember when I started to say to Elijah* [husband] *'Maybe it's better for you to use the bus, it's more convenient if compared with the mess of us managing a car'. And he was like... He never took a bus! He always used the car because it never even occurred to him. Because he was afraid to get lost, to miss the bus, to take the wrong one, to not find the bus stop... this kind of things. And I said: look, there's this app, super easy... and since then everything worked perfectly fine for him. Easy peasy.* (M1, RE)

But other than good experiences, there are also bad experiences that were sometimes responsible of behaviour change. Like when *I. MI* came back from a good transport experience abroad and was super motivated to do the same in the Milan area moving only with trains and buses from the hinterland, but with the service not being at the same level (*«A bus every 30 minutes is not a service!* [...] *I kept spending time losing buses»* I., MI, suburb), she went back to car.

Or traumatic experiences with the bike that ended up with a total refuse to use that mode again: *«I did have a bike... It was too scary. You can't stay on the sidewalk; but I*

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don't like to stay on the road [...] *So... it lasted a month and then I said goodbye to the bike»* (J., MI, public transport user); «*I abhor two wheels. I had a bike once, and maybe that was the trauma: because I had a bike that I had all set up and everything, and then they stole it»* (M., PE, car user); «*When I was 18 I had an accident on the two wheels... so I always had a bad relationship with the two wheels»* (L., MI, car user); «*When I went to school, back then I lived up in Via C**** [on the top of a hill]. *The bus stopped down in the main road, so I had to do climb up home each time, with the Latin dictionary in my bag! I used to arrive at home all sweaty and super mad with everybody. So my mom decided to start giving me rides to school»* (G., RE, car user).

It could happen that this kind of traumas are overcome thanks to incentives, as it is the case of the student card for the students of the University of Catania, that allowed to give a second chance to public transport, boosted by conveniency and personalised offers:

> *My boyfriend said to me: 'Come on, take the bus!', and I was like: 'Noooo I go by foot!'. But after some time, here they offered free public transport to the students [...] And then I said 'You know what? Let's give it a chance!'. Because I had this "trauma" let's say, of being stuck to others because when I used to go out from school... I really can't say what there was in that bus. But then I said... let's start again and give it a chance. And I have to say... that I was super happy! I mean the first times I kept saying 'That's wonderful I will always take it!' [...] It gives you the chance to discover. Because eventually, I changed my mind. (C., CT)*

... Or because you simply get used to it, but in this case switching from walking/cycling to driving:

> *I liked to cycle, I didn't have the car yet, I didn't have the idea of the car in Catania. I used to be scared by driving in Catania. I was younger and it was terrible. I was a little lamb from the village...But then... you become a wolf among wolves! (S., CT, car user)*

> *I move less because driving makes you lazy. Before the license I didn't care if I had to cross the city with public transport. Now... everything seems closer. So you automatically think that you can reach them by car. (L., MI, car user)*

5.3.2 Environmental concern & the burden of the car dependent Millennial

As a premise, it must be said that – despite the effort in organising the more heterogeneous groups possible while recruiting people for the focus group – among the interviewees there were always, in each area, at least one or two discussion "leaders" with high levels of environmental awareness and arguments, so except few explicit cases[79] many of the other participants were implicitly induced to play the role of the "right" and "good" ones, attentive on the environment, also because, maybe, this is something that society expects from Millennials: «*Actually I realise... it's important to start being aware of this. I mean, also as a Millennial...*» (L., MI, car user).

If compared with their predecessors, there surely is a higher awareness on the consequences of their mobility choices on the environment; both for being more educated to this issue, and for a higher perception of the danger related with the environmental crisis: «*Maybe we suffer more this thing, that's why we care more*» M., CT; «*Yes, also because in these times it's been made more and more manifest to us. While at their time, it wasn't something extreme. Now we feel much more the danger. Or at least, the fact that it is something really close to us*» E2, CT, 20 y.o.)

But what emerged more clearly was the general "sense of guilt", especially from the car users, when speaking about driving and/or owning a car ("the burden of the car dependent Millennial", just to play with Kipling's words[80]). This sense of guilt can be grasped by the frequent use of verbal particles such as *ahimé* (alas): «*I mainly move, alas, by car*» M., CT; «*Alas, I had to take the car*» J., MI; «*Me too, against my better judgment, I move by car*» F., CT. Or in general, the awareness of their action and its consequences, which made them to drive without a light heart: «*I am someone who works on sustainable mobility, I should be an example... instead I always move by car. I am a bad, terrible example*» I., MI.; «*Then you can say I pollute, it's true. I am privileged and spoiled*» M1, RM.

Conversation in Milan:
-   L: *Otherwise I move... yes, by car...*
-   Interviewer*: You don't have to justify yourself*
-   L: *That's the point, sometimes it's like you have to worry about how to justify yourself! [...] you know, I don't really use it every single day... [...] I would really*

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[79] «*If compared with the rest of the group I am the one that... I mean it's not that I don't care about sustainability, but... Now, I can't just say 'Eh my car pollutes...'. I have no other options!*» (J., MI)

[80] Famous poem *The White Man's Burden* written by Rudyard Kipling.

like to start to consider more the bike…[…] to replace all my unnecessary car trips.

What is clear then, is that environmental awareness is more generally interiorised among the Millennial generation if compared with their parents. But this does not automatically means it has a determinant role in their modal choices; it may simply result in keeping the same habits as their predecessors… but, of course, with a stronger *sense of guilt.*

6 Prospects of the transition

The quantitative analysis of the European datasets allowed to better outline the characteristics of the two investigated cohorts in terms of life context and directions, giving the chance to contextualise their characteristics and changes in travel behaviour and verify some of the trends described in literature. Afterwards, the focus groups and the qualitative analysis helped to dig into the mechanisms of these changes, understanding more in deep and with a closer point of view the dynamics underlying choices and behaviours of Millennials and their differences and interactions with the Baby Boomer cohort. It highlighted the importance of their close relation, drawing attention to Millennials as a stand-alone generation, but also on them as heirs to the Baby Boomers' choices and systems of values and habits. Both the investigations together allowed the collection of more information to answer the research questions and fulfil the aim of the study.

With these final chapters we will then merge the initial theoretical framework and research questions with the discussion of the results obtained by the analysis: i) *Are Millennials more sustainable in terms of mobility habits and attitudes?*; ii) *Is this part of a generational change that will persist over time?*

In this chapter the answers to these questions will be illustrated making reference to the literature exposed in the theoretical chapters, taking in consideration the cohort peculiarities and the territorial scale and further enriching the debate on peak car and sustainability transitions. Indeed, the scope is also to answer to the questions of geography of transitions exposed in literature (Hansen & Coenen, 2015): Why do transitions occur in one place and not in another? How do transitions unfold across different geographical contexts? What is the importance and role of relations at different spatial scales for transition processes?

6.1 Are Millennials more sustainable in terms of mobility habits and attitudes?

6.1.1 Good news, bad news

What we see from the data is that *yes*, Millennials seem to have less polluting mobility habits than Baby Boomers: i) they travel less by car (compensating with more public transport, especially train, multimodality and cycling – confirming their openness to the use of non-driving modes of transport), resulting in less daily motorised-km; ii) they have a higher share of people living in dense urban areas, which is connected with less car-dependent lifestyles; ii) they have higher car occupancy rates; iii) they are responding well to the car sharing services with growing subscribers, while among Baby Boomers there are less and no growing subscribers; iv) they are more multimodal and more inclined to change their monomodal habits at certain conditions, especially considering the time and cost of travel, while Baby Boomers are rigid in their "monomodality".

Logistic regression also confirmed that even controlling for territorial and socio-economic conditions, Millennials have less probabilities to be car users for their most frequent trip, if compared with Baby Boomers. Furthermore, a bigger share of them live in more urbanised areas and many are still students, which are both characteristics strongly related with lower car mobility. The regression also confirmed some of the literature findings from De Witte et al. (2013) about the determinants of car use: the positive relation with income and household components (especially the presence of children) and the inverse relation with the level of urbanisation, other than the fact that gender itself do not appear to be determinant.

Nevertheless, there is the other side of the coin. We have seen that yes, there is the presence of a cohort effect, and in general Millennials have more sustainable travel habits, but it is not so powerful as it is told by the *optimistic* narratives about Millennials, supporting the more *sombre* view of Millennials (Delbosc & Ralph, 2017). Furthermore, from 2014 to 2018, they have experienced a downward in multimodality (together with Baby Boomers, coherent with the results of Heinen & Mattioli 2017) and in zero-motorised km, particularly shifting to short motorised trips which are those that can be more easily

replaced with slow modes; the time series of car availability in households showed a relentless and unequivocal rising trend in car ownership in Millennials' households (probably due to their improvement in economic situation and progression in life milestones such as job and family building), reaching the levels of Baby Boomers; and this is also reflected in future buying plans, which see more than a half of Millennials respondents having the plan to buy a car in the next two years. What's more, their solo-driving has increased from 2014 to 2018 reaching Baby Boomers' level. Licensing is growing slow (especially if we consider that the cohort in 2018 is older than in 2014, and they are entering the labour market) but the most cited motivation is unaffordability, with high differences among regions: in PIIGS countries it happens for almost half of non-licensed, showing that lower licensing is more a matter of economic constraint than a matter of choice, while in Western and Peaked we found high shares of non-driving Millennials preferring to use other modes.

Finally, EU-SILC data showed a distinct downward trend in their urbanisation degree. In addition, the qualitative investigation allowed to grasp in many of them the idea of a future in less urban areas, and/or an inevitable automobility once they were/will be out of the student-period, often mentioning the change in time schedule and flexibility, as stated by Elldér (2014): moving from student to full-time employee contributes to the tight budget of discretionary time and to more commuting/business trips characterised by strong temporal and spatial fixity.

In parallel, the trends in Baby Boomers on car use and attitudes, with their maintenance of carbon intensive habits with low attitude to change – even considering their life context changes (retirement, reduction in household members) confirm the predictions of Hjorthol et al. (2010) and Focas and Christidis (2017) about how the generations that are retiring now/in the next decade will most likely keep their driving habits into old age, with probably the highest intensity of all preceding and subsequent generations.

