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Understanding the mobility behaviour of urban-rural tourists in response to different spheres of influence

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ABSTRACT

This dissertation examines tourism mobility choices of urban residents travelling to rural destinations in a time of intensifying debates on the global climate crisis. Rural, nature-based tourism represents a significant contributor to global emissions due to its car-dependency, which contrasts its role as a vulnerable sectors to the consequences of climate change. Therefore, investigating mobility choices in this context is a pertinent endeavour. This is done by means of a large-scale study conducted in Austria and contrasted with a case study undertaken in New Zealand. They represent suitable study contexts due to their picturesque landscapes as well as outdoor opportunities and the resulting climate sensitivity of their tourism industry.

This dissertation is based on six papers, which examine different aspects of tourism mobility in the context of urban-rural summer tourism. As such, it investigates the factors that influence mode and destination choices for urban-rural tourism trips and analyses the relationship between destination and transport mode choices. Drawing on Leiper's (1979) tourism model and the results of all six papers, a conceptual model of the tourism mobility system and the factors influencing it is developed. This theory-building is followed by a reflection and discussion on the suitability of the chosen methodological frameworks to account for the specific characteristics of mobility choices made in the tourism context. These research foci were approached by means of a mixed set of quantitative (mainly survey-based) and qualitative research approaches (focus groups and Q-methodology), integrating different theoretical and methodological perspectives such as the Theory of Planned Behaviour (TPB), Rational Choice Theory and research on tourism mobilities.

The results show that tourism destination and transport mode choices are interlinked and are both shaped by a number of (inter-)personal and situational influences as well as mode-specific trip characteristics and destination features. Concerning PT travellers, the modelling results highlight their relative indifference towards travel time and the importance of train (rather than bus) accessibility. They further show the importance of providing well-accessible and attractively presented information in order to become a viable tourist destination and to facilitate the ease of planning. Another important factor for both destination and mode choice is the availability of tourism and transport amenities in walking and cycling distance. The qualitative results illustrate the deeply engrained barriers to behaviour change. Examples of these are path dependencies (e.g. car ownership), experiential expectations (e.g. sense of achievement, enjoyment of nature, and quality time with family), information gaps, risk aversion and aversion towards some PT features.

This thesis concludes that the promotion of sustainable tourism mobility options to and within rural areas requires an in-depth understanding of target groups and their needs and experiential expectations in order to design attractive offers and be able to communicate them effectively. The actual implementation requires an increased institutional cooperation across regional boundaries to develop offers that promote the benefits of PT while actively addressing its challenges.

Keywords: *Mobility behaviour, sustainable tourism mobility, urban-rural tourism, destination choice, transport mode choice, mixed methods*

KURZFASSUNG

Diese Dissertation untersucht touristische Mobilitätsentscheidungen von StadtbewohnerInnen, die in einer Zeit der aktiven Debatte zum Klimawandel in ländliche Gebiete reisen. Während der ländliche, naturnahe Tourismus einer der anfälligsten Sektoren für die Folgen des Klimawandels ist, trägt er aufgrund seiner Abhängigkeit vom Auto gleichzeitig erheblich zu den globalen Emissionen bei. Daher ist die Untersuchung von Mobilitätsentscheidungen in diesem Kontext ein wichtiges Unterfangen. Dies geschieht mit Hilfe einer quantitativen Studie in Österreich, die einer Fallstudie in Neuseeland gegenübergestellt wird. Beide Länder stellen aufgrund ihrer attraktiven Landschaften und Vielzahl an Outdoor-Aktivitäten und der daraus resultierenden Anfälligkeit für die Folgen des Klimawandels geeignete Studienkontexte dar.

Die vorliegende Dissertation basiert auf sechs Publikationen, die verschiedene Aspekte der touristischen Mobilität im Kontext des Stadt-Land-Sommertourismus untersuchen. Dabei werden die Faktoren untersucht, die die Verkehrsmittel- und Destinationswahl für Stadt-Land-Reisen beeinflussen, und analysiert die Beziehung zwischen beiden Entscheidungen. Auf der Grundlage des Tourismusmodells von Leiper (1979) und der Ergebnisse aller sechs Studien wird ein konzeptionelles Modell des Tourismusmobilitätssystems und der Faktoren, die es beeinflussen, entwickelt. Auf diese Theoriediskussion folgt eine Reflexion und Erörterung zur Eignung der gewählten Methoden für die Abbildung von Mobilitätsentscheidungen im Tourismus. Diese Aspekte wurden anhand einer Mischung aus quantitativen und qualitativen Forschungsansätzen erarbeitet, wobei theoretische und methodologische Perspektiven wie die 'Theory of Planned Behaviour' und die 'Rational Choice Theory' und 'Tourism Mobilities' integriert wurden.

Die Ergebnisse zeigen, dass die Wahl von Reisezielen und Verkehrsmitteln miteinander verknüpft ist und von einer Reihe persönlicher und situativer Einflüsse, sowie verkehrsmittelspezifischer Reise- und Destinationsmerkmale geprägt wird. Für ÖV-Reisende zeigen die Modellergebnisse deren relative Gleichgültigkeit gegenüber der Reisezeit und die Wichtigkeit der Zug- (statt Bus-) Erreichbarkeit. Sie zeigen ferner, wie wichtig es ist, leicht zugängliche und ansprechende Informationen bereitzustellen, um als attraktives Reiseziel wahrgenommen zu werden und die Reiseplanung zu erleichtern. Ein weiterer wichtiger Faktor für die Wahl des Reiseziels und des Verkehrsmittels ist die Verfügbarkeit von Tourismus- und Transporteinrichtungen in Fuß- oder Raddistanz. Die qualitativen Ergebnisse veranschaulichen die tief verwurzelten Barrieren für Verhaltensänderungen. Beispiele dafür sind Pfadabhängigkeiten, Erfahrungserwartungen, Risikoaversion, Informationslücken, sowie eine Abneigung gegenüber einigen ÖV-Merkmalen.

Diese Arbeit kommt zu dem Schluss, dass die Förderung nachhaltiger Mobilitätsangebote zu und innerhalb ländlicher Tourismusdestinationen ein tiefgehendes Verständnis der Zielgruppen und ihrer Bedürfnisse und Erwartungen erfordert, um attraktive Angebote gestalten und wirksam kommunizieren zu können. Die tatsächliche Umsetzung erfordert eine verstärkte institutionelle Zusammenarbeit über regionale Grenzen hinweg, um Angebote zu entwickeln, die die Vorteile nachhaltiger Mobilität herausstreichen ohne die Herausforderungen außer Acht zu lassen.

Keywords: Mobilitätsverhalten, nachhaltige Tourismusmobilität, Stadt-Land-Tourismus, Destinationswahl, Verkehrsmittel-wahl, Methodenmix

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For me, this thesis represents more than just the words it contains: it reflects much of my personal development over the course of the past three years. Along this path, there were many people who have, in one way or another, contributed to the completion of this thesis project.

First and foremost, I would like to thank my supervisor, Astrid Gühnemann. While I have greatly benefitted from her insights and valuable feedback on my initial drafts, I am even more grateful for her open mind towards my plans and (sometimes fairly) wild ideas as well as her support of my various attempts to pursue research visits or courses abroad.

There are a number of other people who have provided great support or inspiration for this project. One of them is my co-supervisor Reinhard Hössinger who has also been my mentor and a good friend in this endeavour. This thesis wouldn't be anywhere close to this if it weren't for his critical questions packed in ceaseless encouragement. It was not only his statistical know-how and dedication to thorough research and data handling that contributed substantially to this thesis. More importantly, it was his humour and contagious laughter, seedless grapes and his sheer company in the office at 10 pm that made this entire process truly enjoyable. I would also like to thank Jean Boucher. The Erasmus+ exchange to Michigan State University in 2018 was a turning point for me, in large parts due to Jean's encouragement, enthusiasm and honest interest in my personal research interests and how they could be combined in a thesis. Ultimately, he convinced me to *really* pursue this dissertation. Thank you so much for this motivational push that came just when I needed it. Lastly, my thanks go to Michael Hall for his unexpected but invaluable support in the shape of inspiring conversations, detailed paper feedback and homemade chocolate cookies.

Furthermore, I would like to express my gratitude towards all team members of the REFRESH project, which has been the starting point of this thesis. I would especially like to mention Wiebke, Alexandra and Christiane: for their many creative ideas, valuable criticism and for encouraging me to write this thesis on our common project and leave some of my doubts behind.

My special thanks also go to the people who grew dear to me during my PhD exchange in New Zealand. All the late-night writing times, whiteboard drawing sessions, pub quizzes, Sri Lankan dinners and visits to the climbing hall made me feel so very welcome there. Thank you also, Helen and Shannon, for your countless insights, time and hands-on support as well as all your words of encouragement that made me learn more and helped me complete my case study. I cannot wait to see you all again, do a little walk across Forbes', show you my thesis and have some more cake.

