

Understanding barriers to modal shift in Malta: A practice-theoretical perspective of everyday mobility

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Abstract

Transport has become locked into a pattern of unsustainable travel behaviours. One major barrier to limiting carbon dioxide emissions from the transport sector is the dependence of mobility on the car. Modal shift to low-carbon transport is essential to the decarbonisation of transport, yet it has not been fully understood. Analysing travel behaviours from an in-depth understanding of social practices can provide new insights of what might be required for modal shift. The aim of the research is to provide an in-depth analysis of the current mobility practices in Malta, including the elements of mobility practices, how mobility practices are embedded within social life in Malta, and potential future steps. Semi-structured interviews are used to provide qualitative data on everyday mobility practices. The results show how improved infrastructure for active forms of travel, more extensive public transport, skills in cycling, ability to calculate distances when walking, and feeling of safety on the road, are essential elements for low-carbon modes to be performed and endured. The analysis is also valuable to demonstrate how other social practices, such as work, parental responsibilities and shopping, are related to mobility practices and influence recruitment to one form of mobility over another. The coordination between these social practices and the complexities of everyday lives opens new insights for reflection on the type of interventions aimed at decarbonising transport.

Keywords: sustainable mobility; transitions; social practices; Malta; decarbonisation; transport

1. Introduction

The reduction of greenhouse gas (GHG) emissions has become one of the most important global challenges. Transport is one of the sectors that contribute significantly to GHG emissions, accounting for 23% of the total carbon dioxide (CO₂) emissions and 61% of the global oil consumption (International Energy Agency, 2021a), and it is one of the few sectors where emissions have continued to grow (International Energy Agency, 2021b). Road transport is the largest contributor in Europe alone, it accounts for nearly 72% of the total emissions (European Environment Agency, 2019). In this context, the shift to low-carbon mobility plays a major role in the achievement of the climate change mitigation targets. Despite its significant contribution, reducing emissions from transport has been difficult (Marsden and Rye, 2010, Banister, 2011), with one major barrier being the dependence of personal mobility on the private car – and the seemingly intractable reliance on car usage in many people’s everyday lives.

The current policy measures have not been successful in bringing the necessary transition to more sustainable mobility. It is widely recognised that shifting mode choice from car-based travel to low-carbon forms such as bus, cycling and walking has been very difficult (Whitmarsh and Köhler, 2010, Wells and Nieuwenhuis, 2012). There is a need for a range of policy measures to lower transport CO₂ emissions and radical changes are required – with a different set of policies and projects – if sustainable transport futures are to be achieved (Hickman and Banister, 2007, Hickman et al., 2010). In this context, new theoretical approaches have started to emerge, developing our understanding of the current high carbon mobile lives and how a significant shift to more sustainable forms of mobility can be achieved. One such theoretical perspective concerns social practices, which offers insights set at the societal level for investigating how the transport sector can better contribute to transport CO₂ reduction (Reckwitz, 2002, Schatzki, 2001, Schatzki, 1996, Shove et al., 2012, Watson, 2012, Spurling et al., 2013). Social-scientific analysis can serve as a means of understanding everyday mobility that moves beyond the narrow individualistic conception of travel behaviour. Such an understanding is important for recognizing how individuals develop, maintain or change routine mobility practices. It can provide a useful insight into how the configuration of different elements affect mode of travel and what can influence the transition to lower-carbon forms of mobility.

The aim of the research is to contribute to the current knowledge on mobility practices, including analysing the elements of mobility practices, how mobility practices are embedded within the social life in the context of Malta, and what strategies might be developed to achieve greater sustainability in travel behaviours. The analysis aims to explore a range of experiences related to everyday mobility and provide a perspective on practices of mobility and the complexity of social worlds in which these practices are embedded. The paper is structured in six sections. This introduction is followed by a literature review on practice theory and application to transport. Section three describes the case study on which the paper is based and section four gives an outline of the methodology. This is followed by the presentation of the results in section five and a discussion of the findings and how these can be used to inform policy for more sustainable transport in section six.

2. Literature Review

2.1 Sustainable transport and modal shift

It is widely recognised that reducing CO₂ emissions from the transport sector requires some degree of modal shift from car-based travel to lower-carbon forms of mobility (Chapman, 2007, Banister, 2008). Modal shift is recognized as one of the most important steps in the transition to sustainable mobility

and an efficient lever for reducing emissions (Hammadou and Papaix, 2015). Despite the importance of shifting to lower-carbon forms of transport, modal shift has proved to be extremely difficult to achieve (Cass and Faulconbridge, 2016, Whitmarsh and Köhler, 2010) and policies targeting modal shift will continue to fail unless viable and attractive alternatives are provided. Most of the policies for modal shift have focused on changing individuals' choices or investment in transport infrastructure (Brand et al., 2014, Pucher et al., 2010). Interventions which use land-use planning to make low-carbon travel more feasible by reducing travel distances (Newman and Kenworthy, 1999, Handy, 1996) and others which place the emphasis on deterring car use through economic instruments have also been popular amongst transport policies. These policies, which focus on the transport system while at the same time neglecting changes in everyday life, have had only marginal success in bringing the required shift to low-carbon modes (Hickman and Banister, 2007, Barr and Prillwitz, 2014). This suggests that policies that consider the effects of broader societal structures on mobility are required for more efficient modal shift (Banister, 2008, Marsden et al., 2014). In this context, different policy approaches are required if significant change is to be achieved (Tennøy, 2010). Insights from practice theory can start to inform alternative policy perspectives relating to modal shift (Schwanen et al., 2011).

2.2 Practice Theory

Practice theory presents a distinctive approach towards understanding society, with its origins in sociology, it provides new ways to understand the complexities of everyday life. In this approach, practices are viewed as the fundamental and smallest unit of social analysis (Reckwitz, 2002). Amongst social theorists, there is a wide variety of understanding as what constitutes a social practice (Reckwitz, 2002, Schatzki, 2001, Shove et al., 2012, Giddens, 1979, Bourdieu, 1987). Nonetheless, theorists agree that practices constitute routinised types of behaviour that are both reproduced and changed through their everyday enactment by people, or practitioners at different levels of social organisation, including societies, institutions and households (Pantzar and Shove, 2010, Shove and Pantzar, 2007, Watson, 2012).

There is also the general agreement amongst theorists that practices do not exist as single entities, rather they are constituted of a number of interconnected set of elements. Variances exist amongst the dominant thinkers about the different elements of a social practice as summarised in Table 1.

Table 1. The elements of social practices according to different perspectives

Theorist	Elements of Social Practices
Schatzki (2002)	Practices are spatially-temporally dispersed, open sets of doings and sayings organised by common understandings, teleologies and rules.
Reckwitz (2002)	Practices are made up of forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge.
Warde (2005)	Understandings, procedures, engagements and items of consumption are the elements that make up a practice.
Shove and Pantzar (2005) and Shove et al. (2012)	Three elements make up social practices namely competences, meanings and materials or alternatively skills, images and stuff.