Table 6.1. Are Millennials more sustainable in terms of mobility habits and attitudes?

Millennials have more sustainable habits if compared with Baby Boomers...	...But the trend is experiencing a downward:
• They travel less by car (more PT, multimodality, cycling) • Good response to sharing service • More multimodal and inclined to change their habits under certain conditions • Less probabilities to choose car as main mode, even controlling other socio-territorial variables • More urbanised	• Drop in "0 motorised km", compensated by a rise in short motorised trips • Rise in vehicle ownership (reaching Baby Boomers level) • Rise in solo driving (reaching Baby Boomers level) • Driving licensing rising slowly, but mainly for economic reasons (more than as a choice)

6.2   Is this part of a generational change that will persist over time?

As pointed out by Focas & Christidis (2017), the current debate on Millennials' behaviour is on (i) how permanent this reversal of past trends is, (ii) how far is it related to purely economic factors, and (iii) what may be other underlying causes. The photography of the habits, confronted with the changes over time and the contextualisation in the respective socio-economic situations of the cohorts analysed, are already giving some answers to these questions. Millennials' less attachment to cars tends to weaken as their socio-economic status increases, supporting the theory of their more sustainable behaviour predominantly driven by economic factors, following the general trend in Europe which sees global transport emissions picking up as economic growth resumed (Crozet, 2019). These trends of picking-up with car use, combined with their transformations on socio-economic status and family context – entrance in the labour force and being on their way to build families and moving to less urbanised areas, all linked with higher car use (Figure 6.1) – suggest that their less polluting habits could shrink over time, especially in PIIGS and Eastern countries (which showed higher attachment to car culture, with higher increases in car use – Figure 4.35 – and higher risks of perpetuating their parents' habits, with longer permanence at parents' house and lower shares of people living alone – Table 4.7). On the other hand, Baby Boomers are static on many levels: they keep living in less urbanised areas and are keeping their driving habits even considering their transformations in occupation status (retirement) and household type (from families with multiple members to couples without children); moreover, their share of zero-motorised km has actually fallen

and the distance travelled remained unvaried, even if they travel less regularly. There is low probability that they will change their habits (as seen also in the qualitative analysis), showing a general stagnation in distance, occupancy rates, vehicles per capita.
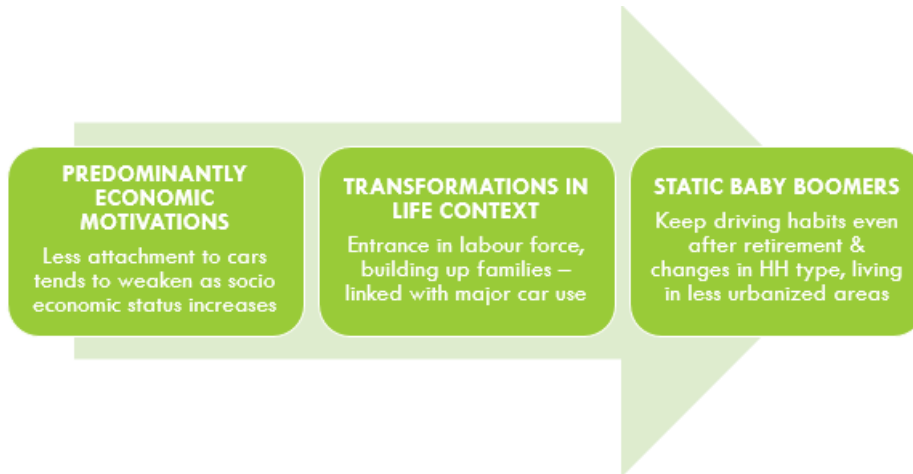
Figure 6.1. Will the generational change persist over time?

Furthermore, among Millennials we see a constant decline in those who do not have a car because of unaffordability, which became over years a secondary reason to not own a car if compared with "other reasons", which is now represented by a niche group (12% in 2018). It is in fact worth of note that during the focus group sessions the issue of "unaffordability" did not emerge strongly (except for a general reference on how their parents were more able to afford it at their age)[81]. This may suggest few things: i) the direct relation among car purchase and age: at some point, the Millennials who can afford it, eventually buy a car (often paying by instalments), or will soon buy it; iii) the fact that unaffordability as a motivation to not owning a car has been surpassed by other reasons, signals the persistence of a niche, which is more large among Millennials than Baby Boomers, that do not own a car as a choice or for other reasons, and that won't probably buy it in the next years.

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[81] To explain the lack of the unaffordability issue among the focus groups, two things have to be considered: i) the sessions were public, which could have inhibited people to speak about personal economic problems among other people; ii) many of the interviewed were still living with their parents, having the possibility to use their car(s), or even having their partial/total economic support for buying a car.

6.2.1 To peak or not to peak?

The general increase in car use, though, follows different paces and rules. Whether you are a Baby Boomer or a Millennial, there are regional and local trends that influence the paths regarding car use and dependency, since each European region has its own cultural and socio-economic conditions, and so do specific cities, metropolitan areas and suburban territories. At a European level, Western and Peaked countries are more or less stable in their car attachment regardless of economic fluctuations, even if their car use is moderately growing, participating in the general increase in car use (with vehicle ownership growing at the same pace as other clusters). Whereas car attachment seems to be somewhat embedded in PIIGS countries even among Millennials, which are catching up pre-crisis levels at a sustained pace. So, if at the individual level it clearly appears a connection between car use and socio-economic status – which remains true in Millennials as well as in previous generations – with a wider point of view we can also see that the most stable economies have larger shares of people preferring slow modes.

Resuming the hypothesis of peak car from the first chapter (par.1.3.2), with a general view on the prospects of the transition in the European territory, the contribution of this research is that Europe seems far from the third hypothesis of Goodwin (2012), which was "*the passing of a turning point followed by long-term decline*". The role of young people in car peak has been surely determinant, as Kuhnimof et al. claimed (2013), but now with their catching-up in car use and the persistence in intense mobility habits of Baby Boomers, it is more realistic to say that especially in PIIGS countries "*they are still in long-term growth with only temporary interruptions due to economic circumstances*" (1st hypothesis), while in Western and Peaked "*they have reached their peak and will show little or no further growth*" (2nd hypothesis).

As a matter of fact, data in this research showed that car is and remains the first mode, and that its overall use in Europe is rising. The assumptions made by Focas & Christidis in 2017 are confirmed: "*the use of the car may rebound when there is a recovery in economic conditions in the PIIGS and Eastern growth clusters* [...] *it will remain stable in the Western stable group and marginally fall for the Western peak group. These trends suggest that car ownership levels at EU level are expected to grow moderately in the future*" (pag. 544) – even if, as a matter of fact, car use/ownership did not properly fall for the Peaked

group. Regarding the Eastern countries, which are the main contributors to this growth (together with PIIGS population they make half of the EU28 population - 46%, cfr. par. 4.3 - meaning an overall high environmental impact), it seems too soon to understand what their path will be once they will reach the Western levels.

A central role is and will be played by the residential choice. In fact, as highlighted by the scheme of Mattioli, Anable, & Vrotsou (2016) cited in par. 1.3.1, residential choice (long term choice) is what determines medium and short term choices (car purchase; daily travel habits), with long term effects. The regression analysis, together with the qualitative study, showed that what really makes the difference in choosing or not the car as the main mode is not much the fact of belonging to a cohort, but the residential location (both urban/rural and regional cultural/economic context), and the "status" (income level; being a student). According with the data, car use rises in all territorial contexts, but the share of Millennial car users is nearly double in rural areas if compared with highly urbanised areas (65% versus 34% in 2018, cfr. par. 4.2.1). The general decline in car ownership and use is then linked to the fact – other than the economic reasons exposed above – that more Millennials are living in densely urbanised areas in which is more easy to live without a car; but will it be a long term situation? As the parents proverbially say to their teenage children when they start to dress strange or acting rebellious, "it's only a phase". Will it be?

The prospects of a generalised "metropolitan generation" are fading, supported by: i) the decline in Millennials living in bigger cities; ii) the persistence of the "suburban" desire in a portion of them (especially the older ones), and/or the vision of their life in bigger cities as only temporary (the idea of go / coming back to the suburbs when it will come the time of building a family) increasing the risk of the perpetration of car dependent lifestyles also in the Millennial generation, even if far more later than the Baby Boomers. This corroborates the theories that the more sustainable habits and lifestyles are only temporary and not part of a proper transition, in the words of Logan (2014): as the economy improves and the Millennials move through various phases of their lives, their housing preferences start to mirror those of their predecessors, especially when they enter their 30s, as also stated by Garikapati et al. (2016).

Although, there is a series of positive remarks worth of note:

1. The fact that many Millennials currently live or have lived a period in bigger cities, moving in a more sustainable way, is somehow positive even if they eventually end up living a car dependent life in the suburbs. Because at any rate, the postponement alters the total level of demand, in accordance with Focas & Christidis (2017) and Garikapati et al. (2016): for if one age group now makes fewer trips than it did before, it lowers the overall level of demand and has tangible effects in terms of reduced distance travelled, energy consumption, and emissions.

2. Which is directly linked to the fact that many of them have experienced (living or travelling in bigger or better served cities) a car-free lifestyle, discovering that it could be a possible, pleasant and desirable way to live. This increases the possibilities of an impact on their future behavioural choices, still in accordance with Focas & Christidis (2017) and Chatterjee et al. (2018), when saying that some who embrace a carless lifestyle and postpone using the car may end up abandoning car driving.

3. Furthermore, results of the qualitative analysis are coherent with Ortar & Vincent-Geslin (2017): even though the car remains ever-present, its use has become more pragmatic, especially among the younger Millennials. It may be the result of a different kind of socialisation with the car, which is no longer the status symbol that it used to represent, dominant and taken for granted, but as seen in the previous chapter, something more pragmatic (regarding both driving and getting the license: 'just in case'; 'because I have to'...) and surely more conflictual (bad reactions related to traffic and parking; whish of 'getting rid of it', the *sense of guilt*), which might play a role in the de-normalisation of car use in the current and future generations.

As a final remark, the higher environmental impact of Baby Boomers' driving habits will probably reach a peak in the next years and then decline as soon as they will be too old to drive, considering also the rise in physical limitations showed by the European data.