And, well, there is a large group of people who have contributed to this dissertation more than they would ever know. Julia and my other (partly former) roommates, who spoiled me with great coffee, practical and emotional support, and distractions through sports, fantastic dinners or board game evenings when writing was no longer an option. Also to other friends, with whom I have enjoyed memorable (academic and not-so-academic) discussions that have surely influenced my way of seeing the world. I am so glad to have you! Lastly, I want to thank my parents and my entire family: for challenging my beliefs, for making me realize the bubbles we all live in, but also for reminding me that the 'actual' world outside academia matters plenty. And for loving me and always welcoming me despite the (sometimes heated) discussions we had over the years.

PREFACE

This dissertation emerges from my work as a junior researcher and PhD student at the Institute for Transport Studies at BOKU Vienna. Most of the analyses and resulting publications presented in this dissertation were carried out as part of the project 'REFRESH' that was funded under the 8th call of the Austrian Climate Research Funds (ACRP).

A thesis concerned with topics as vast as 'tourism' and 'transport' can surely not be covered in its entirety within a single monolithic empirical or theoretical study. In order to touch upon different aspects relevant to urban-rural mobility choices – concerning both the involved choice of destination and used transport modes - I chose a cumulative format by publications. Within this structure, articles make use of different theoretical and methodological frameworks depending on the thematic focus at hand. Ultimately, this cumulative dissertation contains six peer-reviewed publications (one published peer-reviewed book chapter, four published articles in SSCI-listed journals, and one submitted manuscripts). The author's contribution to each publication is listed in the 'Part II - Publications' section of this thesis.

The first section provides a contextualisation of rural, nature-based summer tourism destinations in Austria, investigates the factors motivating the intention to visit any of such destinations and discusses the challenges arising from the goal of providing accessibility to tourists in these rural places while also striving for sustainable regional and tourism development.

Paper I   Weber, F.; Juschten, M.; Fanninger, C.; Brandenburg, C.; Jiricka-Pürrer, A.; Czachs, C.; Unbehaun, W. (2018). 'Sommerfrische' in Times of Climate Change: A Qualitative Analysis of Historical and Recent Perceptions of the Term. In: Ohnmacht, T.; Priskin, J.; Stettler, J. (ed.): *Contemporary Challenges of Climate Change, Sustainable Tourism Consumption, and Destination Competitiveness.* Bingley, UK: Emerald Publishing Limited, pp. 7-23.

Paper II   Juschten, M., Brandenburg, C., Hössinger, R., Liebl, U., Offenzeller, M., Prutsch, A., Unbehaun, W., et al. (2019). Out of the City Heat—Way to Less or More Sustainable Futures? *Sustainability, 11(1), 214, pp. 1-23.*

Paper III   Juschten, M.; Jiricka-Pürrer, A.; Unbehaun, W.; Hössinger, R. (2019). The mountains are calling! An extended TPB model for understanding metropolitan residents' intentions to visit nearby alpine destinations in summer. *Tourism Management, Vol. 75, pp. 293-306.*

The second section investigates the sociodemographic, attitudinal, spatial and service-quality-related determinants of transport mode and destination choices in the context of urban-rural tourism trips in Austria by means of a spatial analysis of mode-specific travel patterns and a joint transport mode and destination choice model. This model combines quantitative survey data on travel demand with a range of additional data on tourism and transport supply.

Paper IV   Juschten, M. (2020). No car – no travel? Exploring tourism travel strategies of car-free Viennese households, *submitted to Journal of Sustainable Tourism.*

Paper V   Juschten, M., Hössinger, R. (2020). Out of the city – but how and where? A mode-destination choice model for urban-rural tourism trips in Austria, *Current Issues in Tourism (in Press, available online)*.

In the last step, the results are placed in an international context by investigating the notions underlying car usage in a urban-rural tourism context in New Zealand (VI). Combined with the findings of papers I to V, these results are used to develop a conceptual framework of influential factors shaping tourism mobility choices in an urban-rural tourism context.

Paper VI   Juschten, M.; Page, S.; Fitt, H. (2020). Mindsets set in concrete? Exploring factors influencing New Zealand's (auto-)mobility culture in the tourism context, *Sustainability, 12(18), 7646, pp. 1-21*.

It might be worth mentioning that this framework paper, which summarizes, discusses, and contextualizes the findings of all six papers, was largely developed throughout the outbreak of the COVID pandemic in the spring and summer of 2020. While this may seem like a far off or overly contemporary note, this global crisis did, in fact, shape some of my understanding of behavioural change capacities and pathways. In the blink of an eye, borders were closed, airports were shut down, and much of public life was brought to a stop. Countries around the globe were determined to do whatever it takes to 'flatten the curve' of infection spreading. The long-term economic, environmental, socio-political and psychological impacts of these extreme measures are wild guesses to date, and it is not my intention to discuss whether or how some of the negative consequences we may face could also be outweighed by positive secondary effects.

The point I would like to make instead: this crisis has shown me that we (as citizens and our socio-political institutions) are capable and possibly even willing of collaborating on a global scale (in terms of scientific cooperation) and adjusting our collective lifestyle very quickly if the urgency requires it. However, with regard to climate change, it has also made me wonder whether societies can bring about a possibly uncomfortable change without the need for an immediate crisis and disruption. Milton Friedman seems to doubt this, in his view:

> '*Only a crisis - actual or perceived - produces real change. When that crisis occurs, the actions that are taken depend on the ideas that are lying around. That, I believe, is our basic function: to develop alternatives to existing policies, to keep them alive and available until the politically impossible becomes the politically inevitable*'.

Friedman, as a convinced free-market capitalist, would surely have drawn other conclusions on who should develop these ideas based on which sources of funding compared to advocates of stronger governmental intervention. Surely, climate change is not a temporary disease. Its effect may surface more slowly, and it may require more systemic, far-reaching and continuous action at a global scale to develop alternative solutions to our current lifestyle with its destructive levels of global emissions and resource exploitation. To end this with some words of optimism, maybe this thesis – together with past and future research still needed - can contribute little pieces to the development of such alternatives, whether it needs a crisis or not for them to be picked up.

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LIST OF ABBREVIATIONS, TABLES AND FIGURES

Abbreviations

DCM	Discrete choice models
EV	Electric vehicles
PBC	Perceived Behaviour Control (element of the TPB, see below)
MNL	Multinomial logit
NZ	New Zealand
PT	Public Transport
RQ	Research question
SEM	Structural Equation Model
TPB	Theory of Planned Behaviour
UNWTO	United Nations World Tourism Organization

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PART I -

RESEARCH SUMMARY

Chapter

INTRODUCING THE
RESEARCH PROJECT

This section wishes to introduce the reader to the overall problem addressed in this thesis and the spatial context it is embedded in. Drawing on insights from tourism and transport research, it illustrates the current unsustainability of tourism mobility between urban origins and rural destinations and the various approaches that exist to better understand tourism behaviour. In doing so, it outlines existing research gaps, which finally lead to the formulation of research questions and research structure guiding the work undertaken throughout this thesis.

1.1   Defining the problem – tourism behaviour changes in the context of climate change

Climate change is a major global concern and one of the key policy challenges of most developed countries (Hall et al., 2015). In relation to this, we can observe a wide-spread academic debate on how behaviour change towards increased sustainability can be achieved to promote climate change mitigation (Hall, 2016; Becken, 2019). Among the various affected sectors, tourism is one of the ones most vulnerable to the consequences of climate change, while at the same time driving it (Scott et al., 2012).

For some destinations, this results in various economic and social risks and constraints. For others, these changes may also constitute a positive resource or new pull factor for increasing tourism demand (Njoroge, 2015). This could be the case for tourists choosing pleasantly-tempered destinations instead of over-heated urban areas as a form of climate change adaptation (Pröbstl-Haider et al., 2015). However, the possibility that some destinations may benefit from these changes does not represent a plea for any kind of do-nothing approach. On the contrary, many destinations are likely to face severe consequences from climate change that imperil both livelihoods and economic activities (Landauer et al., 2012; Falk, 2014), creating the need for effective mitigation measures.

Such mitigation measures are particularly relevant in light of the role the tourism industry holds as a driver of climate change (Scott et al., 2012; Lenzen et al., 2018; UNWTO & ITF, 2019). Among the different tourism services, transport is the largest contributor to the output of CO_2 emissions, estimated to produce 75% of all tourism-related emissions (UNEP et al., 2008; Scott et al., 2016; UNWTO & ITF, 2019). While the share diverges depending on the services and goods attributed to the tourism sector, there is a consensus that transport-related emissions will continue to grow (Lenzen et al., 2018; UNWTO & ITF, 2019). In the context of domestic tourism in Europe, the car is responsible for 69.6% of all transport-related emissions (UNWTO & ITF, 2019, p. 41). This is driven by a strong automobility culture, in many especially rural areas, which represent an important and increasingly appreciated market for urban tourists seeking nature-based tourism experiences (Boller et al., 2010; Woods, 2011). The frequent car use produces additional negative externalities on rural communities such as noise, pollution and congestion (Dickinson & Robbins, 2008; Guiver et al., 2013). These problems are exacerbated by people's desire for increasingly personalized and spontaneous as well as shorter and more diversified vacations (Held 2013). This represents a challenge to the goal of many governments, including Austria, to increase the use of sustainable transport modes for tourism trips (BMLRT, 2019).