Hargreaves (2011)	Describe practices as being made of three distinct elements where images (meanings, symbols), skills (forms of competence, procedures) and stuff (materials, technology) are dynamically integrated by skilled practitioners through regular and repeated performance.
(Gram-Hanssen, 2011)	Practices as composed of know-how and embodied habits, institutional knowledge, engagements and technologies.
(Brezet et al., 2001)	Practices are made-up of devices or artefacts, the physical and institutional infrastructure, and in user-practices involving learning and behaviour

Most studies which focus on investigating the transitions in everyday life (Scott et al., 2009, Cass and Faulconbridge, 2016, Spotswood et al., 2015, Kuijer et al., 2013) are based on the three-element model by Shove et al. (2012) (Figure 1).

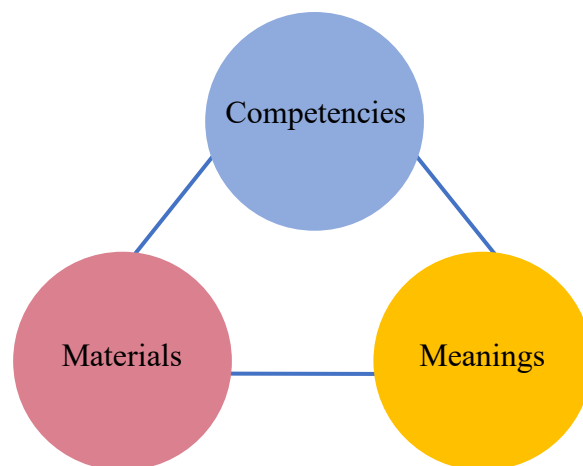


Figure 1. Three element model of practices. Drawn by author based on (Shove et al., 2012).

Practice theory also suggests that new practices emerge when existing elements combine into new hybrid configurations (Schatzki, 2013, Shove et al., 2012). Taking the case of car driving as an example, this practice emerged from existing elements, which included the materials (such as the roads), competencies (including positioning on those roads) and meanings (including an association with wealth-based status), that followed earlier transport systems, including the horse-drawn carriage and walking (Shove et al., 2012). Similarly, practice theory allows new mobility practices to be viewed as drawing on previous elements of mobility and to enable a transition to more sustainable forms of mobility as existing elements are reconfigured over time.

A central feature that distinguishes practice theory is that it moves away from individualist (psychological) concepts of travel and instead focuses on the embeddedness of practices in everyday life (Heisserer and Rau, 2017). The focus of this theory is not the individual behavioural and psychological aspects but a greater emphasis on social structures and conventions. Studies using this theory consider practices as positioned within sociocultural structures (such as work and family) rather

than the result of individual attitudes or choices (Plyushteva and Schwanen, 2018, Manderscheid, 2014). Individuals hence are not the central unit of analysis, but play an important role as carriers or performers of practices (Reckwitz, 2002). People are also key for transitions in practice by adapting, improvising and experimenting in changing circumstances of everyday life (Warde, 2005). Practice theory can serve as a lens through which to view how recruitment to and endurance of different practices takes place. Practice theory also recognises that individual practices do not exist as single entities, rather elements of the individual practices are connected with those of other practices forming tight complexes or loose bundles of practices (Shove et al., 2012). Practices are connected together by practitioners or when they take place in the same location or in sequence to each other (Schatzki, 2002). When different practices interact, they influence each other, and a change in one practice therefore can have an effect on other practices where it co-exists or is undergoing a transformation (Warde, 2005).

2.3 Practice theory and transport research

Theories of social practice have been useful in analysing transitions to sustainability (Walker and Shove, 2007, Spaargaren, 2011) and low-carbon mobility (Watson, 2012, Spurling et al., 2013). From the theory of a social practice perspective, mobility practices, such as driving or cycling, are distinctive practices made up of interdependent constitutive elements. The recruitment of individuals to a particular mode depends on the availability of the material elements, having developed the necessary competencies and the societally-valued meanings around that practice and is influenced by other social practices in which the individuals decide to engage (Shove and Pantzar, 2007). Such perspectives opens two new analytical insights and can identify new sites of intervention in transport that allows transition to low-carbon mobility (Watson, 2012). Theories of social practices can reveal how current mobility practices evolved from the availability of existing elements or how new elements have shaped the formation of new mobility practices. This type of understanding can help shed light on those elements of low-carbon mobility practices that are missing and hence hindering the shift to more sustainable forms of mobility (Watson, 2012), or how the reconfiguration of the elements may help the transition to low-carbon mobility (Birchnell, 2012).

In addition, a social practice perspective allows the examination of the embeddedness of mobility in everyday life, how mobility practices such as car-driving interlock with other social practices and how mobility practices such as car-driving become a perceived essential part of people's daily routines (Spurling et al., 2013). Such an examination can provide an in-depth understanding of the ways in which modes of mobility such as car driving allow socially-valued practices to be accomplished, including commuting to work, travelling to school, shopping, visiting friends, and so on (Cass and Faulconbridge, 2016, Shove et al., 2015a). In this way, the theory of social practice allows attention to be drawn to the complexity and time-space of different social practices and their coordination influences recruitment of individuals to different types of mobility (Shove et al., 2012, Southerton, 2012).

Research in the field of mobility practices is focused on how a specific transport mode (e.g. driving, walking or cycling) is embedded in everyday life (Spotswood et al., 2015, Laakso, 2017, Guell et al., 2012, Svennevik et al., 2020). Other studies have employed practice theory to understand modal-shift from the car to other more sustainable forms of mobility (Cass and Faulconbridge, 2016, Meinherz and Binder, 2020a, Saunders et al., 2009, Kent et al., 2017, Kent and Dowling, 2013) with some of these studies focusing on the barriers to modal shift in commuting practices (Cass and Faulconbridge, 2016, Meinherz and Binder, 2020a). Studies have also looked at how mobility is a result of practices and activities rather than influenced by either structure or agency. For example, research investigating car-dependence from a practice-based approach, in contrast to other studies which focused on the built

environment or behavioural aspects, looked at practice-specific factors that influence how individuals travel (Mattioli et al., 2016). Most of these studies have relied on semi-structured interviews for generating qualitative data that can provide an understanding of how mobility practices have evolved and which structural factors shape the recruitment of practitioners or which challenges inhibit the uptake of sustainable practices. Mobility biographies research is also a common approach amongst those studies analysing modal shift from a theory of social practice perspective (Kent et al., 2017, Rau and Sattlegger, 2018, Uteng et al., 2019).