These considerations eventually confirm the importance of socio-demographic changes in determining travel demand and traffic, as stated by Metz (2012).

6.2.2 Millennials' peculiarities in the growing up context and future implications

The qualitative analysis, in particular, allowed to identify some peculiarities of the Millennial cohort, especially regarding the growing up context. The experiences of those who spoke about their familiarity with public transport since childhood / adolescence, confirmed both the hypothesis of Miller & Yar (2019), which described Millennials as the first generation raised by women who entered professions in big numbers, affecting their perception of autonomy and mobility needs, and the evidences of Smart & Klein (2018), which shows how being more exposed to the use of public transport if compared to previous generations, makes them more inclined to shape their future habits in a less car-dependent way.

In contrast, for those who have lived their whole lives in a transport system that relies almost entirely on the car (as the ones living in suburban areas and which have never or rarely experienced a different way of moving), it is no surprise if they use the car as soon as the economic circumstances allow it, as stated by Delbosc et al. (2019), even considering their larger literacy on the environmental risks and education if compared with Baby Boomers.

It is then reasonable to think that if new generations keep living in the same cultural and contextual conditions of their parents, no matter if they are generation X, Y or Z, they will likely keep and perpetuate their mobility habits, especially without incisive changes in the supply of sustainable mobility education and infrastructures. In this case, without a variation on the values, imaginary and symbols related to car, the cohort effect would be substantially lower.

Also, there are some interesting implications regarding the change in mobility patterns of men and women. The gender gap in mobility habits and capital was surely more evident in the Baby Boomer generation (not to mention the previous cohort, the Silent generation), as also emerged during the focus group sessions. Nevertheless, this means two things: on one hand, it is a positive sign of the decline of the masculine domination in car driving, owning and representations. But on the other hand, the wider access of women to employment, together with their higher responsibility of the mobility of the other family members, resulted in an overall impact on female mobility pattern, as stated by Marolda

(2019): they are often involved in a complex spatial-time organisation in their work-life balance, which prevents or restrict to them the use of public transport. In fact, due to the rise in car use, independent travel by children has declined in recent decades (Pooley, Turnbull, & Adams, 2005). As a result, women are now driving more, sometimes even more than men, being more affected by car dependence and contributing to the increase in the overall car use. Which means, in turn, that working on gender equality, especially with regard to work-life balance, can also have consequences on the environmental impact and viceversa. As suggested again by Marolda (2019), this can be facilitated involving women in planning and design of transport means and systems, enabling them to express their concerns and work together on appropriate solutions for a more equal transport system. Making more easy and safe for children and teenagers to use public transport and the bicycle, increasing their own independence, may have positive consequences on work-life balance, especially for women. This was also proved by a research (Garrard, Handy, & Dill, 2012) which shows that higher cycling levels tend to be of great benefit especially for women: since they are still taking care of most of childrens' and older adults' mobility in families, they gain more free time if the children and elderly can undertake journeys by bike independently and do not need a lift by car.

7 Conclusions

The final outcome of this research is that the overall European car use is actually increasing, despite all the hopes regarding the younger generations. Car is and remains the first choice. Car users increased in both cohorts and in all regional clusters and degrees of urbanisation, showing that a transition towards a less automobile system seems more challenging than expected. Although, this increase in car use follows different paces and rules, which are only in little part dependent on cohort effects, but rather on territorial influences, in particular with a substantial contribution in driving rise from i) Eastern and PIIGS cluster, which together make nearly half of the EU28 population; and ii) from the large part of the population living in suburban car dependent contexts.

It is then really necessary to debunk the myth of the Millennials being more sustainable for the simple fact of being Millennials. There is surely a difference in their driving behaviour and car purchase habits if compared with their predecessors, and a change in the perception of car and other modes due to their higher exposure to environmental education and policies and ICTs/infrastrucure improvements (both for public transport and cycling);

but this alone doesn't mean it is homogeneous in all the cohort members and/or that they will keep their more sustainable habits in the long term. There is still a large part of the suburban Millennials, and in parallel an entire part of Europe which is running to catch up with the Western countries motorisation rates, in which the delays in car use and purchase are mainly dectated by unstable economic conditions, plus the general postponement of crucial lifesteps such as first job and going out from parents' house. In this category, the main difference with the Baby Boomers is the higher awareness of their polluting habits (which often causes a general *sense of guilt*). In fact, environmental awareness alone is not enough to cause behaviour change; it can be determinant for a few (the example of the only car-less person in the focus group session of Reggio Emilia) but it is not an engine of change for massive shifts, as it demonstrates the fact that the sense of guilt is not enough to prevent Millennials to eventually buy and use cars to maintain a decent life standard in car dependent places, or to keep their conscience clean with the purchase of e-cars.

What causes change behaviour, following the results of the qualitative analysis, is especially the direct experience with effective, well-working alternatives to car, which make people realise the possibility of something better than the current condition (car dependency), as the popular quotation of the futurist Richard Buckminster Fuller reminds: "*You never change anything by fighting the existing reality. To change something, build a new model that makes the existing model obsolete*"[82]. But for making it an equal and long lasting change, it has to be possible *everywhere* (in the "province", in the suburbs, in cities with uncontrolled urban expansion like Rome) and *always* (even after a child, or a strict-scheduled new job).

7.1   Car (in)dependencies and the urban élite

As we have seen, Millennials are not always – and not for good – opting for dense urban environments that are less car-dependent, in contrast to what many scholars attributed to the causes of "peak car" (cfr. par. 2.3). Although, they demonstrated – both with quantitative and qualitative data – to be more open to the use of non-driving modes of transport and having in general a greater attraction to less driving-intensive lifestyles if compared to Baby Boomers (Figueroa et al., 2014; Headicar, 2013; Newman & Kenworthy, 2006).

What is clear is how incisive is the role of the residential location: being it the degree of urbanisation, living in the city centre or outskirts, or in a particular European region. This

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[82] The Buckminster Fuller Institute Challenge archive: https://www.bfi.org/challenge

factor is in fact strictly related with the other determining factors related with car use and choice (occupation; income): university students come in contact with bigger cities (sometimes only as city users, some other times moving there, and eventually ending up getting used to the urban and carless lifestyle) experiencing modes alternative to car. In turn, being more years in education implies the postponement of economic independency, and for those living in the suburbs and car dependent places this could mean prolonging the stay at the parents' house, using their cars and postponing car purchase.

The qualitative section highlighted in particular the role of "living with parents" in explaining high levels of car dependence in Italy, which can be possibly applied in Mediterranean countries more broadly to explain their persistently high levels of car use among Millennials, if compared with other countries (cfr. par. 4.3). Many findings point to the role of "living with parents" in boosting car ownership and use, including: extended access to parents' cars; parents insisting on their kids to buy cars (or directly buying them); reduced chances to live in non-car dependent environments (dense urban areas) and situations (single-person household), with knock-on effects in terms of (lack) of socialisation to alternative modes and multimodality.

It is then more a matter of the opportunity to live and experience car independent places (plus a higher environmental awareness and education), which is larger and more diffused among Millennials, that makes them more *car independent people* as a cohort.

The qualitative analysis showed that it was rare to find the traits of car dependent *people* among the Millnnial interviewees, which emerged only in the discourses regarding their parents (which often consider normal and natural the use of car as the only acceptable mode of transport, arguing with their sons and daughters for their different choices) or in occasion of Millennial car owners which do not want to switch or go back to other modes: being it for laziness; because they're too afraid/reluctant to cycle or use the public transport even having the opportunity (see "Car (in)dependency scheme" in Figure 7.1, quadrant 3 – Q3); or because they don't/barely have the opportunity (Q2).

Many other Millennials can be labelled as *car independent people living in car dependent places* [Q1] : all the ones living in less dense areas, suburbs or outskirts, or cities with no decent alternative to car, who actually often desire a life without a car, and would be happy to "get rid of it", but have no possibilities (sometimes stuck in those places because of the legacy of their parents, since there they have family, friends, the possibility of a cheap house etc.), and which have to rely on a car, carrying on a "sense of guilt", or sometimes trying to rely on other modes but with some difficulties and limitations.

Finally, many others can be inserted in Q4: the ones living in dense urban areas with more transport services, having the opportunity to *live the dream* of a carless life and the possibility to rely on car sharing services for the car dependent trips (such as night/early morning trips; carry heavy things; reach car dependent places). Important to note, though, that this often represents a more or less temporary phase, as the data indicate a decline in urbanisation rates of Millennials and the persistence of an idea of a *suburban life* when it comes the time to build a family and raise kids.
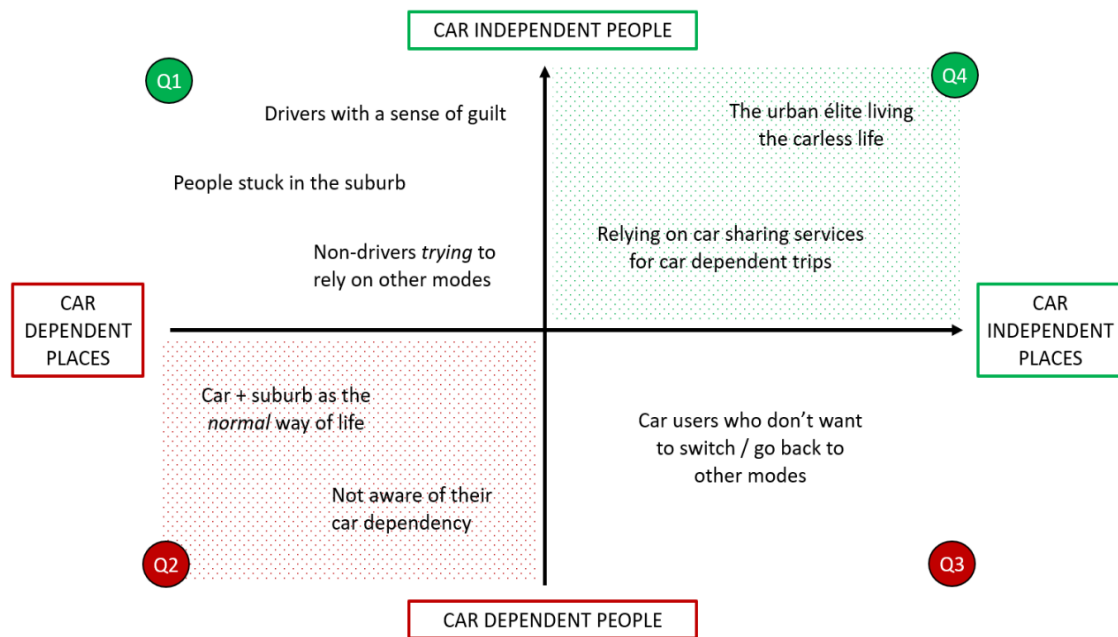
Figure 7.1. Car (in)dependency scheme.