Finding solutions to these problems seems unavoidable when considering the current unsustainability of tourism mobility combined with the inherent necessity of transport for tourism (Gronau & Groß, 2019). This is intensified by the importance of the tourism sector at various scales and the growth it has experienced over the last decades (Lenzen et al., 2018; Becken, 2019; UNWTO & ITF, 2019). In the countries studied within this dissertation - Austria and New Zealand (NZ) - the tourism sector is also of undeniable relevance for both economic reasons (significant GDP contribution, employment, and support of indirect sectors, see Stats NZ, 2019; WKÖ, 2019) but also because of related societal benefits especially for rural areas (preventing rural depopulation and maintaining healthy communities, see Bricker, 2017).

To promote an increase in sustainable travels, a more thorough understanding is needed of the factors influencing individual decision-making and behavioural change under the influence of climate change (Gössling et al., 2012). When comparing the behaviour change potential of stakeholders involved in the tourism system, the individual traveller holds a key role due to their flexibility and relative independence in their decision-making (Gössling et al., 2012; Rutty & Scott, 2016). However, convincing travellers to use more sustainable travel modes is not necessarily a matter of good (or rational/functional) arguments (Sirakaya & Woodside, 2005). Much rather, it is a matter of understanding the complexity of human decision-making (see Rasouli & Timmermans, 2015) and the internal and external factors that affect decision-making and, subsequently, behavioural change. This is especially relevant in the tourism context, where decisions are often taken collectively with other people (Bronner & de Hoog, 2008) and are complex because of spatially and temporally dispersed and partly unknown choice elements (Guiver et al., 2007; Cohen, Higham, et al., 2014). Additionally, tourism decisions are strongly shaped by experiential expectations (Hannam et al., 2014) and promotional messages (Sirakaya & Woodside, 2005). Travellers aim to increase positive feelings of fun, family time or adventure while trying to maintain a sense of control, thereby reducing stress, risks and uncertainty (Karl, 2018).

Literature at the intersection of tourism and transport has been steadily increasing but is still rather scarce (Hopkins, 2020), despite previous research highlighting the *'symbiotic relationship'* of both fields (Page et al., 2009). Notable exceptions exist, including various studies investigating the impact of transport infrastructure on destination choices (Duval & Schiff, 2011; Gronau, 2017; Rehman Khan et al., 2017; Castillo-Manzano et al., 2018) or the impact of destination features on transport mode choices (Marrocu & Paci, 2012; Le-Klähn & Hall, 2015; Gutiérrez et al., 2019). Most of these studies, however, focus on either mode or destination choice, with few studies analysing them in a joint manner (LaMondia et al., 2010; Masiero & Zoltan, 2013; Le-Klähn et al., 2015; Gutiérrez & Miravet, 2016). Given this research gap, the study of the relationship between both choices and the factors influencing them is a key objective of this thesis. This analysis will be done for urban-rural summer trips, an under-researched study context so far (Gon, 2017).

Within tourism and transport research, a wide range of consumer behaviour theories and models is used to study mode and destination choices (Sirakaya & Woodside, 2005 and section 3.3 for an overview; see Lanzini & Khan, 2017). Within these theories and models, a multitude of demand-side, supply-side and situational factors is used to explain the different choices made by travellers (Chien et al., 2012; Hannam et al., 2014; Le-Klähn et al., 2015; Gutiérrez & Miravet, 2016). Depending on the method and study focus, they typically include some of the following factors: (i) person/household characteristics, (ii) available mobility tools, (iii) attitudes, norms and values towards transport modes and destinations, (iv) travel motivations (v) experiential expectations, (vi) situational characteristics, (vii) trip attributes for available transport modes, and (viii) destination features (see section 3.3 for a list of influential factors). Given the restrictions related to common methods of data generation (quantitative surveys typically focussing on quantifiable factors vs. qualitative interviews studying narratives and perceptions and their respective values, worldviews and choice mechanisms) and the underlying paradigms of different disciplinary

fields, no comprehensive model on choice factors of tourism mobility can be established when applying a single methodology. To obtain a more holistic picture of driving forces of mobility choices in the summer tourism context, this thesis uses a mixed-methods approach that considers a wide range of the factors mentioned above.

1.2   Research questions and connections between papers

In light of the research gaps outlined in the previous section, the key objective of this thesis is to integrate these two decision fields – tourism destination and transport mode choices – which are often treated separately by both tourism or transport researchers. As such, the first aim of this thesis is to gain a deeper understanding of the factors influencing decision-making in the fields of transport and tourism, drawing on previous research from a range of different theoretical perspectives and methodological approaches. This first aim is represented by the following three research questions (RQ):

RQ1:   Which factors influence mode and destination choices for urban-rural tourism trips?

RQ2:   How can the relationship between destination and transport mode choices be described?

RQ3:   Which internal or external factors encourage or constrain changes in tourism behaviour in response to climate change effects or debates?

The second overall aim is of more methodological or conceptual nature. This thesis aspires to discuss the contributions of different behavioural concepts, theories and methods to foster an integrated understanding of tourism mobility choices. This is addressed by the following question:

RQ4:   How can different theories and methodological approaches be integrated to enhance the understanding of urban-rural tourism mobility choices?

These questions are addressed by means of empirical evidence using a mixed set of qualitative and quantitative research approaches (Goal 1, see Figure 1). In an initial step, desk research and focus group discussions were performed to identify the specific characteristics of the chosen study context (Paper I). Drawing on these insights, a large-scale quantitative survey was conducted in the source market of Vienna. These survey data provided the basis for the destination-choice-oriented analyses using a-posteriori segmentation analysis (Paper II) and exploratory structural equation modelling (Paper III). To gain further insights into mobility patterns and the relationship between destination and mode choices, further data on public transport (PT) and car trip characteristics as well as destination features were needed. They were gathered from external sources and merged with the original survey data. The combined dataset was used for the analysis of spatial travel patterns (Paper IV) and the development of a combined mode and destination choice model (Paper V). In a last step, a Q-methodology study was conducted in New Zealand to generate insights into the notions of automobility in urban-rural tourism and how they affect the willingness to change to more sustainable travel options (Paper VI). Based on the results of all six papers (mainly drawing on insights from Paper V and VI), a conceptual model of the tourism mobility system and the factors influencing it has been developed (Goal 2, see Figure 1). This theory-building process is followed by a discussion of the suitability of the methods used to account for the characteristics of choices made in the tourism context (Goal 3, see Figure 1).

Figure 1 below illustrates the research structure including the three research goals and the relationships between all six papers. As mentioned before, this thesis uses Austria and New Zealand as case study countries, with Vienna and Christchurch being the investigated source markets. They represent a suitable context for the study of urban-rural tourism mobility due to their economic reliance on the tourism sector and a tourism portfolio largely influenced by rural, nature-based and therefore climate-sensitive summer destinations.
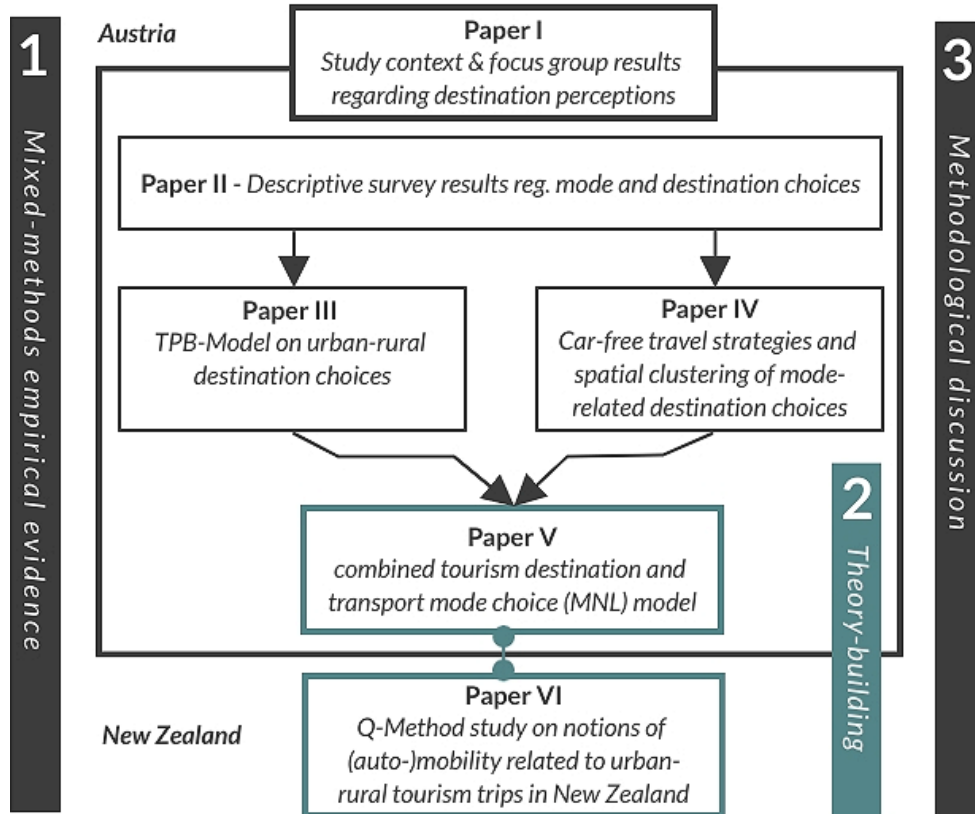
Figure 1: Structure of research questions and papers