The body of research on mobility practices serves to demonstrate the applicability of a social practice perspective in informing transitions to more sustainable forms of mobility. It takes us beyond the more conventional analysis found in transport that, for example, examines infrastructure changes and perhaps individual characteristics, including individual attitudes, but tends to overlook societal structures. All of these dimensions are likely to be important in changing travel behaviours. The next sections will focus on the context of this study and the methodology employed to investigate mobility practices in Malta.

3 Study Context

Malta is an island state located in the Mediterranean with an area of 316km² and a population of 475,701 in 2017 (NSO, 2019). Malta is the smallest of the European Union member states, consisting of an archipelago of islands. The islands are divided into six districts which are further divided into 68 local councils (Figure 2). The population density in Malta (1,548 persons/km²) is the highest in the EU (average 118 persons/km²) (Eurostat, 2020b). The number of households in Malta in 2020 was of 206,868 of which 93.3 % resided in Malta region and 6.7 per cent resided in the Gozo and Comino region. The most densely populated districts are the Northern Harbour and Northern districts which between them account for 56.4% of the total households in Malta (NSO, 2022).

Malta experienced a rapid growth in car ownership and use during the end of the last century (Attard, 2005). Today, Malta is characterized by one of the highest rates of motorisation in the EU with 608 cars per 1,000 inhabitants (Eurostat, 2020a), hence provides an interesting example of high levels of car usage embedded in everyday life. The modal split for private car rose from around 55% in 1989 to 74.6% (in 2010) (Transport Malta, 2010) and average car occupancy is very low with 1.25 persons per vehicle (Transport Malta, 2016).

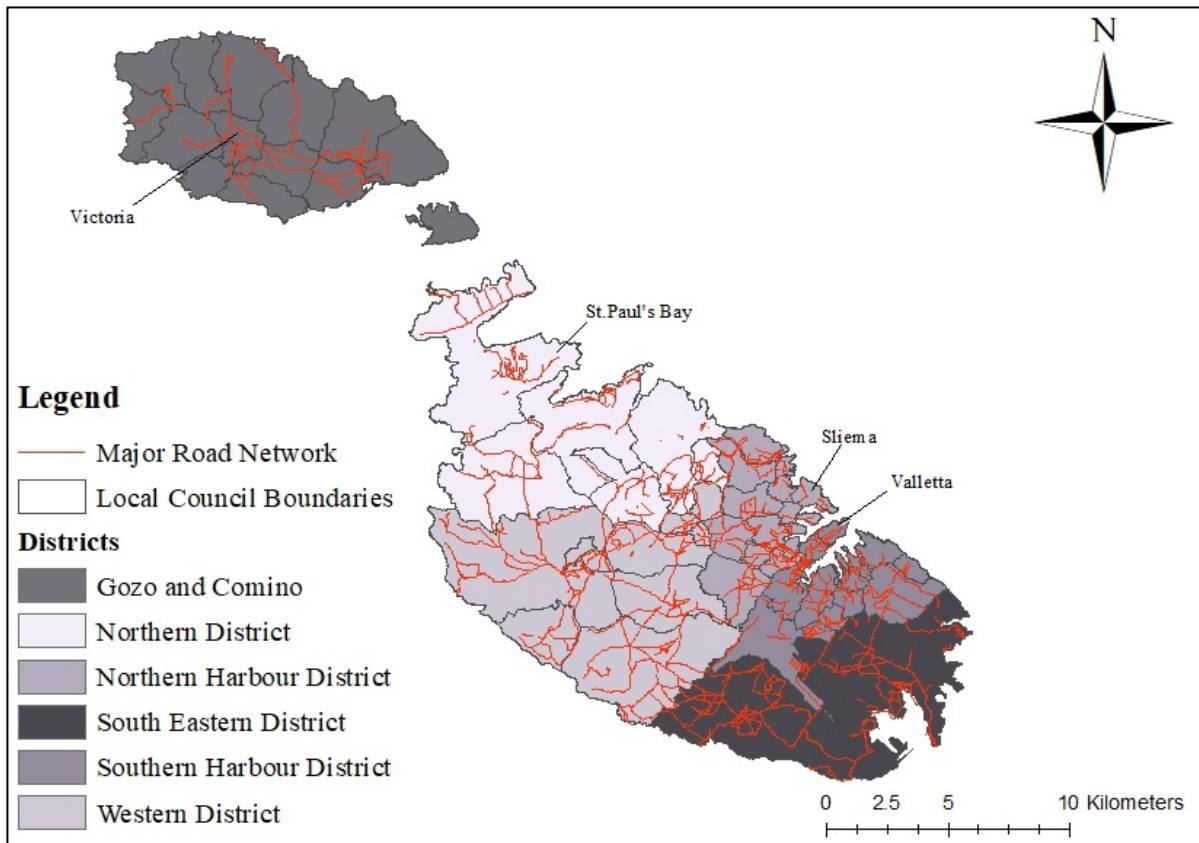


Figure 2. Districts of Malta. Drawn by author.

Other forms of transport have only a small share of the modal split. During a typical weekday, the modal share of bus based trips is of 11.3% of all trips (Transport Malta, 2016). As for the use of active modes of transport, only 7.6% of trips are made on foot (Transport Malta, 2010). According to a Eurobarometer survey on mobility in 2013, Malta has one of the lowest rates of cycling in the EU, with only 1% of the respondents cycling every day and 93% never cycling (European Union, 2014). In this context, we seek to provide insights into which factors affect car dependence and hinder recruitment of practitioners to sustainable forms of mobility.

4 Methodology

4.1 Research Design

The research design was based on qualitative social research approaches with the aim of gathering data on individual experiences on everyday mobility. Semi-structured interviews were used to draw information on the mobility practices in Malta. The interview questions focused on the respondent's experiences of different modes choices, their perceptions, beliefs, skills required to perform the mobility practice and meanings they attribute to how they travel (Gosselain and Bartiaux, 2011, Spotswood et al., 2015).

4.2 The Sample

A purposive sampling design was adopted where the aim was not to produce a representative sample of the population but rather to illustrate the varied experiences of mobility practices in the islands. The

data collection was carried out in Malta in 2019 with participants recruited through an advertising campaign using different channels. This strategy was designed to attract participants with a range of different lifestyles and experiences, geographical distribution, and a wide range of mobility practices. The recruitment campaign attracted a good number of individuals (around 45) who showed interest in participating in the study. From these, 20 individuals were selected for the semi-structured interviews (Table 2). The sampling design used a set of criteria to choose the participants, including age, place of residence, preferred mode of travel and lifestyle, ensuring a mix of mobility experiences and narratives.