The main difference between Baby Boomers and Millennials, using this scheme, is that the first have a larger share of people who occupy the lower part of the scheme (*car dependent people*), being in Q2 and sometimes Q3; while the second have larger shares in the upper part (*car independent people*), Q1 and Q4. This demonstrates the power of the cohort effect (set of values, education, growing up context) in evaluating current and future mobility attitudes, which determines the fact of being or not a car dependent *person*; but what it teaches is also that without working on *places*, the history will repeat itself: sooner or later, the majority will end up choosing the car (because in *car dependent places* there is no choice; and because as long as Millennials age and start building families, they might choose to go outside the chaotic and expensive city – probably switching from Q4 to Q1).

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Even if, following the logic of An, Heinen, & Watling (2021), this "temporary urban élite" might become part of an "age effect" that most people of the next generations will live, determining a general massive postponement of driving (and a consequent saving on car emissions).

Let's focus, then, on the narrative of the *urban élite*. Why the word "élite"? In the report "The big European sort? The diverging fortunes of Europe's regions" (Odendahl, Springford, Johnson, & Murray, 2019)[83], the authors say that after the decline of industrial production, European post-industrial cities started to attract a population which was younger, more highly educated and richer than the ones who live in less successful cities and towns. "Less successful places are losing people, especially in countries with ageing demographics" (*ivi*, pagg. 2,3), with the consequence of a damaging divide between ageing towns and rural areas and the flourishing mega-cities, with "frustration at relative economic decline in poorer regions and grievance about metropolitan élites" (*ibidem*). The word "élite", referred to the young, wealthier and more educated urban class, is also in the already cited paper of Kuipers (2013), which speaks about the *cosmopolitan élite*, a group of people that behaves similarly across nations, emulating the standards and practices of the transnational field, while most less educated or less well off are nationally and locally oriented (Weenink, 2008), with a globalization process that reinforces the growing social distance between groups. Paradoxically, "the international symbol of this cosmopolitan, green, egalitarian, urban class is [...] ...the bicycle" (Kuipers, 2013: 31).

This kind of tension became especially visible with the emergence of the recent social mobilizations related to social justice and climate mitigation policies: the *gilet jaunes* in the peripheric areas of France and the ecological movements carried on mainly by young people in the city centers (Fridays for Future, Extinction Rebellion). The social/geographical composition of the movements reflects the different perspectives and priorities of the generations involved[84]: "the end of the month" and "the end of the world" (to stole the words from Martin & Islar, 2021). Despite their differences, they have in common the claim for more just policies for climate change, which should not be payed by the citizens, but with a structural change, especially targeting the big polluters. *Gilet jaunes* in particular

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[83] Commented by Julian Coman in an article on The Guardian: "How the megacities of Europe stole a continent's wealth" in 10/11/2019, available at
https://www.theguardian.com/cities/2019/nov/10/how-europes-cities-stole-continents-wealth
[84] We can say a large part of Yellow Vest is composed by Baby Boomers (30% is aged 50-64), coming from the lower-middle class (28% working class, 21% employees) mostly living in rural areas or little towns (48%) (Institut Montaigne, 2019).

emerged in opposition to a series of policies limiting the mobility of car users (increasing carbon tax and diesel price; lowering speed limits)(Forum Vies Mobiles, 2020). Mitigation policies such as fuel taxes rise contrast with the fact that large sectors of the population are in a situation of car dependence and that car use has become essential for need satisfaction, as it provides, for example, for many people access to employment, raising issues of fairness and equality (Brand-Correa, Mattioli, Lamb, & Steinberger, 2020).

It is then necessary to question and analyse the "élitisation" of metropolies and urbanites. Cities are places that can offer a broad range of health, educational, and other social and cultural services as well as transport, communication, energy and sanitation networks at a much lower cost than in sparsely-populated regions (Eurostat, 2016): the close proximity of people, businesses and services provides opportunities for a more efficient use of resources, a higher use of public transport, and more people living in flats and multi-family houses, which generally require less heating per person (*ivi*). As already remarked in the first chapter, cities can be viewed as both the cause and the solution to many of today's economic, social and environmental challenges. But a process of wealth accumulation in few advanced cities (Brenner & Schmid, 2015; Harvey, 1989) have left the majority trailing behind (European Commission, 2013a). The goal has to be to make sure that the wealth and resources that they produce do not just stay in cities, but also dispersed outside their gates, in order to subvert the ongoing polarisation which is feeding the narrative of the *environmental-friendly young urban élite* against the *polluting, old, car-dependent dwellers of suburbs and rural areas.*

As a matter of fact, cities and urban areas are only a little part of the reality. In the European Union, due to a growing number of suburban and peri-urban developments, the urban areas account for 22.5% of EU total area (Eurostat, 2016), and the share of areas accounted for cities is considerably lower (3.9%). In many cities, people have tended to move out of inner cities to suburban and peri-urban areas on the outskirts of existing metropolitan regions, encouraged by the increase in motorisation, improvements to road networks and public transport links, aspirations for a better quality of life. The challenge would be to stop this polarisation and let the "Q4" be something possible for everyone and everywhere, not only "the urban élite".

7.2   Policies: where to focus?

There are many challenges that have emerged and been discussed along this text. To pick up the expected outcome declared on the methodology chapter, the research intention

was to provide more elements to understand the trends regarding Millennials and the future implications for the environment, obtaining as a result more evidences on how to shape more targeted urban policies and well-informed planning for a transition towards more sustainable transport system.

What seen in the differences between the two cohorts, in fact, is that people are motivated by different factors (e.g. on multimodality), have different perceptions on the pro and cons of each mode (the opportunity to drink one more beer when going out, or to have the certainty of a safe way to come back at night, is something very important for Millennials; while for instance the accessibility of public transport for people with disabilities is more important for Baby Boomers) and for these reasons they are affected in different ways by policies (Anable, 2005). The method of word frequency has proven useful to analyse Millennials' imaginary around the main ways of moving, and can be proposed as a useful tool to catch, represent and see at a glance the push and pull factors of each mode, to work on incentives and disincentives, to look how car pros (comfort, safety, car dependent trips...) can be compensated by other modes: studies on the acceptability of various transport policy measures have revealed that people are more likely to accept positive (pull) measures than negative (push) measures (Schade & Schlag, 2003; Steg & Vlek, 1997). As Banister (2008) states, the intention is not to prohibit the use of the car ("*fighting the existing reality*", to take up the quotation from Fuller); the intention is to design cities of such quality and at a suitable scale that people would not need to have a car ("*...build a new model that makes the existing model obsolete*").

To realise this, it is also important to put emphasis on the fact that individual change is welcome and it is surely of scientific interest to better understand the ongoing processes and where to act; but what is needed for a proper transition is political and structural change. This is also stressed by Mattioli, Roberts, Steinberger, & Brown (2020), which note how car dependence research often exposes the difficulty of moving away from a car-dominated, high-carbon transport system, but neglects the political-economic factors underpinning car-dependent societies, such as the prominent role of the automotive industry, the persistent provision of car infrastructure or support of urban sprawl. Transitions are not linear processes but entail multiple interdependent developments which are the result of co-evolution of several elements such as technologies, markets, user practices, cultural meanings, infrastructures, policies (Köhler et al., 2019).

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7.2.1   **Room for improvement**

As this research has showed, looking at Millennials behaviour trends in recent years, losing their "sustainable generation" label, can be discouraging. But still, there are elements that prove that there is still room for improvement in younger generations. Millennials have shown to be dynamic and still in the middle of a transformation/changing period of their lives, other than responding well to policies and transport investments, for instance train and bike infrastructures, and car sharing services.

They remain more urban than their predecessors, even considering their decline in the degree of urbanisation. They have higher levels of education, and a large part still in education, which is particularly important considering the relevance of the university phase as a boost for experiences in other cities and contexts, which was less common for Baby Boomers.

Studies have suggested that youth is an impressionable period when individuals are highly susceptible to the influence of social context, and on this basis, their worldviews, values, and beliefs can be substantially shaped (Down & Wilson, 2013; Wray-Lake, Flanagan, & Osgood, 2010). For instance, this was visible in the Baby Boomers' system of values and socialisation to cars, shaped by their distinctive early life conditions and formative experience (An et al., 2021) that built on their "cohort effect"; but also on the Millennial cohort, who lived a wider media coverage of the environmental crisis, higher environmental education, the emergence of new status symbols, which produced its effects. From the little daily habits (the sense of guilt while driving) to large scale impacts[85]. For instance, it is possible that being familiar with new mobility services since young age (long distance carpooling, car sharing, car rentals between individuals, etc.) will allow them to keep these habits later in life and thus be less dependent on owning a vehicle than previous generations.

All good reasons to invest in education, starting from the very first phases: in school as well as in the domestic sphere. The growing up context, namely the legacy that the parents' choices and values have on their children, has proved to be determinant, corroborating what said by Döring, Kroesen, & Holz-Rau (2019) about the indirect parental socialization

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[85] As stated by Gianni Silvestrini, director of Kyoto Club – non-profit organisation engaged in reaching the greenhouse gas reduction targets set by the Kyoto Protocol – the persistence of the "Friday for Future" manifestations favoured the European Union to provide higher targets for greenhouse gas emission cuts, as the leader of the European Commission Ursula von der Leyen herself stated. Press release of 9/10/2020 available at: https://www.kyotoclub.org/docs/cs_kc_091020.pdf

effects on mobility behaviour via residential location and attitude on car availability and use. And so does the domestic knowledge transmission, from parents to children, but also in reverse, as seen with the conflictual moments between Millennials and their Baby Boomer parents, that sometimes may result in a learning process with positive results, supporting the approach of "linked lives" (cfr. par. 2.1) which states how intergenerational influences – such as from parent to child and vice versa – can be highly influential. What should not be undervalued is in fact the educational role that Millennials can have for their parents. It can have many potentialities, for example considering the higher share of parents going to visit their Millennial sons and daughters living in cities, or even abroad, making them more familiar with their different lifestyles and way of moving (activating virtuous circles). It is more probable that Baby Boomers will listen and trust their own offspring rather than the political institutions when it's about changing habits.