The original contributions of this work is based on three different elements: First, *the research context* of urban-rural tourism mobility under the influence of climate change is still under-researched (Gon, 2017), with most studies focussing on either the origin or the destination but not the combination of both. Additionally, few studies exist with Austria's domestic summer tourism as a case study (Lane & Kastenholz, 2015). Therefore, this context shall be addressed with an exploratory approach, especially in light of the influences of climate change. Second, this thesis generates *theoretical insights* with regard to the relationship between tourism and transport decisions and the factors influencing them. The combined results generated throughout this mixed-methods approach will be incorporated into a conceptual model of tourism mobility choices in the urban-rural tourism context. Third, based on the various qualitative and quantitative methods applied, this thesis critically examines the *suitability of different research paradigms and methodological approaches* for investigating tourism decisions with their specific characteristics.

Based on these contributions, this thesis ultimately aims to identify possible leverage points for tourism-related behavioural change in response to climate change through policy or planning suggestions that take into consideration the complexity of individual tourism mobility choices.

This thesis is structured as follows: The following chapter delineates the research context of urban-rural tourism movements and the resulting mobility-related challenges. Chapter three provides a theoretical background on existing theories aiming at explaining tourism mobility choices and on the various objective and subjective influence factors they consider relevant. Chapter four elaborates on the methods applied within the six papers included in this thesis, with their respective results being briefly presented in chapter five. The discussion of all papers' findings in relation to the four research questions is presented in chapter six, with main contributions and further research needs outlined in chapter seven.

Chapter

DELINEATING THE
RESEARCH CONTEXT

This dissertation focuses on tourism originating in urban areas and directed at predominantly rural, nature-based destinations. This section starts off with a brief account of the aspects motivating town dwellers to explore rural landscapes. Drawing on some of the inherent spatial and demographic characteristics of many rural destinations, it then continues to discuss the mobility/transport-related challenges associated with rurality.

2.1 Urban-rural tourism mobility towards nature-based destinations

As outlined before, nature-based tourism destinations in rural areas represent a particularly conflicted and therefore relevant case study. On the one hand, they rely more than other types of destinations on a healthy climate and biodiversity and may even represent an attractive escape from hot and dense cities in response to increasing urban heat occurrences (Pröbstl-Haider et al., 2015). The demand for unspoiled nature is expected to grow further caused by increasing shares of urban populations around the globe and the related scarcity of open landscapes and other positive aspects associated with rural, nature-based tourism (Held, 2013; Holden & Lupton, 2017). On the other hand, due to their often peripheral, hard-to-access locations, rural destinations also drive climate change and perpetuate unsustainable tourism and transport practices (Ravazzoli et al., 2017; Smith et al., 2019).

Among the different visitor groups of rural destination, city dwellers are a particularly relevant target group due to the size of this market and their desire for unspoiled natural settings (Schirpke et al., 2018). In many European countries, city dwellers have an above-average affinity towards PT, combined with lower than average rates of car ownership (Fiorello et al., 2016). This is caused by the density and limited availability of urban space that restrict car ownership (see for example Buehler et al., 2017). However, it seems that even PT-affine or car-free urbanites revert to car usage when visiting rural or alpine destinations (Imhof et al., 2009; Juschten et al., 2017). This may be caused by the actual or perceived lack of PT alternatives in rural areas or the involved complexity for trip planning and conduction (respectively, the reduction in freedom and flexibility). Nevertheless, we assume this group to hold high potential for change of behaviour given the relative habit-freeness of this behaviour. Therefore, they are a central focus of this study.

Urban-rural tourism trips are not solely an Austrian phenomenon. As Woods frames it, '*For as long as carts have rolled into cities from the countryside laden with crops and fuel and stone, there have been pleasure-seekers who have headed in the other direction, into the country, to hunt, play, stroll, bathe, and escape the pressures of urban life. The idea of the rural as a space of production (...) has always had a mirror in the similarly powerful idea of the rural as a place of consumption, particularly as a location for leisure and recreation*' (Woods, 2011, 92). Especially in China, an extensive body of literature exists on the drivers of urban-rural tourism, the cultural dimensions of rural tourism (Su, 2011), and its social and economic implications. These developments are believed to provide sustainable livelihood options outside of crowded cities, thereby reducing the large economic gap between the urban and the rural (Su, 2011; Liu et al., 2017), a dichotomy that is found in many countries of the Global South (Gon, 2017; LaPan, 2017). Also, in the European and American context, studies show that rural tourism is a wide-spread and intensifying phenomenon that matters specifically in the context of increasing urbanization, which is accompanied by a strong disconnection of people from nature and the economic divide between both regions (Gon, 2017; Holden & Lupton, 2017). In much of the past centuries, the 'consumption of rural space' and the mobilities related to them was an Elitist privilege (e.g. 'Sommerfrische' in Austria) (Sheller & Urry, 2006). Only with the increasing availability of transportation and related mass tourism in the second half of the 20th century (Prideaux, 2009), (rural) tourism became accessible to the wider public.

2.2 Characteristics of the 'rural' and motivations for urban-rural tourism trips

While urban-rural tourism mobility is an under-researched topic, many studies can provide insights on the characteristics and drivers of rural tourism and how this relates to the heavy car usage found for this kind of trip. The subsequent section will present some of these insights.

Despite the (physical and likely also cultural) dichotomy between urban and rural slowly blurring (Gon, 2017), Woods (2011, 3) argues that the urban-rural divide constitutes '*one of the oldest and most pervasive of geographical binaries*'. There are various functions and meanings attached to rural places, even though the importance given to this distinction may not actually reflect the dynamic changes of cultural or social realities. Rurality is commonly associated with a traditional way of life that may be considered backward, ignorant or underdeveloped by urbanites. In this narrative, rural people are represented or perceived as a personified antagonism to modernity (Su, 2011; Woods, 2011). Despite these negative connotations, this backwardness or remoteness also relates to people's fascination for wilderness, calmness, simplicity and a certain type of authentic (possibly romanticized) idyll not to be found among the fast-spinned, technology-driven modern life in many cities (Su, 2011; Woods, 2011; Zolfani et al., 2015). As a result of these interactions, tourism creates a vivid exchange of both visible and invisible resources (e.g. knowledge, culture, money) between the urban and the rural (Gon, 2017).

The range of motivations for such urban-rural trips includes a wide range of possible motives. Among others, they include the desire to experience or connect to nature (Dickinson & Robbins, 2008; Holden & Lupton, 2017), the search for cultural or culinary authenticity (Gon, 2017), the desire for remote places (Boller et al., 2010) or the wish to visit family, friends or second homes (Juschten et al., 2017). Woods (2011) understands rural tourism as a multi-sensory experience that connects the physical, mental and emotional experiences in the consumption of landscapes. By connecting travel motives (or the experiences travellers seek) to human senses, he provides a deeper understanding of the attributes of the rural that are being desired and consumed by (predominantly urban) travellers. According to Woods (2011), these dimensions are:

– The visual: referring to the enjoyment of scenery (seeing far and to/from high up), wildlife or sightseeing (Holden & Lupton, 2017). The visual is not only an intrinsic travel motive but a socially constructed process of *what* we see. As such, destination images are often shaped by pictures conveyed through social media, often adjusted to transport the desired feeling.
– The auditory: referring to the absorption of tranquillity in the sense of an absence of human-made noises, wildlife or other sounds of nature.
– The olfactory and gustatory: referring to natural smells and the consumption of traditional, fresh and locally produced food, which may be related to feelings of nostalgia.
– The tactile/corporeal: referring to the consumption of terrain and its palpability through physical experiences such as hiking, mountain biking, swimming or any other activity.
– The aural: referring to the enjoyment of an intangible atmosphere, such as fresh air, comfortable temperatures and climate, as well as the feeling of solitude and spirituality.