Table 2. Detailed characteristics of the participants in the study

Interviewee	Gender	Age	Preferred mode	Employment Status / Type	District of sampling	Other Details
1	Male	22	Bus/Car	Student	Southern Harbour	Full-time student, participates in other activities related to music after college
2	Male	29	Car	Middle Management	Northern Harbour	In full-time employment, enjoys outdoor activities in his free time
3	Male	24	Bus	Professional	Northern	In full-time employment, travels primarily by bus. Outside work he visits friends and participates in other social activities
4	Female	40	Car	Management	Northern Harbour	Manages a school for performing arts. In her free time she likes to socialise and mainly uses the car to get around
5	Male	38	Bike	Teacher / Business Owner	Northern Harbour	A business owner and a teacher who uses the bike to travel to his activities. He makes use of the car when he takes his family for outdoor activities
6	Female	40	Bus	Self-employed / Stay at home	Southern Harbour	Uses the bus as main mode of travel and walks to the site of her activities
7	Male	40	Bike	Administrative	Northern Harbour	Is in full-time employment and participates in sport during his free time. He does not own a car and makes most of his trips using his bicycle
8	Female	58	Car	Professional	Northern	Works as a full-time learning support assistant. Makes use of the car to go to work but chooses to run her errands on foot at shops which are close to her home
9	Female	31	Car	Professional	Northern	Full-time employee and mother to two children. Perceives that owning a car is necessary to attend to the needs of her children
10	Female	34	Car	Professional	Northern	Employed full-time and active with voluntary organisations in her free time. Uses the car as the main mode of transport
11	Female	34	Bus	Lecturer	Northern	Uses the bus to travel, however views that this limits her mobility
12	Male	42	Bus/Taxi	Administrative / Clerical	Gozo	Does not own a car and uses the bus to travel. This mode of travel is seen as limiting in terms of accessibility and efficiency
13	Male	65	Car	Retired	Gozo	Retired teacher who prefers the car to travel around to move between his daily activities
14	Female	32	Car	Professional	South-Eastern	A young female who is in full-time employment. She makes use of the car to meet her mobility needs

15	Female	58	Walk	Administrative	South-Eastern	An older female, still in employment. She does not own a car and makes use of the bus or walks to the sites of her activities
16	Male	36	Car	Professional	Western	Uses the car to travel to and from work and to meet the mobility needs of his family
17	Female	19	Bus	Student	Western	A teenage female who does not own a car and travels using the bus
18	Male	18	Bus	Student	Western	Young male travels using the bus as the main form of transport. Perceives that having a car would facilitate his travel
19	Female	45	Walk / Car	Administrative	Southern Harbour	Her place of work is in the same locality where she lives which allows her to easily commute on foot
20	Male	55	Electric Car	Senior Management	Southern Harbour	His environmental consciousness pushed him to opt for an electric car to travel to his activities

4.3 The interviews

The interviews were conducted in different locations depending on the participants' choice. Each of the interviews lasted between 30 to 60 minutes and, with the participant's consent, was audio-recorded. The semi-structured interview consisted of five parts. The first part introduced the aims of the study and collected data on individual characteristics. The next section was aimed at understanding the daily activities of the participants and how mobility fits into their routinized everyday life. The interviewees were then asked questions about their experiences with the forms of mobility they engage, their perceptions, beliefs, skills required for the mobility practice and meanings they attribute to how they travel (Spotswood et al., 2015, Gosselain and Bartiaux, 2011). Participants were also asked questions about how their everyday mobility changed over their life course, probing the participants to think about the competencies that would be required to engage in different forms of mobility and how different life events trigger choices or shifts in travel behaviour (Cass and Faulconbridge, 2016, Meinherz and Binder, 2020a). Lastly, participants were invited to reflect upon their mode choices to travel to sites of day-to-day activities and if other forms of mobility would allow them to carry out their daily routines.

4.4 Methods of data analysis

The literature review has shown that there is no unified theory of social practice. However, common ideas on social practices can be found between theorists (section 2). For the purpose of this study, these concepts were used to guide the analysis of the interview data collected during the empirical stage. Similar approaches were found to be useful in studies that investigate mobility through a social-practice based perspective (Heisserer and Rau, 2017, Meinherz and Binder, 2020a, Sattlegger and Rau, 2016).

Table 3 summarises the concepts that were used to guide the qualitative analysis. Such an approach aims to capture the constituent elements of mobility practices, including the material configurations but also the individual abilities and meanings. In addition, the analysis aims to provide a view on how mobility practices are embedded in the social structures of everyday life. Adopting such an approach allows for an understanding of mobility based on the individual's understanding and

Table 3. Concepts guiding thematic analysis

Concept	Theoretical concepts	Application to qualitative analysis
<i>Performance of everyday mobility</i>	Practices constitute routinised types of behaviour that are both reproduced and changed through their everyday enactment by people, or practitioners (Schatzki, 2002, Reckwitz, 2002, Shove et al., 2012).	What forms of mobility do individuals perform during their everyday routines?
<i>Configurations of everyday mobilities</i>	Three elements make up social practices namely competences, meanings and materials or alternatively skills, images and stuff (Shove et al., 2012).	Which material configurations constitute the daily forms of mobility, what competencies or skills are needed to carry out the practices and which meanings are attributed to the mobility practices?
<i>Mobility and its embeddedness in everyday life</i>	Individual practices do not exist as single entities, rather elements of the individual practices are connected with other practices forming tight complexes or loose bundles of practices (Schatzki, 2002, Reckwitz, 2002, Shove et al., 2012, Warde, 2005).	How is mobility embedded within the societal structure and how does it interact with other social practices?
<i>Life events and their influence on everyday mobility</i>	Individuals play an important role as carriers or performers of practices. People are also key for transitions in practice by adapting, improvising and experimenting in changing circumstances of everyday life (Schatzki, 2002, Reckwitz, 2002, Shove et al., 2012, Warde, 2005).	How do life events influence the recruitment of individuals to certain mobility practices and not others?

The data from the audio-recorded interviews was transcribed and subjected to thematic analysis using NVivo software. In the first step of this thematic analysis, a deductive approach was adopted where the narratives from the field study were examined for the occurrence of reference to the elements (materials, competencies and meanings) of the mobility practices. For this exercise, the three element model of social practice (Shove et al., 2012) was used as the basis for creating themes and codes. In this coding exercise, the researchers also looked for narrative statements describing how mobility practices were performed and the ways in which mobility practices related to other social practices. To guide this deductive approach, concepts from the theories of social practices, as described in Table 3, were followed. The second stage of the analysis consisted of a more inductive approach, where the narratives were screened to draw information about the influence of everyday life on mobility practices, how life events shaped the shift from one form of mobility to another and the way in which the spatio-temporal rhythms of daily routines affect the recruitment of individuals to different forms of mobility. In this inductive approach, the narratives themselves were used to identify themes which would provide an insight into the factors contributing to the observed everyday mobility. The findings from the thematic analysis are presented in the next section.

5 Findings

Important insights on mobility practices in the context of Malta become evident from the study. First, the participants' narratives describe how an interconnected set of elements are necessary for a given

mobility practice to be performed. Secondly, the experience of the participants allows for an understanding of how mobility practices are interlocked with other forms of social practices and how other social aspects of daily lives shape mobility choices.