The fact that Millennials are still young, with no rigid and fossilised habits, and most of them still in the limbo between education and work, can be exploited to act with targeted policies which can be determinant to give a direction to their long term choices, and for preventing them to perpetuate the habits and attitudes of their parents (in turn, perpetuating the vicious circle in the succeeding generations). Working timely on economic factors such as competitiveness and attractiveness of alternative modes (with the help of investigations on push and pull factors as said above) can still be a chance before they got stuck in car-dependence as their predecessors. Farhad Manjoo, in a successful article on the New York Times titled "I've Seen a Future Without Cars, and It's Amazing"[86], writes that "*Buses are slow, bicycles are dangerous [...] only because you're imagining these other ways of getting around as they exist today, in the world of cars*". That's why working on imaginaries and opening the view of people on other possible mobility systems can be pivotal in determining different behaviour directions.

Finally, working on the still existing gaps in gender equality, especially with regard to work-life balance, can have substantial consequences on the improvement towards a more sustainable mobility system, and viceversa: making more easy and safe for children and teenagers to use public transport and the bicycle, increasing their independence (which was often cited as the main push factor to get driving license), will have positive consequences on work-life balance of their parents (especially mothers).

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[86] 9/7/2020, available at: https://www.nytimes.com/2020/07/09/opinion/sunday/ban-cars-manhattan-cities.html?

7.2.2 Working on *places* to avoid an upcoming "Ok Millennial"

In order to populate the category of car independent *people* in car independent *places* (Q4), in parallel with interventions to prevent the insurgence of car dependent *people* (Q2 and Q3) acting on education, domestic knowledge transfer, work-life balance etc., there is the need to work on *places*:

- On the *car dependency of suburban areas*: cycling infrastructure alone would not be enough as they only cover short distances; a good combination of train station access and public transport – accessible and intelligible also for elderly people – integrated in a cycling network is required to be able to compete with the car (Kager & Harms, 2017) (moving people from Q1 to Q4);

- On the *attractiveness of cities and urban areas for the family-building process*, making them more child-friendly places to raise kids, ensuring accessibility to green areas and good quality of life (making people stay in Q4 for the long term, even highly urbanised areas).. These elements represented the pull factors that brought and still bring people to the suburbs. As stated by Zhang (2014), in fact, effective land use and transportation policies should be designed with policies which affect individual life choices also in other domains (always with an eye on *mobility biographies*). It is then necessary to avoid a postponed re-proposal of the "suburbanisation" lived by the Baby Boomers and stop the vicious circle before we will hear at some point the "Zoomers"[87] starting to say: "Ok Millennial"[88].

Furthermore, in dense urban areas, where the presence of car sharing services is more diffused, the potentiality of these services as substitutes of a private car can be boosted to avoid car purchase. In fact, as explained in par. 1.3.3, it appears more effective to influence car purchase rather than reducing car use, since car ownership is a precursor both to trip generation and mode choice (Goetzke & Weinberger, 2012b), as demonstrated by the few car dependent Millennials in car independent places, which became frequent drivers the moment they bought a car.

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[87] Generation Z, the cohort next to the Millennials, also known as "GenZ" or also "Zoomers", a term which went viral on the internet as a clear reference (and opposition) to "Boomers".
[88] Reference to the "Ok Boomer" explained in the introduction of chapter 4.

Finally, there are some efforts that could be done in policy languages to subvert the narrative of the "urban élite", taking the suggestions coming from the world of ecolinguistic (Caimotto, 2020). Classism has a strong connection with mobility-related issues, as revealed by Furness (2010), who highlights that "*one of the cheapest forms of transportation on the planet is construed as elitist, whereas one of the most expensive and resource-intensive technologies is considered populist*" (2010: 135). When policies and promotional material inviting people to cycle or walk more frame drivers negatively, implicitly or explicitly blaming them for the environmental crisis, the effect is understandably a negative reaction by drivers, which feeds the conflict. More could be done in terms of conveying new worldviews avoiding the employment of rigid categories, thus avoiding the pitfall of the "us versus them" narrative[89] (Caimotto, 2020).

7.3   Limitations, further developments and original contribution

7.3.1   Limitations and further developments

As already mentioned in the methodology chapter, limitations of this study can be identified particularly in three points.

First, i) the use of the variable "most frequent trip" as the proxy for travel habits, which suggests the need to implement a more complete and detailed survey for mobility habits in Europe. Furthermore, for what concerns the implication in terms of GHG emissions, it is limitative since the "most frequent trip" is not necessarily the most polluting one (for example with reference to frequent short shopping trips, as stressed by Mattioli & Anable, 2017). What's more, the research lacks in the extension both in quantitative and qualitative terms of the investigation on "less frequent" trip, such as long distance travel and air travel, which can account for a large share of transport emissions, being a game changer for the overall environmental impact of the generation analysed. The human desire for more interaction with the world – as we have seen, also boosted by experiences abroad

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[89] To look into a good example, see the the campaign released by Transport for London in 2019 "Walk. Cycle. Discover" https://londonblog.tfl.gov.uk/2020/07/03/walking-cycling/ - well explained by Caimotto (2020) in chapter 5 (p.75).

in younger generations for study/work/leisure, which also brings a "globalisation" of family and friendship networks, as well as working environments – seems to translate into a choice for ever faster means of transport, of which the exploding air travel market is the ultimate outcome (Bleijenberg, 2003). It is true that my focus was mainly around car dependence and the transition away from the automobility system, but as stated by Boussauw & Vanoutrive (2017:17), "*Let it be clear that anyone who talks about climate change and transport without talking about aviation misses an important dimension*".

Secondly, ii) the limited period of time for the study of mobility habits (comparison of 2014 and 2018), implying the need for a proper longitudinal study on a larger period of time to better define mobility trends. Thirdly, iii) the lack of the Baby Boomers' counterpart for the focus group analysis, to make comparisons with the imaginaries emerged – as well as it would have been useful to make the two cohorts argue on these topics together, and in other European territories (including rural areas). All these points represent good inputs fur further research in quantitative and qualitative terms.

Furthermore, the research offered some interesting insights that would be worth of further exploration:

- The future perspectives of Millennials for *long-term residential choices and priorities in family-building*, given its crucial importance to determine travel behaviour trajectories and environmental impact;

- The relationship between a longer stay at parents' house and (de)motorisation, since this phenomenon is not only a prerogative of Mediterranean countries, but it affects in general Australia, North America and Europe (cfr. par. 2.3), with recent increasing rates in UK & USA (Butler, 2020; Fry, Passel, & Cohn, 2020);

- The role of the Baby Boomer parents in transmitting systems of values, attitudes and habits related to *driving as a legacy,* embracing the approach of "linked lives";

- Similarly, the dynamics and potentialities of the *domestic knowledge transfer* between Millennials and their Baby Boomer parents, exploring the potentialities of this kind of education to promote a shift away from their car dependence, preventing the risks of isolation, immobility and high levels of dependency the

moment they will have to give up driving, as Berg, Levin, Abramsson, & Hagberg, (2015) pointed out;

- The *educational role of experiences* abroad / in bigger cities / contact with other cultures and territorial contexts, often linked with the more diffused academic paths followed by Millennials, which represent first-generation students[90] in many families (and how to improve a more equal distribution of these opportunities to all students, considering the different levels of accessibility to higher education and experiences abroad, see Argentin, Gerosa, Romito, & Uberti, 2020; Romito, 2021);

- Investigate more in deep the link between *progresses in ICTs and car use decline*, which emerged only superficially during the qualitative research, but with interesting hints on the role of internet and technology, such as the higher attractiveness of public transport which allows to do other things while travelling like working or listening to podcasts etc; or the role of efficient and user friendly mobile applications that make more easy and efficient the use of public transport;

- To go deep in the *role of car sharing services* to understand their impact on car usage, purchase and desire, since sometimes it proved to represent a real alternative to a private car, while other times it revealed to be a competitor of public transport or slow modes, and had a role in reviving car attraction;

Finally, as this study accepted the call of Antal, Mattioli & Rattle (2020) to bring more attention to negative trends in the field of transition research, further investigations are needed to understand how unsustainable trends emerge, who drives them, and how research could help to curtail harmful socio-technological changes before they become entrenched.

7.3.2   Original contribution

Nevertheless, even considering its limits and lack of further investigations, the study remains worth of attention, as it highlights some clear EU-wide trends among Millennials and geographical areas, which suggest that there are ongoing rapid changes which need to

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[90] University/college students whose parents did not obtain a university/college degree (Spiegler & Bednarek, 2013). In 2012, the share of first-generation students – comparing the percentages for students related to parents' ISCED-level – was 53% (OECD, 2012).

be monitored and better understood in order to build adequate strategies in urban and environmental policies, and at the same time it gives more tools to imagine and support specific actions and policies.

Moreover, this study added more information to fill the gap in the academic literature about the degree of urbanisation and residential perspectives of Millennials, which is more developed in the USA, whereas it lacks further investigations in Europe, despite its huge importance in the definition of medium and short term choices such as car purchase and use.

As a methodologic contribution, this study proposed methodologies that can be applied to other countries and at different scales: the regression model that can be replicated to understand the probability to choose also other modes (cycling, walking, public transport etc.) using the JRC database or similar ones including the necessary set of socio-territorial variables. Same can be said of the focus group structure, which can be proposed to replicate the study on other generations and social groups in order to compare the different imaginaries, attitudes, perspectives and system of values. At last, the car (in)dependencies scheme makes it possible to approach the different degrees of car dependency, and can be used to identify different targets for policy interventions, in order to better orientate strategies towards the fight against car dependencies.