2.3 Mobility aspects of urban-rural tourism movements

The travel motives or type of experiences or feelings people seek on their trips towards rural areas – and the supply-side characteristics that this remoteness and tranquillity entails, are two among

many possible factors affecting the transport mode choices of travellers. The following section outlines how these and other spatial and temporal characteristics relate to common transport challenges in a rural tourism context. According to Šťastná and Vaishar (2017) the availability and design of PT networks represent one of the greatest disparities between urban and rural places, a cultural clash that strongly affects the transport choices of urban travellers.

Drawing on the characteristics of 'the rural' outlined in the previous section, rural nature-based tourism destinations can be characterized by a lack of spatial and infrastructural density (Dickinson & Robbins, 2008). Accordingly, many tourist attractions are dispersed and are located in remote, mountainous or less accessible locations (Le-Klähn & Hall, 2015). Combined with a spatial concentration on single-entry/exit road networks and a temporal concentration of travel flows on specific arrival days or seasons, rural places often face a number seasonal transport problems. These include congestion, noise and a lack of parking within destinations (Dickinson & Robbins, 2008) and secondary effects such as changes in landscapes (Smith et al., 2019).

While this may sound like a favourable aspect for the development of PT alternatives, this is usually not the case. In most destinations, the spatial dispersal of tourist attractions is hard to combine with time- and cost-efficient PT systems. Many attractions are not necessarily located along existing PT routes, that typically only connect major regional centres or cities (Smith et al., 2019). From a destination perspective, the development of attractive PT networks is too costly, especially if they only benefit tourists with their selected set of interest points and hardly predictable scattering of arrival times and accommodation locations (Hopkins, 2020). From a travellers' perspective, these factors result in a limited PT accessibility of rural destinations (Šťastná & Vaishar, 2017; Smith et al., 2019) and increased risks when performing such trips by PT. This process is further intensified by slow deconstruction or thinning out of the existing rail network, leading to a further increase in car dependency for travels to rural areas to be able to get there and be flexible when travelling within the destination. As a result, cars are most often the favoured transport mode, for both tourists and the local population (Le-Klähn & Hall, 2015).

For the local population in rural communities, the wide-spread availability of automobility represents are both a well-accepted collective need and a curse. While cars are believed to be the only guarantee for sufficient personal mobility (Dickinson & Robbins, 2008), this also reinforces an automobile culture (in terms of infrastructure, technologies and societal norms and discourses) for both residents and visitors of the respective community (Hopkins, 2020). Finding alternative ways to move tourists is a desirable objective, often not for global environmental reasons but to improve or maintain the residents' quality of life (which, ultimately, also attracts future tourists) and to reduce the tourism-related local travel problems mentioned before (Smith et al., 2019). One of the problems related to respective policy and practice changes is the lacking problem awareness of travellers. Dickinson and Robbins' (2008) study on representations of transport problems in a national park in the UK points out that rural transport problems do not seem as severe when coming from a crowded urban setting, which decreases the likeliness of travellers changing their behaviour. Cocolas et al. (2020) contest this relationship; their study found that awareness of environmental (or any) effects does not inevitably lead to changing behaviours. This aspect will be discussed in a later section of this thesis, conjoined with a discussion on other potential drivers of change towards more sustainable behaviours.

Chapter

DESCRIBING THE
CONCEPTUAL FOUNDATIONS

This section first introduces relevant terms and definitions used within this dissertation. It then continues to delineate the specific characteristics and resulting behavioural aspect that distinguish the tourism context from all-day life travel contexts. This is followed by an overview of some theories and related methods commonly applied in the investigation of both tourism destination and transport mode choices and by a presentation of existing work on joint analytical approaches. Assuming this interconnectedness, this section finishes by outlining the various factors that influence both decisions.

3.1 Relevant terms and definitions

This dissertation is placed at the intersection of two research fields, transport and tourism. To ensure a common understanding of all readers, the most relevant terms will be defined as follows.

Based on the definitions of the United Nations World Tourism Organization (UNWTO), this thesis defines *domestic leisure tourism* as all those leisure-related (non-business) trips within the country of residence of the visitor but outside the traveller's usual environment. The definition of the borders of the 'usual environment' can for example be based on travel time (Smith et al., 2019) or distance (as adopted in New Zealand, which set the threshold at 40km outside the usual environment, see Stats NZ, 2019). For matters of comparability between both countries, the NZ definition is adopted here. Diverging from the UNWTO definition, the trips analysed in this thesis as 'domestic tourism trips' include both day and multi-day trips. Within the tourism system, *tourism destinations* are a key analytical unit represented by both individual and institutionalized stakeholders. While normally understood as 'the place a traveller visits', this thesis does not use the term in a strictly spatial way. Given the methodological mechanisms of the used choice models, destinations are treated as bundles of characteristics.

Urban-rural tourism movements describe visits of urban residents to rural destinations in at least day trip distance (more than 40km) and they are at the heart of this thesis. In the Austrian context, these type of destinations used to be subsumed as 'Sommerfrische' destinations, referring to rural places in proximity to metropolitan areas that are characterized by fresh air, beautiful sceneries and cooler temperatures in the summer (see Juschten et al., 2017). 'Sommerfrische' (also translated to 'summer retreat destinations') was the focus of the research project, during which the quantitative survey underlying most of this dissertation's work was developed. The papers studying destination choices and travel motives (I, II, III) use 'Sommerfrische' as their study context. The papers covering transport mode choices (IV, V, VI), on the other hand, define the study context in a more spatially-descriptive way, focussing on the features of 'Sommerfrische' destinations relevant to transport choices (hence: the connection between urban origins and dispersed rural destinations subsumed as 'urban-rural tourism movements').

Sustainability, frequently defined as a development path that '*meets the needs of the present without compromising the ability of future generations to meet their own needs*' (WCED, 1987 Art. 49) is a contested and widely disputed matter (Hall et al., 2015). The frequently used visualisations of the three equally-sized intersecting circles (Venn diagram) or three isolated pillars representing the economy, society and the environment is rather problematic. They suggest the equal importance of all three dimensions within sustainability pathways (Hopkins, 2020). Alternatively, one could argue that sustainability refers to the task of society and the economy (as 'beneficiaries' of the environment) to protect the latter for its own sake, while sharing resources in a way that they provide well-being to all parts of society. Given these ontological differences, this thesis applies the understanding of the 'Doughnut Economics' concept by Raworth (2018). It assumes sustainability to take place between the boundaries of minimum human needs (e.g. food, health) and upper planetary boundaries (see Steffen et al., 2015).

In this context, this dissertation defines *sustainable tourism* as those practices that encourage local, short-distance tourism with the focus on minimizing the use of resources while

simultaneously supporting the cultural and societal integrity of local communities within the destinations (Hall et al., 2015). ***Sustainable transport***, on the other hand, refers predominantly to those practices that encourage active mobility (walking, cycling) for short distances and within destinations and the use of public, shared or electric transport means (as in PT, on-demand bus systems, carsharing, e-mobility) for longer distances (Holden et al., 2020).

3.2   Characteristics of destination and transport mode choices in a tourism context

At the intersection of tourism and transport, two decision types are of high interest: destination choices (*'where to go'*) and transport mode choices (*'how to get there'*) (LaMondia et al., 2010). Ironically, Woodside (2017, 145) argues that especially at the intersection of tourism and transport, ' *"destination choice" need not to be the prime issue*' because of the intrinsic enjoyment of some types of trips without the need for pre-choosing a specific destination (see also Lamont, 2008). However, this seems to affect only few travellers (e.g. cycling tourism) and even for those the ease and quality of destination accessibility by chosen mode still matters, which is why this thesis focuses on both decisions.

Transport mode choices are generally approached in different (methodological) ways compared to destination choices because of diverging functioning mechanisms. Transport mode choice models usually produce negative utility values, because of the desire of travellers to minimize the 'costs' related to trips (in financial terms but also regarding travel time and hassles related to the trip), hence producing an *indirect utility* or derived demand (Banister, 2008). If travelling involves such a negative utility, one could ask: why not stay at home? The reason is assumed to be 'hidden' in the travel motive since they must expect a positive outcome (=utility) from going to their aspired destination. Hence, the sum of positive utility generated from the anticipation of travel planning and from the expected travel experience must offset the negative utility created by time, money and energy spent on travelling. With regard to influential factors, transport mode choices, especially in the context of daily trips, are assumed to be largely (surely not exclusively) driven by instrumental factors, including time, costs, reliability and comfort (Lanzini & Khan, 2017).

Destination choices, on the other hand, usually produce positive utility values or a *direct utility* resulting from the intrinsic value of traveling (Guiver et al., 2007). Hence, the chosen option is the one with the highest benefit among the different alternatives (Wattanacharoensil & La-ornual, 2019). Throughout the choice of destination, people are assumed to be strongly influenced by affective, experience- or image-oriented motives, for which different alternatives are much less interchangeable than in a transport context. Wattanacharoensil & La-ornual also highlight the various forms of bias that affect destination choices and perceived accessibility, including heuristics (the role of 'image') or the framing effect (persuasibility by media).