5.1 The elements of mobility practices

Thematic analysis of the interview data revealed the set of factors which constitute the current mobility practices in Malta. These initial results and observations are illustrated in Table 4, which shows how different mobility practices such as car-driving are made up of material elements, require a set of skills to be performed and are associated with particular meanings. The quotes on the right-hand of the table provide examples and reference to elements of mobility practices which participants described during the interviews. The next two sections will provide further insight into how these elements of mobility practices are inter-related and essential for the performance of the practices.

Table 4: Elements of mobility practices

<i>Materials</i>	<i>Competencies</i>	<i>Meanings</i>		<i>Interview quotes for elements of mobility practices</i>
<i>Car driving</i>				
<ul style="list-style-type: none"> - Storage capacity - Lack of road enforcement - Parking spaces - Congestion 	<ul style="list-style-type: none"> - Driving license - Road rules - Navigation - Reading traffic updates - Reading weather forecasts 	<ul style="list-style-type: none"> - Ambition (+) - Clean (+) - Comfort (+) - Necessity (+) - Efficient (+) - Pleasant (+) - Convenient (+) - Independence (+) - Personal space (+) 	<ul style="list-style-type: none"> - Isolation (-) - Stress (-) - Expensive (-) - Negative environmental impact (-) 	<p>Storage Capacity: <i>"If I am carrying certain equipment, certain gear, the luggage carrying capacity of the car itself is a huge advantage of the car which other modes of transport do not have."</i> (interviewee 2)</p> <p>Convenient: <i>"Let's be honest about it. The car is absolutely convenience."</i> (13)</p>
<i>Using the Bus</i>				
<ul style="list-style-type: none"> - Roads - Bus - Bus stops - Limited storage capacity - Limited accessibility - Low frequency 	<ul style="list-style-type: none"> - Reading route maps - Use of route planning applications 	<ul style="list-style-type: none"> - Good use of time (+) - Less stress (+) - Meeting other people (+) - Environmentally friendly (+) - Time to appreciate surroundings (+) 	<ul style="list-style-type: none"> - Unclean (-) - Lack of personal space (-) - Inefficient (-) - Unreliable (-) - Lack of status (-) - Limiting (-) - Uncomfortable (-) 	<p>Use of route planning applications: <i>"The mobile app gives me the route and the time when the bus will arrive. I also have information of the best route and the list of all the buses that you can use to reach your destination."</i> (17)</p> <p>Inefficient: <i>"if public transport worked more efficiently, I would happily change."</i> (4)</p>
<i>Cycling</i>				
<ul style="list-style-type: none"> - Bicycle - Electric bicycle - Waterproof clothing - Carry small objects 	<ul style="list-style-type: none"> -Cycling knowledge - Ability to cycle uphill - Navigation 	<ul style="list-style-type: none"> - Extension of one's legs (+) - Low cost (+) - Fast (+) - Freedom (+) - Healthy way of travelling (+) 	<ul style="list-style-type: none"> - Unsafe (-) - Relaxing (-) - Social aspect (-) 	<p>Navigation: <i>"Some paths that there are make my life very easy and I thank God for them."</i> (5)</p> <p>Cycling knowledge / Lack of proper infrastructure:</p>

- Short distances - Lack of proper infrastructure - Lack of shower facilities		- No parking problems (+)	<i>"I don't really know how to ride a bicycle and the roads are not adequate."</i> (17)
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Walking

- Short distances - Rainproof kit - Good walking shoes - Lack of proper infrastructure	- Walking fast - Familiarity with walking - Calculating distances	- Social aspect (+) - Benefit to health (+) - Relaxing (+)	- Unsafe (-) - Breathing polluted air (-)	Familiarity with walking: <i>"I walk a lot. For some people walking 20 minutes is a long way, for me it's quite normal."</i> (6) Relaxing: <i>"I just walk home after a long day of work. It's just really good to relieve stress."</i> (3)
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(+) positive meanings (-) negative meanings
interview number

Numbers in brackets refer to

5.1.1. Material elements of mobility practices

In the context of Malta, the car is the preferred mode of travel and easily recruits practitioners. According to the participants' views the material elements of car-use are widely available making car use easy. The most important material elements are the convenience of driving from A to B, and also the car itself, which offers the capacity to store and transport objects (Table 4). These findings are in-line with the psychological literature on the motives for car use, where it is widely acknowledged that the practical aspects of car use are positively valued (Steg et al., 2005, Steg, 2005). The instrumental-function of the car provides flexibility, fast travel times and a means to carry one's goods (Lois and López-Sáez, 2009, Bergstad et al., 2011).

Several materials elements are of significance for the use of the bicycle and walking as forms of mobility. As can be observed from Table 4, the provision of good infrastructure is a fundamental aspect of active travel and, in the participants' views, the lack of such materials makes them not choose these forms of travel. This supports other studies on active forms of travel, which have found provision of high quality infrastructure achieves higher level of cycling and walking (Moudon et al., 2005, Pucher and Buehler, 2008). Another important material element that this time is an enabler to active forms of travel are the short distances over which the participants need to travel to reach the sites of their activities. The interviewees state that the small size of the Maltese islands means that different activities are often located close together, making the use of cycling and walking possible for moving between sites. However, activities are spread beyond the main compact urban centres, such as Valletta, and there are few attempts to plan the dispersal of new development, e.g. to plan new development along high-quality public transport routes. Hence journeys can be difficult for public transport, walking or cycling. The availability and use of waterproof clothing assists with walking and cycling – having a rain jacket or other waterproof clothing means that participants can still make use of active forms of travel regardless of the weather.

(3) *"You must always think ahead. If I know it's going to be rainy, I prepare my waterproof shoes to go to work on foot"*

5.1.2 Competencies and meanings of mobility practices

The application of practice theory can provide a more in-depth insight into mobility practices by bringing the focus not only on material elements but also on the competences and meanings associated with these practices. For example, the results in Table 4 suggest that for individuals to take up cycling, the provision of high-quality cycling infrastructure is critical. However, alongside, the capability to know the best route and navigate to the destination are critical for this form of mobility practice. Other competencies such as safety and knowledge about cycling were shown to be important for the cycling practice. The data from the study showed that most of the participants seemed to lack competencies required for cycling, with some individuals stating that they wish to start cycling but feel they lack the skills or are afraid of using bicycles. A good level of fitness is also necessarily to travel by bicycle, indeed is one of the perceived benefits from the activity.

In terms of walking, the interviewees emphasised three important competencies. First, being familiar with walking as a mode of travel, the ability to walk with a fast pace, and having the skill to calculate distances and travel times for different destinations. Using the bus requires specific competencies. One such skill is the ability to read information about the routes and navigate the journey. Another competence is the use of mobile phone apps designed to provide users with accurate and up-to-date information about their bus journeys. In addition, using the bus also requires the capability to plan the trip.