Finally, with regard to the existing approaches for the study of travel behaviour (cfr. par. 1.4.1), the interdisciplinarity of this study (which crosses sociology, psychology, demography, geography, sometimes linguistic) fulfilled the purposes of the New Mobilities Paradigm. It agrees with the idea that what people do is never reducible to mere individual attitude or choices/prosecution of individual utility (classic utilitarianism), supporting the approach of social practice theory on travel behaviour studies, enriched with the one of mobility biographies. In particular reference of the latter, the research added further elements for the debate on residential self-selection and the reverse dependencies affecting travel behaviour, and contributed on the knowledge on some specific fields that Scheiner (2017) declared worthwhile of further investigation: i) that the transmission of behaviours from one generation to the next is not only caused by socio-psychological norms and learning, but has also an economic background (e.g. inheritance of residential property and

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vehicles); ii) the significance of generation specific mobility biographies such as the social norm of stays abroad among young adults.

It highlighted that human mobility is shaped by social structures, which in this case were represented by belonging to a specific generation (raising in the same historical era and living the same societal changes and processes) and/or territorial context (with different cultures and resources). It then answered at John Urry's call to a deeper understanding of human behaviour, which is a critical element for the development of a more sustainable future, and for the creation of just and effective environmental policies: *keeping the society at the centre of climate change studies* (Urry, 2011).

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Annex

A. JRC Data from EU Travel Survey (2014 and 2018)

Selected variables

Variables linked to travel behaviour / car mobility capital / attitudes

With regards to the most frequent trip:
   - Main mode
   - Duration
   - Distance
   - Frequency
   - N° of people in the car
- Attitude towards multimodality (for monomodals) *(only in 2018 edition)*
- Car sharing knowledge & subscription *(different questions in 2014 e 2018 editions)*
- Considering EVs for car purchase
- Vehicle purchase plans *(only in 2018 edition)*
- Available vehicles per capita *(computed variable, see procedure below)*
- Own driving license
- Why not own driving license *(only in 2018 edition)*

Socio-territorial variables used in the regression
- Urbanisation level - Country - Gender - Age - Education level - Occupation - Household type *(computed variable, see procedure below)* - Presence of children <15 years old in the household *(computed variable, see procedure below)*

Details on recoded / computed variables

The analysis of the JRC data in particular has been preceded by a long and meticulous process of data cleaning, harmonisation of datasets 2014-2018 for comparisons, recoding and creation of new variables for specific analysis and semplification, everything with a prior deepening of the knowledge on sampling and data weight (which happened mostly during the visiting period).

Variables regarding cohorts (Millennials and Baby Boomers) were always built (in each dataset) starting from the year of birth or age at the moment of the interview, considering Millennials the ones born between 1983-2000 and Baby Boomers between 1946-1964. Please note: in JRC 2014 dataset, Millennials were 14-31 y.o. at the moment of the interview. The survey only included people aged 16+, so people 14-15 y.o. were not represented. Plus, a variant "Millennials 18+" was made to exclude people not eligible for driving / license driving in many EU member states from certain analysis. Conversely, Baby Boomers in 2014 were aged from 50-68 y.o. but the over65 were severely underrepresented in the dataset, so people aged 49 were also included (MM=8.716; BB=7.130). In 2018, Millennials were 18-35 y.o. (9.798 respondents) and Baby Boomers 54-72 y.o. (5.039).

Dataset 2014: age frequency (own SPSS elaboration)
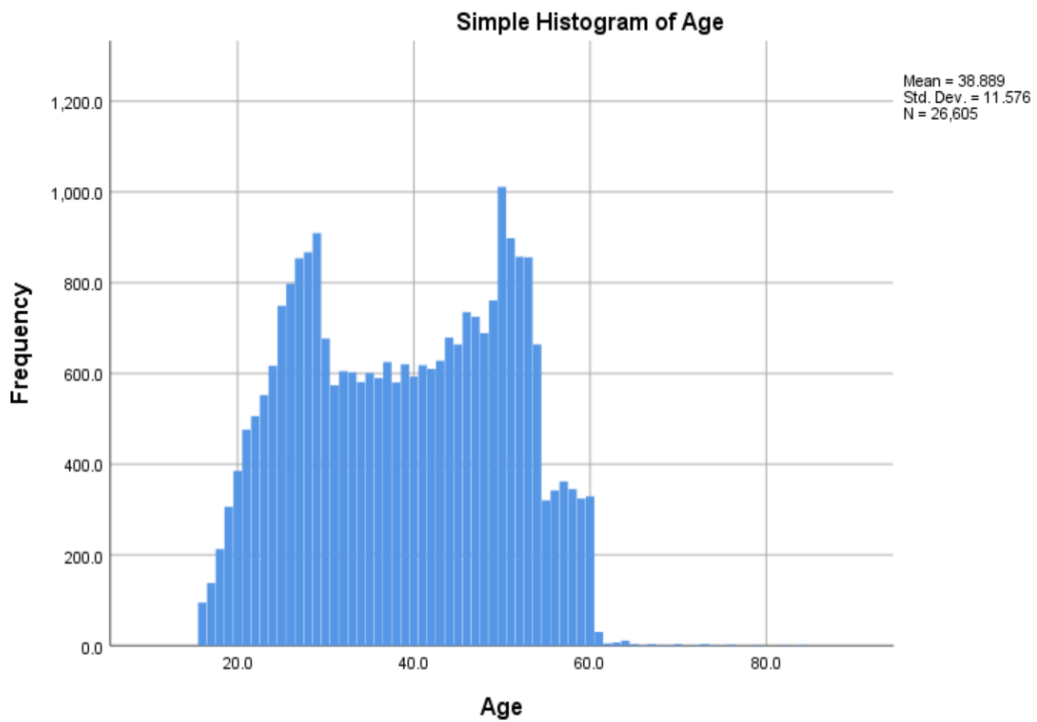
Dataset 2018: age frequency (own SPSS elaboration)
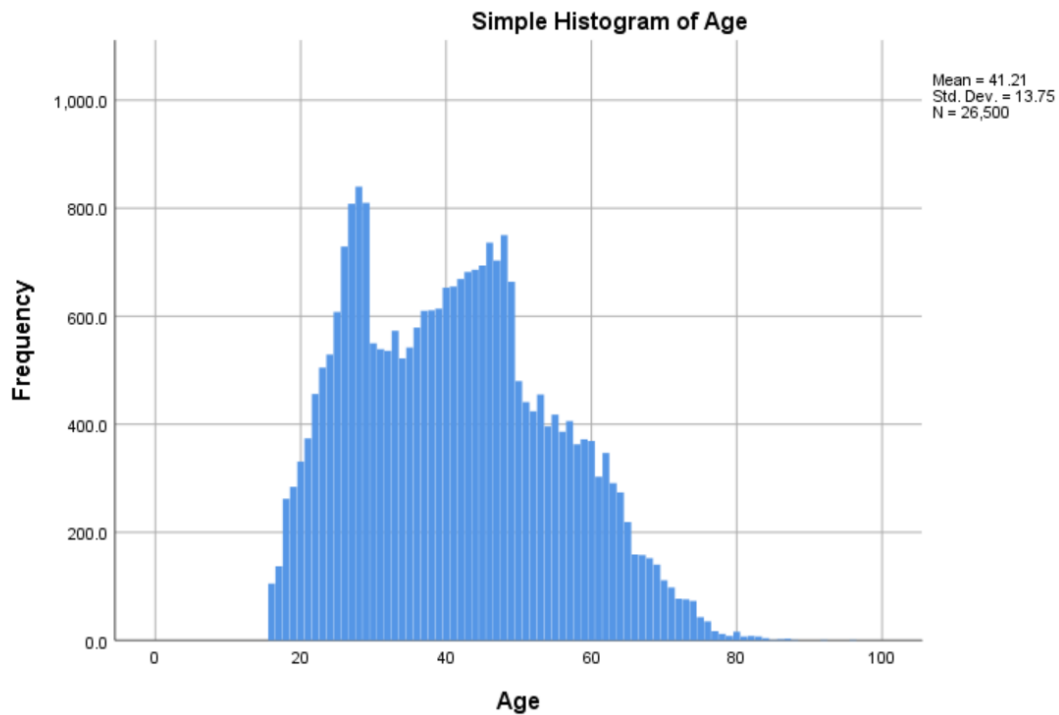
The variables "Household type" and "Presence of children aged >15 years old" were computed starting from the variables "Household members" (D6) and the variables from D7_1 ("Member aged 0-3 years") to D7_4 ("Member aged 12-15 years"), which brought to know the number of underage people and adults included in the household. This information was useful also to compute the variable "vehicles per capita" only considering the adult members of the household, starting from "Available vehicles in the household" (Q2).

Recode of mode choice for the most frequent trip

For this crucial variable, a substantial simplification process has been implemented. The survey allowed to give more than one answer to the question *"How do you usually make your most frequent trip? Please report all the options used (you can select more than one answer). Select "walk" only if you walked for more than 10 minutes"*, producing dichotomic variables for each mode (9 in 2014, 12 in 2018 which included sharing modes).

First, it was created a unique variable able to synthetize all the answers with more categories representing the modes plus one dedicated to multimodality for those who selected more modes:

RECODE MFT_MODE (1=1) (2 thru 3 =2) (4 thru 5 = 3) (12 = 3) (6 thru 7 = 4) (8=5) (9 thru 11 = 6) (13=7) INTO MFT_mode_simple.
VARIABLE LABELS MFT_mode_simple 'MFT main mode – less categories'.
EXECUTE.
VALUE LABELS MFT_mode_simple
1 Walk
2 Bike private or sharing
3 Private motorized vehicle driver or passenger
4 Car sharing driver or passenger
5 Train
6 Local public transport
7 More modes selected.
EXECUTE.

The various types of combination of multiple modes (multimodality) were grouped in more simple categories, creating another variable.
MFT_complex
1 Walk
2 Bike private or shared
3 Private motorized vehicles
4 Car sharing
5 Train
6 Local public transport
10 Multiple LPT
11 Multiple slow modes
12 Slow modes and LPT
13 Multiple private vehicles
14 Private vehicles and LPT
15 Slow modes and private vehicles
16 Slow modes and LPT and private vehicles.
EXECUTE.