However, transport mode choices also function differently in a tourism context than in a habitual, well-known all-day life context. Due to the dynamically changing nature of underlying preferences (Cohen, Prayag, et al., 2014) and the bias towards risk and uncertainty avoidance (Sirakaya & Woodside, 2005; Karl, 2018), they may be less well-represented by classical utility-based optimization models targeting a minimal negative utility. While not intended for that purpose, Kabanoff's (1982) 'list of leisure needs' helps identifying and classifying the ways in which mobility decisions in a tourism context diverge from all-day life contexts. Table 1 below

illustrates a condensed version of these leisure needs and how they may affect tourism-related decision-making by shaping travel motives and experiential expectations related to the trip.

Table 1: Kabanoff's list of leisure needs and their influence on the characteristics of the tourism context

Leisure need	Influence on characteristics of tourism-related trips
Autonomy, leadership	Desire for flexibility, freedom, sense of control and spontaneity regarding travel routes and timing (Hannam et al., 2014)
Relaxation	Desire to reduce the stress and potential unexpected disturbances involved in complex trip planning procedures (Sirakaya & Woodside, 2005; Karl, 2018).
Family activity and social interaction	Transport and destination choices are both collective with more than one decision-maker (Bronner & de Hoog, 2008) and desire for privacy/intimacy within travel group (Hannam et al., 2014)
Escape from routine and search for stimulation	Destinations as often non-familiar settings (Guiver et al., 2007), where the trip can be considered both a fun experience in itself (with more affective or symbolic motives involved in the mode choice (Wattanacharoensil & La-ornual, 2019)
Skill utilisation / competition / challenge / health	Doing something exceptional, unprecedented (Correia et al., 2013)
Esteem, show others	Role of persuability and identity (Hibbert et al., 2013) or personal lifestyle (Cohen et al., 2015) as decisive factors in mobility choices

Compared to daily or commuting trips, tourism-related trips are more collective, since travels usually involve other travel parties (Bronner & de Hoog, 2008; Dickinson & Robbins, 2008), therefore increasing the number of opinions and preferences to be considered. Cohen et al. (2014) also highlight the increased complexity of the tourism context caused by the large magnitude of – spatially and temporally dispersed - decision elements (i.e. itinerary, activities, accommodation) within tourism choices, which are also under a strong influence of situational aspects (e.g. weather, tired kids) and resulting unexpected adjustments. This may coincide with cognitive overloads due to the amplitude of information influx (Wattanacharoensil & La-ornual, 2019).

A potential lack of familiarity with a destination and its local PT network might increase the level of uncertainty and consequently stress involved in the decision, a factor that travellers try to minimize (Sirakaya & Woodside, 2005; Dickinson & Robbins, 2008; Karl, 2018). One could, however, contest the notion of unfamiliarity stressed by Guiver et al. (2007) by arguing that travels have become a common element of most people's lifestyles (see Cohen et al., 2015). This could theoretically apply to the destination choices made by domestic Austrian travellers since many of them are familiar with the visited rural areas due to family ties or trips in the past. However, the same familiarity does not necessarily apply to PT as a transport mode option for visits to rural places. Unlike for urban commuting trips, urban tourists visiting rural destinations, actively seek attractions that are remote and hard to reach, therefore requiring a high level of spatial and temporal flexibility that is difficult to combine with PT (see Boller et al., 2010).

3.3 Representation of destination and mode choices in selected theoretical approaches

Many scientific fields have contributed to the theoretical and methodological progress in understanding tourism-related destination and transport mode choices. Among them are sociology

and psychology, which focus on the behavioural motivators of individual choices, especially in the context of sustainability-related choices. Inspired by these fields, much tourism and transport research grounds its work in behavioural and attitudinal theories such as the Value-Belief-Norm Theory, Norm-Activation Theory or the Theory of Planned Behaviour (Lanzini & Khan, 2017). Economics and related econometric models offer another strand of theories and methods to study tourism and transport choices, which often relies on models based on the Rational Choice Theory. By believing in an objective reality that can be understood through the deductive and empiricism-based mechanical principles of natural sciences (Hopkins, 2020), they often neglect the various behavioural biases mentioned before (Wattanacharoensil & La-ornual, 2019). Restricted by the available methodological approaches, they also neglect the fluidity of behavioural patterns and the strong interconnectedness of various influence spheres (Sheller & Urry, 2006). While more critical and qualitative approaches outside transport modelling fields (such as the 'new mobilities paradigm', see Sheller & Urry, 2006) do take these aspects into account, classical economic approaches continue to be of value for transportation and tourism research. This can be attributed to their relevance for respective policy and planning fields that often require transferable and representative data even though the focus of transport analysis has changed from predicting (and satisfying) demand as a static system to understanding the factors influencing it (Gronau, 2014). For this reason, socio-psychological and attitudinal aspects of mobility choices have gained in importance within transport research (Gronau, 2014).

Tourism-related destination and transport mode choices

A frequently used model type for explaining transport mode choices are discrete choice models (DCM) in their many variations (logistic regressions, multinomial logit models or similar version such as nested logit or mixed logit, see Bhat, 1998; LaMondia et al., 2010; or Ortúzar & Willumsen, 2011 as an overview; Schmid et al., 2019). The models used to study destination choices are less straightforward and more diverse. Possible modelling approaches include spatial interaction models (see LeSage & Pace, 2010), structural equation modelling (Sirakaya & Woodside, 2005) or, again, DCM (Marcussen, 2011; Landauer et al., 2014).

What all these models have in common, is the (implicit) epistemological claim that individual behaviour can be observed as objectively as nature (Babbie, 2008), often based on survey-generated quantitative data. By applying surveys, such approaches place the individual agent at the centre of their data collection and analysis. In doing so, they implicitly make the following two assumptions: (i) First, people have full information on the given alternatives; (ii) Second, they have complete awareness of the (thereby rationalized) reasons for their decisions and report on them correctly, although DCM include a stochastic (non-determined, less explicable) component of utility in their models. Despite these shortcomings, such models are a powerful tool to generate insights into the travel preferences and influences for larger parts of society, thereby contributing to advances both within academia, and destination planning and policy-making.

However, human decisions are known for their repeated deviation from the classical economic assumption of rationality (Sirakaya & Woodside, 2005), which can be described (among many other available interpretations throughout the various sub-branches of economic sciences) as the 'best-response strategy' given a certain set of values based on the assumption of completeness

(choice among all available alternatives) and transitivity (consistency of their choices) (Wilkinson & Klaes, 2012). One prominent example of a 'bounded rationality' (Rasouli & Timmermans, 2015) is the influence of peers, which is believed to be strong in the tourism context (Babbie, 2008; Bianchi et al., 2017). Peer pressure or subjective norms are not necessarily suitable for survey-based methods since people do not usually like to admit how susceptible they are, or are not aware of it (Cohen, Prayag, et al., 2014). Therefore, it is argued by some that such aspects are better covered using qualitative or mixed methods (Cohen, Prayag, et al., 2014).

One prominent attempt to quantitatively account for the persuasibility of people, especially in a more collective decision-context is the *Theory of Planned Behaviour (TPB)* developed by Ajzen (1991). The basic assumption of the TPB is that behaviour is determined by behavioural intention, which in turn is shaped by a person's attitudes towards a behaviour, subjective norms (social pressure) and perceived behaviour control (PBC), referring to the perceived capability to perform the behaviour (Ajzen, 1991; Cohen, Prayag, et al., 2014). While generally displaying positive utilities associated with the behaviour (Lam & Hsu, 2006; Bianchi et al., 2017), the element of PBC also covers the (perceived) constraints to the choice and therefore also follows the logic of indirect utility or costs to be avoided. Compared to DCM, the TPB and especially the PBC implicitly acknowledge the possibility of people facing real or perceived constraints that impede them from performing a desirable behaviour (Lanzini & Khan, 2017).

Despite these benefits, the TPB is not without limitations. It still assumes rationality or 'reason' within decision-making along the sequential steps of attitudes, intention and behaviour (Cohen, Prayag, et al., 2014). The assumption of people voluntarily 'planning' all possible behaviours does not appear realistic in a tourism context, where some choices may be planned while others are made impulsively (Cohen, Prayag, et al., 2014). At its core, the TPB mainly focuses on instrumental benefits (embedded in the construct of attitudes) and symbolic benefits (within subjective norms) but disregards the role of habits, emotions (e.g. fun or dear of driving) and personal (dis-)comfort (e.g. desire for privacy, risk-avoidance in trip planning) in making tourism decisions (Lanzini & Khan, 2017). To account for the specific characteristics of the tourism context, many studies have extended the TPB by factors such as past behaviour (Han et al., 2017), environmental values (Goh et al., 2017), destination familiarity (Bianchi et al., 2017), perceived risk and uncertainty (Quintal et al., 2010) or travel motives (Hsu & Huang, 2012). However, they typically neglect more structural, cultural or emotional factors.