Table 4 also reveals that meanings which individuals associate with different modes of travel are important factors in the recruitment to that particular form of travel. For example, travelling by bus necessitates a reliable system that allows its practitioners to travel efficiently and arrive on time to the sites of their activities. From the perspective of the participants, travelling by bus also requires a dense network of bus services that allow easy access to different places on the islands and does not limit individuals from taking part in their day-to-day activities. Other meanings attributed to the bus, which contrast to the positive meanings given to car driving, include the lack of personal space, the perceived lack of journey comfort, and the level of cleanliness, which the participants perceive as out of their control, yet not to their liking. These factors which also include crowded buses, lack of service provision, discomfort (Stradling et al., 2007) and overtly long journeys tend to discourage the use of the bus and push individuals to other forms of travel (Metz, 2008).

The research reveals a number of positive meanings are given to active modes of travel. These include the health benefits of active travel, the low cost and the idea that travelling on foot or by bicycle helps people to relax during their journey. Active travel modes are very well suited to short journeys. In addition, moving around by bicycle also provides a sense of freedom, despite some negative meanings such as safety concerns (Jones, 2012). On the other hand, meanings of poor safety have often been associated with walking and cycling in Malta and highlight the need for interventions that would enable safer use of active forms of mobility.

(7) *“People don't feel safe when cycling. My colleagues and other young people often tell me how they are not at ease when using a bicycle”*

These findings on the elements of mobility practices in the context of Malta suggest that positive experiences about different modes of travel shape mobility choices. The comfort of the car, the technology that guides the individual to use the bus, and the freedom of the bicycle and walking are all factors which influence mode choice.

5.2 Mobility and its embeddedness in everyday life

Another facet of mobility as a social practice is the embeddedness of travel in every-day life and how the social life influences and shapes mobility choices. Most of the participants recounted how their everyday activities directly influenced how travel decisions are made, negotiated and altered. Many of these decisions were shaped by the social structures and the other social practices that make up their daily lives.

5.2.1 Influence of work and education

One common theme that emerged is that the recruitment to some form of mobility practice depends on the fixed starting or finishing times of other social practices. This is most evident when the interviewees describe the activities involving work and education. For example, one of the participants, who is completing his studies at university, describes how he chooses to travel with the car to campus because taking the bus means he would arrive either too early or too late. Other participants describe how their job requires them to be mobile during the day and travel between different sites. They recount how the bus would not allow them to travel between different places in a timely manner. Hence, these participants use the car for their daily mobility as exemplified by some of the interview narratives (number in brackets indicates interviewee number in Table 2)

(5) *“I have such a random timetable and locations all over the place, public transport doesn't work. It doesn't. It would take me triple the time to do anything.”*

(11) *“I used to work with a newspaper and being a non-driving journalist is very tough. It limits your work.”*

Another woman described how she would like to walk every morning from her home to her place of work. She states how she values some physical exercise as part of a healthy lifestyle and going to work on foot would help her achieve her goals in terms of maintaining a good way of living. However, she also states that because she must be at work at an early hour of the day and her work schedule does not allow her to be late, commuting on foot would not be a feasible option for her. In contrast, two other participants describe different motives for choosing cycling as their preferred mode of commuting. For one interviewee the realization that cycling to work is faster than driving was enough to make him shift driving to cycling. Interviewees commuting on a bicycle also state they find cycling enjoyable and as a means to exercise during the day.

(5) *“It was ridiculous that I was wasting so much time in traffic. I tried cycling to work and it was an eyeopener. I get to enjoy it as well, I enjoy being on two wheels.”*

These narrative accounts of everyday mobility reveal time constraints related to the commute that shape decisions around choice of travel modes, routes and timings. However, we can also note how the narratives differed amongst participants where values and explanations varied greatly. This suggests that mode choice cannot be attributed to a linear rational reasoning, instead a varied set of social factors are at play in choice of travel mode.

5.2.2 The spatiality of social practices

One important element that emerges from the interviews is the spatial distribution of the social practices that individuals engage in during their daily routines. The data collected from our research shows how the spatiality of social practices sometimes allows for the adoption of low-carbon forms of mobility. For example, one of the participants highlights how her choice of living in the central urban area means that journey distances are short, thus allowing her to move on foot. Another participant describes how the mode of transport affects his decisions about employment as well as after-work activities.

(12) *“I live in the central part of the town. So, when I pop out the door I find everything around so it makes it easier for me. Other people, I think they have to go by their car.”*

The significance of these findings show how the places at which different practices are performed and paths between them define the spatiality of everyday life (Schatzki, 2009). This spatiality in turn defines the recruitment to modes of mobility over other forms. One solution is urban planning for spatial compactness that allows for short distances between sites of practices and allow for low-carbon forms of travel (Ignaccolo et al., 2016).

5.2.3 Life events

The findings on mobility practices show several aspects of the impacts of life events on shaping choices about mobility and shifts from one form of mobility to another. Such a perspective can help us understand how some specific life events affect how individuals choose to travel during their daily social lives. This can help in providing deeper insights into those factors that can trigger modal shifts.

Data collected clearly indicates the effect of some life events on mobility, one of the most impactful being parenting. Our findings are similar to other studies which find parenthood increasing car-based everyday mobility (Janke and Handy, 2019, McCarthy et al., 2021, Oakil, 2016). The narratives show how the advent of having a child brings with it additional needs to travel between different sites of practices, such as schools and parents’ places of work. With this increased need to travel, the car is often seen as the most viable means of meeting these needs.

One young mother describes how her childcare arrangements and her work schedule mean she has no other option than using the car. Another participant explained, since the birth of their children, her close friends have become more reliant on the car for their travel and in addition states that they would not be able to attend to the travel needs of their family without a car.

(9) *“I can't ride a bike with my kids on board to drop them off to school or go with the public transport.”*

Another important life event that was observed to have an impact on everyday mobility was the transition into adulthood. Many of the interviewees gave accounts of how they used to travel when they were young. As they became adults, the number of activities and life commitments they engaged in increased. This often resulted in the need to travel faster from one activity to another, thus motivating individuals to start using the car.

(1) *“Having other activities made me change the way I travel. When I was young, I used to travel only to school which was within walking distance. As I got older, I started attending drama lessons, which meant travelling over longer distance. I needed to use the bus or travel by car with my parents.”*

These narrations and experiences from the study participants show how life events such as parenthood and transitioning into employment or getting a new job have an impact on the travel-decisions of the individuals. Further life events can be related directly to mobility. As most of the car-drivers in our study explain, when they reached adulthood, they started to learn how to drive and eventually acquired a driving license. This life milestone was pivotal in changing the way they travel. One of the participants explained how she could have easily performed her trips using public transport yet, once she passed her driving license test, she started moving around using the car. Another interviewee describes how getting his driver’s license was a sort of ambition, which eventually led him to shift from cycling to driving. Others describe the need of getting a car at a young age because of social pressures and it being an important milestone in one’s life.