Then, the variable was recoded in other variables following different levels of simplification on the basis of the analysis required, especially working on multimodality. For example, different combinations of modes selected were recoded selecting the predominant mode (e.g. train+any other mode=train; car+any other mode=car; slow modes + public transport = public transport).

Eventually, the highest level of simplification was to reduce all the different categories in three main groups of modes: motorised vehicle, slow modes, public transport (variable used in the regression analysis). A dummy variable Car=0/1 (which include car as driver or passenger, car sharing as driver or passenger, and motorcycle) was created to be the dependent variable of the regression analysis.

Regression analysis and syntax

The regression was preceded by a process of deepening and familiarisation with main basic data analysis methodologies which included correlation (based on different types of variables) and the different types of regression analysis – linear and logistic (implementation, requirements, interpretation). Several correlation analysis and reliability tests have been implemented to select the best set of predictors for the model. Many socio-territorial variables were simplified in dichotomic and/or variables with a lower number of categories (the final set of variables with the respective categories can be seen in Table 4.9).

```
LOGISTIC REGRESSION VARIABLES CAR_dummy
   /METHOD=ENTER  D1  Age_MMBB2  D3  D5_2  HH_type  Children  D8  D9
CLUSTER_EU
   /CONTRAST (D3)=Indicator(3)
  /CONTRAST (Age_MMBB2)=Indicator(2)
   /CONTRAST (HH_type)=Indicator(3)
   /CONTRAST (D5_2)=Indicator(1)
   /CONTRAST (D8)=Indicator(3)
   /CONTRAST (D9)=Indicator(2)
   /CONTRAST (CLUSTER_EU)=Indicator(3)
   /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
EXECUTE.
```

B. Eurobarometer data

Wave 79.4 (2013) and wave 88.1 (2017) selected variables

Variable name	Variable label
d60	DIFFICULTIES IN PAYING BILLS – LAST YEAR
d15a	OCCUPATION OF RESPONDENT*
d79	LIFE CONDITIONS IN 5 YEARS
d7r3	MARITAL STATUS AND CHILDREN**

- *recoded by me in a new variable to put all the different kind of jobs in the unique category of *'employed'*. The others were *'Retired' / 'Unemployed' / 'Student'*.
- **d7r3 is a recodification of d7 (MARITAL STATUS) done directly by Eurostat:
  - *single hh without children* if d7 = single without children; divorced/separated without children; widow without children
  - *single hh with children* if d7= single with children; divorced/separated with children; widow with children
  - *multiple hh without children* if d7 = (re)married without children; single living with partner without children
  - *multiple hh with children* if d7 = (re)married with children (of this and/or previous marriage; single living with partner with children (this and/or previous union)

C. EU-SILC data

Selected variables

Personal level
PB030: PERSONAL ID
PB040: PERSONAL CROSS-SECTIONAL WEIGHT
PB060: PERSONAL CROSS-SECTIONAL WEIGHT FOR SELECTED RESPONDENT
PB140: YEAR OF BIRTH
PB150: SEX
PB160: FATHER ID

PB170: MOTHER ID
PB180: SPOUSE/PARTNER ID
PB190: MARITAL STATUS
PB200: CONSENSUAL UNION
PE020: ISCED LEVEL CURRENTLY ATTENDED
PE040: HIGHEST ISCED LEVEL ATTAINED
PH030: LIMITATION IN ACTIVITIES BECAUSE OF HEALTH PROBLEMS
PL015: PERSON HAS EVER WORKED
PL031: SELF-DEFINED CURRENT ECONOMIC STATUS
PL140: TYPE OF CONTRACT
PL190: WHEN BEGAN FIRST REGULAR JOB
PY010G: GROSS EMPLOYEE CASH OR NEAR CASH INCOME
Household level
HS110: DO YOU HAVE A CAR
DB100: DEGREE OF URBANIZATION

Details on recoded / computed variables

Family composition

For each respondent, looking at the presence of an ID number of other members of the family (father, mother, spouse) it is possible to understand the household composition: if single, with partner, with parents or with parents and parents. If:

- Father + mother + partner is missing = *single*
- Father + mother are missing but spouse is present = *with partner*
- If mother and/or father are present = *with parents*

1) RECODE of IDs:
    o If ID Mother is >0 = 1 (0 if missing)
    o If ID Father is >0 = 2 (0 if missing)
    o If ID Partner is >0 = 10 (0 if missing)

2) CALCULATE new variable (sum of the three IDs recoded)
3) RECODE in a new var: if the sum is
    o 0 = single (0)

o   1,2,3 = with parent(s) (1)

o   10 = with partner (2)

o   >10 = partner & parent(s) (3) → very rare and considered together with
       the "with parents" group

RECODE PB195_TOT (0=0) (10=2) (SYSMIS=SYSMIS) (1 thru 3=1) (11 thru
Highest=3) INTO PB195_TOT2.
VARIABLE LABELS PB195_TOT2 'Household composition'.
EXECUTE.

D. Eurostat Data Explorer

Passenger car activity per regional clusters– full table

GEO/TIME	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EU28	83	83	83	84	84	83	83	83	83	84	84	83	83	82	83	83	83	83
Portugal	82	83	85	85	85	89	90	89	89	89	89	89	90	89	90	89	88	89
Italy	83	83	83	83	83	82	82	82	82	83	82	81	79	80	80	81	82	82
Ireland	81	81	81	81	82	82	82	82	82	82	83	77	83	83	82	83	83	83
Greece	73	74	75	76	78	78	79	80	81	82	82	82	82	81	81	81	82	83
Spain	81	81	83	83	82	82	83	81	80	81	82	81	81	81	83	81	82	85
Luxembourg	86	85	86	86	86	86	85	85	84	84	84	83	83	83	84	83	83	83
Sweden	85	85	85	86	86	86	85	85	85	85	84	84	84	83	84	83	84	83
UK	88	88	89	89	89	88	88	88	87	87	86	86	86	86	86	86	87	86
Netherlands	86	86	86	87	88	87	87	87	87	87	88	87	87	86	86	86	86	86
Denmark	80	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	82
Germany	85	86	86	86	86	86	86	86	86	86	86	86	85	86	86	86	86	86
France	86	87	86	87	86	86	85	85	84	85	86	85	85	81	82	83	84	83
Austria	79	79	79	80	80	80	80	79	78	79	78	78	78	78	78	78	78	78
Belgium	83	83	82	81	80	80	79	79	80	80	80	80	79	80	80	81	82	82
Finland	83	84	84	84	85	85	85	85	85	85	85	85	85	85	85	85	83	84
Bulgaria	61	62	61	67	70	71	73	74	75	80	80	81	82	83	82	83	84	85
Czechia	73	72	74	76	77	76	75	76	76	76	73	74	74	74	73	74	74	73
Estonia	70	70	72	74	73	76	78	77	79	82	81	82	81	81	82	78	80	81
Croatia	81	82	82	82	84	84	84	83	82	84	84	85	86	86	85	86	85	84
Latvia	77	80	77	76	74	74	77	79	79	80	78	76	77	77	79	81	82	83
Lithuania	82	83	82	85	87	90	91	91	91	92	92	91	92	91	88	89	90	91
Hungary	62	62	61	62	63	64	66	68	68	69	69	68	68	68	68	68	69	70
Poland	64	67	70	71	72	75	77	71	72	75	76	77	77	78	78	79	79	79
Romania	72	73	76	76	76	76	76	78	77	80	78	79	78	79	79	80	80	80
Slovenia	83	84	84	84	85	86	86	86	86	87	87	87	87	86	86	86	86	87
Slovakia	64	65	67	69	68	69	71	72	73	78	78	77	77	78	77	76	75	74

Median equivalalised net income of people aged 16-24 (EU 2015)

	Euro
Luxembourg	30,268
Denmark	23,049
Austria	22,600
Sweden	21,645
Belgium	20,444
Finland	20,078
Germany	19,954
United Kingdom	19,515
France	19,203
Netherlands	19,110
Ireland	18,649
EU28	14,869
Italy	14,117
Malta	13,922
Cyprus	12,922
Slovenia	11,959
Spain	10,961
Estonia	7,882
Portugal	7,508
Czechia	7,268
Slovakia	6,638
Greece	6,412
Latvia	5,765
Croatia	5,330
Lithuania	5,124
Poland	4,981
Hungary	4,038
Bulgaria	3,226
Romania	1,786

E. Focus group sessions

Consent form

AUTORIZZAZIONE AL TRATTAMENTO DEI DATI PERSONALI PER SCOPI SCIENTIFICI

Il presente focus group fa parte di un progetto di ricerca dal titolo «Mobilità Sostenibile: Millennials in Transition?», di Elena Colli, dottoranda in URBEUR – Urban Studies presso il Dipartimento di Sociologia e Ricerca Sociale dell'Università di Milano-Bicocca, sotto la supervisione del professor Matteo Colleoni. Il progetto intende indagare le abitudini di mobilità dei giovani adulti (generazione "Millennials"), l'immaginario legato all'automobile e ai mezzi alternativi, e le scelte di vita in comparazione con le generazioni precedenti.

A protezione dell'intervistat*, si precisa che le informazioni trasmesse <u>non</u> potranno essere utilizzate per scopi commerciali. Esse verranno registrate, elaborate e discusse esclusivamente a scopo di studio e ricerca, in forma aggregata e confidenziale. Il trattamento dei dati personali e delle informazioni raccolte nel corso dello studio sarà inoltre improntato ai principi di correttezza, liceità, trasparenza e riservatezza.

Pertanto, le informazioni fornite verranno elaborate in linea con il codice di deontologia e di buona condotta per i trattamenti di dati personali per scopi statistici e scientifici (Gazzetta Ufficiale 14 agosto 2004, n.190).