Arising from the criticism of quantitative questionnaire-based methods outlined above, a large number of studies applies more critical, qualitative or mixed method approaches to understand tourism-related behaviours, especially when some of the influential factors are unknown for the chosen study context (Decrop & Snelders, 2005; Pansiri, 2006; Dickinson & Robbins, 2008). A field that has emerged at the intersection of transport and tourism is the study of tourism mobilities based on the mobility paradigm (see Hannam et al., 2014). While they don't aim at identifying 'choice determinants' in a positivist way, their often descriptive and analytical accounts of societal dynamics, internalized narratives and perceptions provide valuable insights. The study by Butler and Hannam (2014) for example investigates the rather new topic of automobility in the context of flashpacking (a more luxurious version of backpacking) by using unstructured interviews with 43 young and independent travellers in Norway. Their results highlight the desire

of 'being in control' in transport decision-making and emphasize the importance of intrinsic values involved in automobility (including fulfilment and fun of driving but also feelings of escapism, privacy and solitude among other factors). Another example is the study of Hibbert et al. (2013), who investigated the attitude-behaviour gap leading tourists to neglect their environmental values when travelling. By inquiring the travel life histories of participants, they find that social identity (as in personal differentiation and the image portrayed of oneself) may contradict and overrule environmental values. In a similar context, the

Despite the valid claim of travel practices being heterogeneous and therefore difficult to analyse using standardized quantitative surveys, these approaches come with their limitations as well. One key problem is that they do not permit any form of extrapolation to larger societal groups, transferability to other contexts or generation of representative estimates tied to longitudinal sociodemographic data for future destination developments (as was expected from the research project underlying this thesis). Thus, a purely qualitative approach seemed equally unsuitable to the given study context as a purely quantitative one, calling for a mixed approach.

A combined approach to tourism destination and mode choices

On a theoretical-conceptual level, many previous studies have postulated the interconnectedness of transport and tourism with transport acting as a facilitator, constraint, independent product or as one among many service elements shaping the overall tourist experience (Page et al., 2009; Le-Klähn, 2019; Hopkins, 2020). Hopkins (2020) argues that there are many ways in which '*transport is deeply and intrinsically connected to the tourist experience, and the tourism sector*'. has, so far, only sparsely entered the academic analysis. Despite these theoretical advances and the theoretical awareness of the interconnectedness of tourism and transport choices (Le-Klähn et al., 2015), there is a lack of integration in empirical methods and models (Page et al., 2009).

While many studies investigate transport choices in a tourism context (Guiver et al., 2013; Gutiérrez & Miravet, 2016; Gross & Grimm, 2018), only few studies have researched the connection between individual tourism and transport choices and those exceptions provided crucial guidance to this project (LaMondia et al., 2010; Masiero & Zoltan, 2013; Le-Klähn et al., 2015). The study by LaMondia et al. (2010), for example applies an MNL model to study the factors influencing the combined choice of visiting one among six tourism destinations by using one of three different transport modes. In doing so, they highlight the influence of distance, travel budget and destinations' accessibility on tourism-related mode and destination choices. By only using data from self-reported travel preference surveys, they could, however, not account for any destination- and alternative-specific transport or destination features. Le-Klähn et al. (2015) and Masiero and Zoltan (2013) on the other hand applied bivariate probit models to a binary destination choice (e.g. urban or peri-urban), therefore providing little insights into the disaggregate destination-specific determinants of different spatial decisions.

Table 2 below illustrates the different approaches taken by the various studies quantitatively modelling tourism-related mode choices, destination choices or both combined. With regard to RQ2, it illustrates that research on the relationship between mode and destination choices is still scarce and tends to include either mode-specific trip data or destination data, but usually not both.

Table 2: Overview of quantitative studies on tourism mode/ destination choices (adapted from Paper V)

Authors, year	Mode choice	Destination choice	Spatial context	Analytical techniques	Used data	Attribute groups
Only mode choice (arrival - arr, on-site - dst or both)						
Gross & Grimm, 2018	yes (both)	no	diverse (all of Germany)	Chi[2;] Kruskal-Wallis H-test	RA survey data (N=1,649 pers.)	1, 2
Gutiérrez & Miravet, 2016	yes (both)	no	small urban (Spain, coast)	multinomial logit model	survey data (N=4,336 pers.)	1, 2, (4)
Kelly et al., 2007	yes (arr)	no	urban to rural (Canada)	nested multi-nomial logit	survey data (N=876 pers.)	1, 2, 3, 6
Lumsdon et al., 2006	yes (arr)	no	rural (Great Britain)	regression models	survey data (N=1,261 pers.)	1, 2, 3, 5, 6
Thrane, 2015	yes (arr)	no	diverse (Norway)	multinomial logit model	survey data (N=2,139 pers.)	1, 2, 3, 6
Only destination choice						
Marcussen, 2011	no	100+ countries	diverse (all of Germany)	regression models	EU survey data (N=37,579 trips)	1, 2, 4, 6
Marrocu & Paci, 2012	no	107 provinces	diverse (all of Italy)	spatial inter-action model	aggregate tourism data*	1, 3, 4
Mutinda & Mayaka, 2012	no	33 nat. parks	diverse (Kenya)	factor analysis	survey data (N=118 pers.)	1, 2, 4, 6
van Middelkoop et al., 2003	no	8 Dutch regions, 11 international	diverse (NL, Europe, all)	rule-based model	NL survey data (N=7,121 trips)	1, 2
Delaplace et al., 2014	no	2 cities	urban (Paris, Rome)	regression models	survey data (N=378 pers.)	1, 2, 3
Paper III of this thesis	no	abstract dst definition	urban to rural (Austria)	SEM	Survey data (N=877 pers)	1, 2, 5, 6
Combined mode and destination choice						
LaMondia et al., 2010	yes (arr)	6 countries	national (EU countries)	multinomial logit model	EU survey data (N=2,298 trips), destination data	1, 2, 4, 6
Le-Klähn et al., 2015	yes (arr)	periurban yes/no	(peri-)urban (Munich)	bivariate probit model	survey data (N=474 pers.)	1, 2, 3, 4, 5, 6
Masiero & Zoltan, 2013	yes (dst)	one or more visited dst	mainly rural (Switzerland)	bivariate probit model	survey data (N=629 pers.)	1, 2, 6
Paper V of this thesis	yes (arr)	295 destinations	urban to rural (Austria)	multinomial logit model	survey data (N=695 trips), destination data	1, 2, 3, 4, 5, 6

Attribute groups: 1=person and household characteristics, 2=situational characteristics, 3=attributes of car and PT trips, 4=destination (dst) features, 5= attitudes, norms, perceptions, 6=travel motivations

3.4 Factors influencing tourism decisions and their relevance for behavioural change

Within the theories and models mentioned previously, a wide range of demand-side, supply-side and situational factors are used to explain the different choices made by travellers. No theory or model can integrate a fully comprehensive account of all possibly relevant factors, for neither destination nor mode choice. Thus, different theories and methodologies are needed to make contributions to the knowledge of influential factors of travel behaviour. As such, quantitative empirical studies usually focus more on objective and quantifiable influence factors (Le-Klähn et al., 2015; see Gross & Grimm, 2018 for an overview), although some subjective factors (e.g. attitudes, values, norms, travel and choice motives) are frequently integrated in model-based studies. Overall, they take a rather mechanical approach that integrates various factors as

independent, separable choice determinants. Qualitative approaches on the other hand seek for a more systemic, integrated understanding of behavioural motivations, therefore focussing on subjective influences, perceptions and meanings. These studies often present narrative accounts of their empirical material, investigating mobility as people's representation of values, their personal lifestyle and identities (Gronau, 2014; Hannam et al., 2014; Cohen et al., 2015).

To avoid redundancies with Paper V, this framework paper lists the relevant factors for an array of influence spheres (see Table 3) without discussing them in detail. The categorisation combines Gross and Grimm (2018) division into objective and subjective influence factors with Le-Klähn and Hall's (2015) illustration of different influence spheres; while adding additional elements.