(7) *“I think it is peer pressure as well because when you're 18, you need to have the licence and then you need to have the car. At 18 years old you'll see it as your independence status quo.”*

5.2.4 Everyday changes

In addition to life event changes, participants described small changes in their daily lives that also influenced mobility. They state how their daily routines often changed and these changes inevitably were reflected in alterations in the way they travelled. One of the younger participants described how he prefers to use the bus to travel between home and university. However, since he became part of a musical cast, he had to change modes of transport because bus services were not operating at the time rehearsals finished. Another female participant preferred using a taxi rather than the bus, when busy and trying to get home early. Similarly, another participant described how he shifts from using the bus to car when he is running late.

(1) *“So now I'm using the car because of rehearsals that happen at 9pm, so there's no bus. I have to take the car otherwise I cannot get home. But otherwise I find the bus pretty comfortable.”*

Mobility among the participants also varied with weather conditions. This was most relevant to those travelling by bicycle or on foot who explained how they need to find alternative modes of travel when the weather is not good.

(5) *“I avoid cycling when it is raining as much as I can. I mean when it's pouring heavily.”*

The interviews described how the individuals integrated their mobility with their every-day routines. However, no two experiences were the same. Through their explanations, the participants gave an overview of their preferred mode, the route they take to reach their destination, the feelings or values they attribute to different modes of transport, concerns regarding safety and issues with travelling in an efficient way. Individuals also expressed how small daily changes have an impact on their daily mobility and conditions, including changes in weather, working hours or the schedule of other activities, result in the individuals re-evaluating or renegotiating their mobility practices.

6 Discussion

This study contributes to the body of research that adopts the theory of social practice to investigate mobility and transitions to sustainable forms of travel. The findings illustrate how this can be valuable in exploring and understanding mobility practices, how these are influenced by the meanings and values of the societal system and how they are embedded in everyday life (Watson, 2012). The results have important implications for studying everyday mobility and how, in the context of the study, some mobility practices prevail while others fail to recruit practitioners. The results emphasise how understanding shifts to sustainable mobility and initiating transitions to low-carbon forms of travel necessitate in-depth analysis of the complexity associated with transport practices (Larsen, 2017, Watson, 2012). In addition, the findings are also valuable in demonstrating that practice theory and the focus on everyday mobility is useful for capturing the dynamics of mobility at the individual level while also taking into account the influence of societal structure and cultural norms.

The analysis clearly reveals the car-dependent nature of travel on the islands, with most participants showing preference for car use over other modes of mobility. A closer look at the transition from car to more sustainable forms of travel require investment in elements of low-carbon forms of mobility, which are necessary for practitioners to engage in these forms of travel, yet are not available. For example, our findings reveal that the material elements for car use are available, but infrastructure

which enable travelling by means of active modes of transport are still lacking. In addition, relevant to any transitions in travel are the competencies and meanings that the individuals associate with different forms of travel. The results suggest that successful shift to alternative modes of transport needs a better understanding of all the elements of mobility and their interrelatedness. For example, in addition to the lack of appropriate infrastructure which hinders the uptake of cycling in Malta, our findings have shown that individuals also lack the necessary skills to start cycling or use this mode for their daily travels. This is evident from the narratives of some of the participants who feel they lack the skills or are afraid to cycle. The results are comparable to similar studies investigating cycling (Spotswood et al., 2015).

The findings presented here also suggest that meanings which individuals attribute to different modes are key in shaping what forms of mobility prevail over others. Promotion of the use of low-carbon forms of travel should be based not only on providing the necessary materials and skills but also address the meanings of mobility. For many of the participants, travelling by modes other than the car means sacrificing the advantages that car use brings. These include the feelings of independence, having access to personal space, travelling comfortably and having a pleasant journey. These implications of meanings to transport behaviour are often overlooked in transport policies which continue to place emphasis on rational and instrument factors for mobility. For example, the provision of a dense network of bus services to ensure that travel meets the individuals' need to be on time and travel in a fast manner is important in the promotion of bus use. However, other meanings of comfort and room for personal space, flexibility, cleanliness, and a means to be productive, are equally significant in the shift to bus-mode of travel. In terms of policy implications, our findings are important to show that transport planning needs to consider these wider meanings of mobility.

The analysis of the qualitative data was important to reveal how the organization of daily life and the dynamics involved in the everyday practices shape the choices around mobility. Individuals are constantly responding to conditions in which they live and work, and negotiating and organising how they travel. This manoeuvring through conditions of daily life becomes very evident from our study. The fixed timings for work and school, parental responsibilities, shopping and other activities shape the individual's choice towards one form of travel, and not the other way around (Shove et al., 2015b, Meinherz and Binder, 2020b, Iyanna et al., 2019, Spurling and McMeekin, 2014).

Similar to previous findings, our research has demonstrated that engagement in employment has a substantial impact on the recruitment to specific mobility practices (Cass and Faulconbridge, 2016, Guell et al., 2012, Meinherz and Binder, 2020a). The temporal and spatial constraints of individuals are reflected in mode choice. For example, in the context of Malta, the public transport system makes it difficult for people to travel by bus when compared to the perceived convenience of the car. This study has found that looking after children has important effects on travel, similar to others (Pooley et al., 2011, He, 2013) who have commented on the parents' role and the need to coordinate not only their activities but also tend to the needs of their children. Further to work and parenting, the practice of shopping, especially when shopping for grocery at large peripheral supermarkets, was also shown to encourage individuals to use the car (Berg and Henriksson, 2020, Mattioli et al., 2016).

The outcomes of the qualitative analysis of daily mobility is significant in demonstrating how individuals do not participate in mobility practices as individual agents. The experiences of the participants help to provide insight into how decisions about travel are made within the constraints of the social structure, household relationships, working schedules and the local physical infrastructure. Work influences how individuals travel, family structure limits the choices of the working parents, and the public transport infrastructure is too poorly developed to meet the spatial and temporal needs of everyday mobility. These factors which arise from the structural organization of social life have

important implication for mobility choices and are often missed by other quantitative analysis on travel choices. In this way, social practice analysis opens up new perspectives into those factors which contribute to the observed daily mobility and which have not been identified previously.

There are some limitations to the research. The study was drawn on a small sample of participants residing in Malta. As for all qualitative research, the aim of the study was not to produce representative or generalizable results. Rather the aim was to explore a range of understandings and interpretations of the motives behind mode choice which are deeply rooted in complex social structures. What is presented in this study are new, in-depth commentaries concerning those aspects which shape travel choices that become visible when practices are taken as the unit of analysis, the elements of different practices are revealed, and the demand for mobility created through the interaction of different practices.