Ai fini dell'analisi del materiale raccolto, si chiede la disponibilità a registrare il focus group, che verrà condotto e successivamente trascritto dalla dottoressa Colli. Ai fini della bilanciata profilazione del gruppo, si chiede inoltre gentilmente di fornire i seguenti dati:

Anno di nascita	
Genere	
Comune (dove abiti attualmente)	
Consideri la zona dove abiti centro o periferia?	
Con chi vivi? (da sol*, con i genitori, coinquilini, partner…)	
Occupazione	
Titolo di studio	
Mezzo di trasporto più utilizzato	
Possiedi un'automobile?	

Do il mio consenso alla raccolta e registrazione dei dati e al loro uso nella forma descritta sopra:

DATA   NOME E FIRMA

_____   _____

Spatial distribution of the focus group participants

The location on the map is approximate and has the only purpose to show the differences of participants in terms of city centre / hinterland / suburb.

Milan area
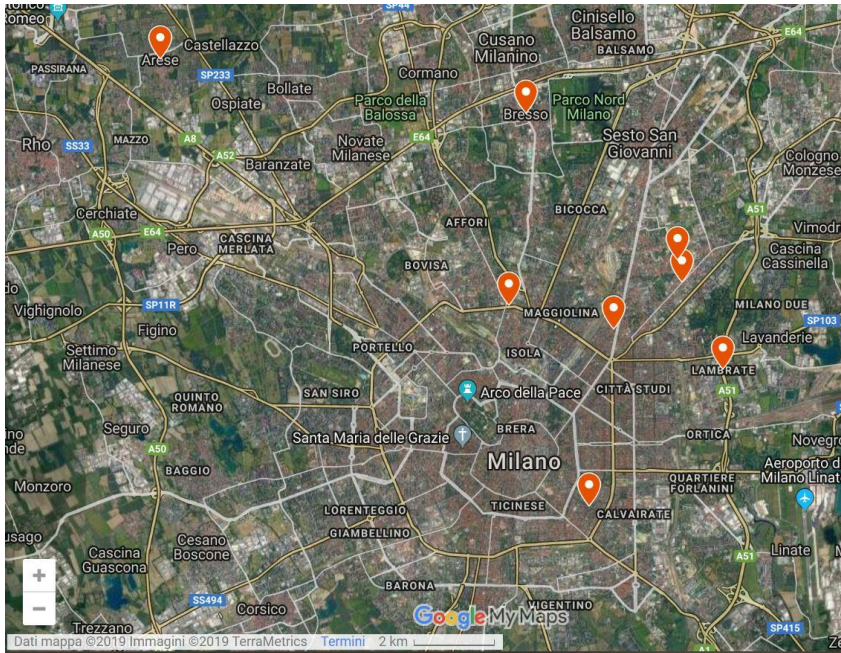
Rome area
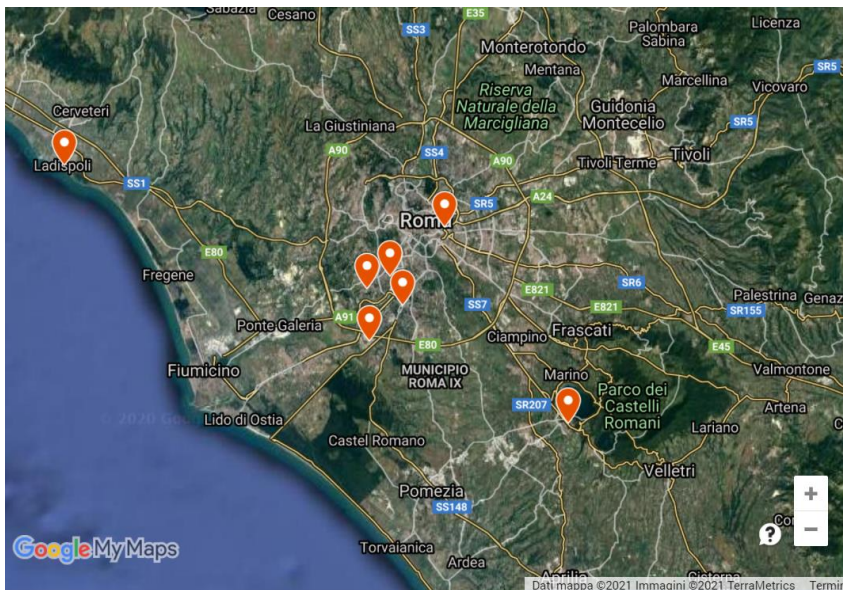
Province of Reggio Emilia area
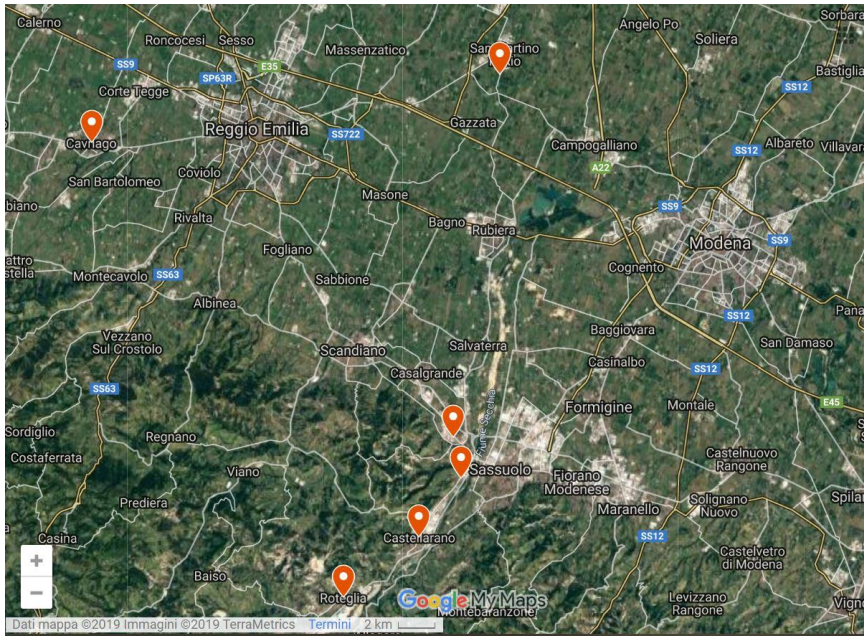
Pesaro area
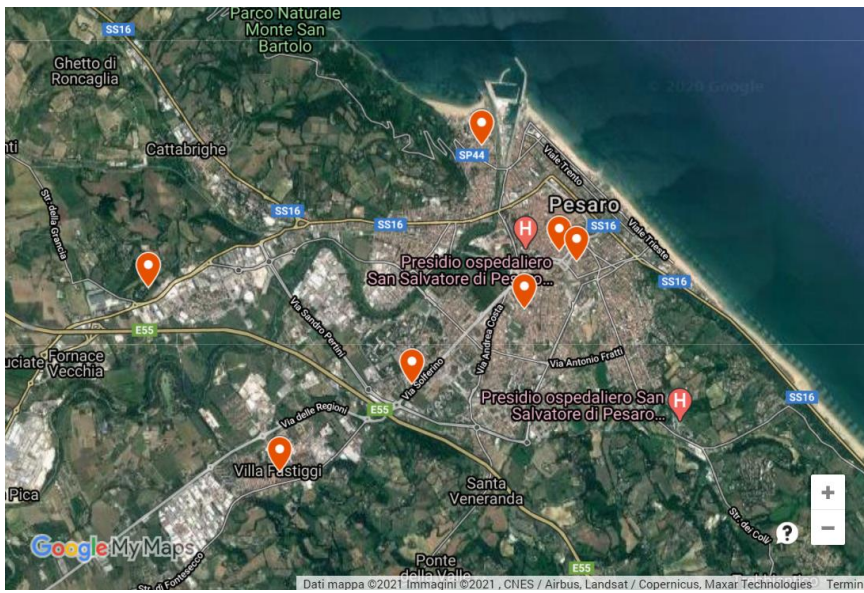
Catania area

Codes & basic information of the focus group participants

Name Code	Age*	Residential location	Occupation	Household type	Main mode
A, CT	28	city centre of a large city	employed	shared flat	Walk
C, CT	26	suburb	student	living with parents	Car
E1,CT	21	city centre of a large city	student	shared flat	PT
E2,CT	20	city centre of a large city	student	with parents	Walk
F, CT	26	suburb	employed	living with parents	Car
S, CT	28	city centre of a large city	student	shared flat	Car
M, CT	25	suburb	employed	living with parents	Car
F1, MI	27	city centre of a metrop.city	employed	shared flat	PT
F2, MI	34	city centre of a metrop. city	employed	living w. partner+child	Moped
G, MI	27	outskirts of a metrop. city	employed	shared flat	Bike
I, MI	29	suburb	employed	living with parents	Car
J, MI	23	outskirts of metrop. city	student	single HH	PT
L, MI	30	city centre of a metrop. city	employed	living with partner	Car
M1,MI	19	hinterland	student	living with parents	PT
M2,MI	26	outskirts of a metrop. city	unemployed	shared flat	PT
C, RE	32	suburb	employed	living with parents	Car
F, RE	27	suburb	employed	living with parents	Car

G, RE	22	suburb	employed	living with parents	Car
M1,RE	28	suburb	employed	living partner+child	Car
A, RE	29	suburb	employed	living with parents	PT
M2,RE	28	suburb	employed	living with parents	Car
F, RM	27	hinterland	employed	living with partner	Car
M1,RM	26	outskirts of metrop. city	student	living with parents	Moped
M2,RM	31	outskirts of metrop. city	employed	living with partner	Car
R, RM	27	outskirts of metrop. city	employed	living with parents	PT
S1, RM	35	outskirts of metrop. city	employed	Living w. partner+child	Car
S2, RM	29	hinterland	employed	living with parents	Car
V, RM	22	city centre	student	shared flat	PT
B, PE	21	city centre of medium city	student	living with parents	Bike
D, PE	33	city centre of medium city	employed	living with parents	Bike
G, PE	32	city centre of medium city	employed	living with partner	Bike
K, PE	19	city centre of medium city	student	living with parents	Bike
M, PE	34	outskirts of medium city	employed	living with parents	Car
O, PE	31	outskirts of medium city	employed	living with partner	PT
S, PE	19	city centre of medium city	student	living with parents	Bike

*= Age at the moment of the interview (late 2019/ early 2020)

F. List of figures and tables

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