While research of the type presented in this paper is valuable in providing new insights into mode choice, the challenge remains how these insights can be applied or translated into transitions frameworks. Insights about mobility practices can provide new perspectives for reflections on what can contribute towards a shift towards more sustainable mobility. Policies inspired by insights from the theory of social practice are expected to be different from the current transport policies since they build on the ideas that mode choices go beyond personal choice or environmental factors. Rather they are inspired by the idea that transport practices are shaped through the intersection of structure and agency. The following discussion will provide some points on how the findings can be used as a starting point in the design of interventions for transitions to low-carbon mobility within the context of this study. We suggest the following principles to be used in future transport strategy development in Malta:

Materials

- Infrastructure for public transport, walking and cycling needs to be of a much higher quality and journeys/routes made more direct than those carried out by the car, e.g. the car has to be made the least likely choice for travel.
- Public transport routes can be much more extensive, giving better accessibility and journey frequency. Journey cost for public transport can be reduced, perhaps even be free, or maintained at levels lower than car usage. The comfort of vehicles and ability to use time whilst travelling, e.g. for reading or accessing the Internet, can all make public transport more competitive.
- Walking and cycling facilities can be improved with extensive, high quality and safe networks provided, so that the benefits of active travel can be realised for all groups in society. This can involve short and longer distance door-to-door journeys and last and first mile connections to public transport. An extensive walking and cycling network can be planned and implemented. The most direct routes can be given to walking and cycling, so that there is filtered permeability by different modes and travel by car becomes longer in relative journey times. Tourist travel is particularly important on the islands, and this can be targeted for more sustainable travel behaviours, e.g. with key cycle routes provided around Valletta and key tourist destinations.
- Investment and promotion of car sharing facilities or implementation of Mobility as a Service (MaaS) options can help reduce car-ownership and fill-in the gaps where other forms of transport cannot effectively substitute car travel, such as in the case of the carrying function of the car.

Meanings

- The perceived higher status of the car needs to be tackled, with school education illustrating the benefits of sustainable travel options. Perhaps car advertising can be further regulated, and more thought given to marketing the benefits of using public transport, walking and cycling to different user groups.
- Policy interventions can start looking into the ways in which individuals value low-carbon transport modes. Promotion of cycling could focus on marketing this mode of travel as a low-cost and fast means of travelling. Cycling policy could also be linked with interventions in the promotion of public health.
- The public transport system can be enhanced to provide a more pleasant experience during the journey and start addressing important meanings related to travel, such as comfort, flexibility and reliability.

Competencies

- Training programmes for safe cycling, mentor cycle programmes and other programmes can seek to remove perceived obstacles to cycling.
- Leisure cycle routes, cycle purchase loans, bike sharing schemes, and Car Free Days can be extended so that cycling as a practice becomes more frequently used amongst wider groups.
- New apps can be designed that help people orientate around the island, including facilitating travel for disability groups.

Three further general points can be made. First, interventions should not simply be focused on the material aspects of mobility but should also account for the ways in which everyday mobility is valued and the social norms that constitute the organization of daily life (Cass and Faulconbridge, 2016, Shove et al., 2012, Watson, 2012). Second, mobility is embedded within the many social aspects of the daily life. The interlocking of mobility practices with other dynamics and the rhythm of social life suggests that policies that address mobility separately from other aspects of the social will not produce the required transition to sustainable mobility (Meinherz and Binder, 2020a, Cass and Faulconbridge, 2016). This suggests the need to address non-transport practices (Shove et al., 2015b, Spurling and McMeekin, 2014). Integrated policy making between transport and other sectors can be further explored to reduce the dependence on the car for carrying out specific social practices. For example, the intersection between transport and urban planning, education, employment and retail location and choice, and the activity routines of parents, have important effects on the modes of travel and could provide a new focus for integrative policy action.

Third, individuals are subject to changes that trigger the constant revision and renegotiation about travel decisions (Vergunst, 2016). These small changes may provide good opportunities to shift to more sustainable forms of mobility. Investments that promote teleworking amongst employers, for example, the introduction of reduced hours for adopters of low-carbon modes of transport are all options that reduce the stresses caused by the limited time for movement between sites of practices. Such interventions can facilitate the transition to lower-carbon forms of travel. Recent developments following the pandemic lockdown has provided ample opportunity to test some of these measures. Policies may start to focus on the ways in which low-carbon modes of travel can become more valued by the users who could start to re-evaluate their means of travel and choose to use different modes (Meinherz and Binder, 2020a).

This study has shown the importance of major life changes and their impact on travel choices. Most of these changes contributed to a modal shift towards the car. In parallel, transport research acknowledges that life changes are also opportunities for breaking habits and introducing more

sustainable choices (Ryley, 2006, Verplanken et al., 2008). The decline in car use amongst young adults in several countries (Kuhnimhof et al., 2012) can be seen as a point of intervention for the promotion of reduced dependency on the car. Young adults can be a target for policy initiatives, for example, interventions could focus on providing alternatives for the dominant path that sees adults acquire a driving licence and own a car. Providing young adults with different transport options can help them experience low-carbon forms of mobility and provide them an opportunity to shift in the future (Sattlegger and Rau, 2016).

7 Conclusions

Shifting to low-carbon forms of mobility, from a context of high motorization, such as that found in Malta, is likely to be very difficult. But, if we analyse travel behaviours from an in-depth understanding of social practices, then perhaps we can start to understanding the measures that can be most successful. This study has provided initial insights into the mobility practices in the islands of Malta, how these are shaped and influenced by other social practices and the performance of everyday life. Such insights are valuable in opening up new perspectives for reflection on the shift to more sustainable forms of everyday mobility.

Social practices, the constituent elements of which they are composed and the spatio-temporal rhythms in which they are organized, have an influence on the choice of travel mode – but these can be broken and changed. Giving a focus not only to the material elements of sustainable practices, but also to the competencies and meanings related to low-carbon travel, can be the strategy that brings together new approaches. Targeting non-transport practices to influence the transition to low-carbon mobility should also be the focus of interventions aimed at bringing more radical changes in transport transitions.

The results of this study are not meant to be a generalizable account on mobility practices or how a shift to sustainability can be initiated, rather they are aimed at demonstrating the potential of practice theory in informing policy makers seeking to induce societal transitions to sustainable mobility. Further research can examine the link between travel practices and visions for different ways of travelling and living, again using social practice as the theoretical framework for informing policy. The challenge for achieving sustainable travel is great, as motorization is so heavily embedded in everyday life in Malta. However, there are also many benefits arising from greater use of public transport, walking and cycling, and these become ever more evident as we carry out further and more in-depth research in this area.

Author Contributions

To be included later.

Acknowledgements

The authors have no competing interests to declare. This work was supported by the ENDEAVOUR Scholarship, Ministry for Education and Employment in Malta.

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