Table 3: Overview of relevant influential spheres of tourism mobility choices (adapted from Paper VI)

Influence sphere	Examples of choice influences	Relevant literature
Objective influence factors		
(1) Personal / household characteristics	Socio-demographics (age, gender, income) Mobility tools (PT cards, car)	(Marrocu & Paci, 2012; Gross & Grimm, 2018) (Le-Klähn et al., 2015)
(2) Situational characteristics	Travel party, trip duration, spontaneity and complexity, destination familiarity, safety Weather at origin and overall climate and expected weather at destination	(Kelly et al., 2007; Le-Klähn et al., 2015; Gross & Grimm, 2018) (Scott et al., 2012; Pröbstl-Haider et al., 2015; McCreary et al., 2019)
(3) Attributes of car & PT trips	Accessibility by PT, travel time, distance, no. of changes, frequency, type of PT, travel costs Service quality and comfort	(Della Corte et al., 2010; Marrocu & Paci, 2012; Davies & Weston, 2015; Thrane, 2015; Ravazzoli et al., 2017) (Le-Klähn et al., 2014)
(4) Destination features	Tourism amenities: accommodation, shops, attractions, natural features/remoteness Transport infrastructure (e.g. PT, rental bike, parking), fare structure, information Costs of local transport and tourism services	(Boller et al., 2010; LaMondia et al., 2010; Gutiérrez et al., 2019; Tomej & Liburd, 2020) (Lumsdon et al., 2006; Dickinson & Robbins, 2008; Gronau, 2017) (LaMondia et al., 2010)
Subjective influence factors		
(5) attitudes, norms, perceptions	Attitudes towards destinations and transport modes, leisure-related associations with transport modes and related risks/uncertainty Personal values and identity, lifestyle	(Gronau & Kagermeier, 2007; Davies & Weston, 2015; Moons & De Pelsmacker, 2015; Karl, 2018; McCreary et al., 2019) (Hibbert et al., 2013; Gronau, 2014)
(6) Travel motivations & related experiential expectations	Motivations, such as novelty seeking, escape/relaxation, visiting family/friends and related activities (and equipment needs) Expectations such as privacy, intimacy, the unexpected, sense of control, freedom	(Crandall, 1980; LaMondia et al., 2010; Mutinda & Mayaka, 2012; Le-Klähn et al., 2015) (Boller et al., 2010; Hannam et al., 2014; Wilson & Hannam, 2017)

The factors' relevance for behavioural change in response to climate change influences

Before discussing the relevance of different factors for bringing about behavioural change, it seems necessary to first define *what kind* of behavioural change ought to be aspired in the field of tourism mobility behaviour in relation to climate change. With regard to general summer tourism behaviour, we can already observe behaviour change, mainly all fostered by people's desire to avoid certain discomforts created by the effects of climate change (e.g. heat waves, heavy weathers) (Moreno, 2010; Serquet & Rebetez, 2011). The behavioural responses to such events

include site substitution to avoid affected areas, activity substitution to be less exposed, temporal substitution towards a different month, strategic substitution of equipment or used gear to increase resilience, or 'informational coping' referring to the increased quest for climate-related information (Rutty & Scott, 2010; McCreary et al., 2019). In that respect, tourists hold a high intrinsic motivation and individual capacity to adapt their travel behaviour to the impacts of climate change (Rutty & Scott, 2010; Gössling et al., 2012).

Compared to abovementioned tourism choices, transport mode choices may be harder to influence. This is because the respective behavioural change is not necessarily the result of intrinsic motivation or a physical/psychological strain. More often, it is created by a feeling of responsibility or worry about the global impacts of climate change (Eriksson, 2008) or external policies restricting or pricing the demand for unsustainable transport modes (Gössling et al., 2012). The beneficiary of such behaviour change is society as a whole, while they may be perceived as a sacrifice by the individual (e.g. with regards to air travel, see Thaller et al., 2020). In fact, climate change might even adversely affect the choice of sustainable modes since increasing heat waves might reduce the willingness to walk and increase the desire for air-conditioned personal vehicles. Furthermore, the attempted behaviour change may be constrained by factors out of people's responsibility, such as PT accessibility or safe biking infrastructure. Tourists might also be constrained by travel-requiring commitments towards family, friends or employers (Gössling et al., 2012). Finally, the benefits are more indirect and long-term compared to destination changes that affect well-being directly and immediately.

Behavioural adaptation (as well as mitigation) processes of tourism choices can be driven by societal changes, including societal values (e.g. the concept of 'flight shame', see Gössling et al., 2020), changes of the political landscape and resulting changes in the available infrastructure and their attributes (e.g. price changes or new services). Personal factors (e.g. change of car ownership, changing interests) can also represent a starting point for transition processes, especially when targeting larger groups in similar situations (e.g. new housing projects). Unless PT constitutes the more convenient and overall attractive solution, such transitions require a personal problem awareness, as briefly touched upon before. However, results from international studies also show that emission-intense air travel has increased despite people's awareness of their climate change impacts (see Cocolas et al., 2020), suggesting that awareness alone does not suffice, especially in the non-habitual, pleasure-oriented tourism context (Ram et al., 2013; Hopkins, 2020). Cohen and Kantenmacher (2020) made a similar observation and concluded that it is crucial to frame the global benefits of less environmentally-harmful behaviour in different ways, focusing on the individual benefits of behavioural changes (e.g. on health, budget, experiences).

Behavioural change, especially in tourism, is not a linear or well-predictable process and as such previous literature highlights the role of psychological and lifestyle factors as pertinent constraints to people's change capacities (Cohen, Higham, et al., 2014; Gronau, 2014). Other studies also emphasize the role of socio-technical and infrastructural aspects of mobility cultures as a reinforcing mechanism for the rural car culture areas (Klinger et al., 2013; Haustein et al., 2020).

Chapter

4

OUTLINING THE
RESEARCH CONCEPT

Given that this dissertation is of cumulative nature, it consists of several papers that used different qualitative and quantitative methods of both data generation and analysis. This section aims at discussing the ontological and epistemological presumptions underlying the chosen methods since this pre-conceptualisation affects the type of influential factors initially taken into consideration. This is followed by an overview of the materials and methods applied within the separate papers.

4.1 The philosophical underpinnings of this thesis

Research in the social sciences, as in most other fields, is firmly rooted in the researcher's personal (or institutional) belief system and often adheres to a set of common theories, paradigms and resulting methods (Babbie, 2008). Kuhn and Hawkins (1962) define a research paradigm as '*the set of common beliefs and agreements shared between scientists about how problems should be understood and addressed*'. The different belief systems (e.g. positivist, constructivist, realist, critical or pragmatist) are usually characterized by their answer to three fundamental questions:

– (i) Ontology: What is reality? How is it conceptualized?
– (ii) Epistemology: How much and what can we know about it?
– (iii) Methodology: What procedures are suitable to acquire knowledge?

The thesis author works in the field of transport research, an environment with a rather strong focus on quantitative modelling approaches (Goetz et al., 2009). Typically embedded in positivist paradigms, such methods assume (i) an objective reality independent of the observation, which is based on (ii) law-like functioning of observation objects (e.g. tourists) that can be studied by an objective researcher, (iii) using experimental designs close to those of natural sciences (Pansiri, 2006). However, this view, especially the possibility for an objective science - is highly challenged by many researchers influenced by more critical or realist schools of thought and their paradigms (Babbie, 2008). One common argument is that such approaches fail to account for emotional, spontaneous, contradictory, diversely-biased or socially-shaped behaviours (Wattanacharoensil & La-ornual, 2019). While positivist approaches are also common in tourism research (e.g. consumer behaviour theories), current tourism research frequently addresses the bounded rationalities and inconsistencies of behaviour through more critical and subjectivist approaches (such as the mobilities paradigm, see Hannam et al., 2014). Given the positioning of this thesis between transport and tourism research, it set out to use of elements of both approaches.

While such paradigms usually affect the entire research process and method selection, this freedom was constrained by the objectives and guidelines of the larger project, which this dissertation is based on. Despite these constraints, the author's belief system did affect the fine design of used methods, the interpretation of results and the discussion of possible ways forward nevertheless. This raises doubts about the possibility of value-free or unbiased social science research (Hall, 2016), which is why the author's belief system is made explicit subsequently. Drawing from Raworth's (2018) understanding of sustainability and both post-positivist and pragmatist paradigms, the author perceives tourism realities as follows:

Ontology: Tourism mobility as a social practice exists independent from our capacity to observe it in full detail. Mobility choices as part of the tourism systems are shaped by mutually influential subsystems (stakeholders, laws, tourist flows, infrastructures), which are embedded in larger environmental processes (Babbie, 2008). Both people but also infrastructure and transport offers are constantly changing and adapting, increasing the complexity of the systems (Raworth, 2018). Therefore, we cannot comprehend these choices and influential factors in their full complexity and dynamics but can try to approach them through various methods targeting the decision-making factors of travellers as active agents in the tourism system at a given point in time.

This perspective of an embedded structure may be best represented by Leiper's (1979) 'framework of tourism', later enhanced by his model of 'tourist attraction systems' (Leiper, 1990). According to his models, travellers move between tourism generating regions, tourist destination regions and transit routes connecting the two. The so-called 'markers', which provide information on touristically interesting places and activities along the way or in destinations are shaped by societal values, changing preferences and trends. As an advocate of systems approaches, Leiper considers these subsystems (tourists, traveller generating regions, transit routes, destination regions and the tourist industry) to operate within and interact with '*broader environments: physical, cultural, social, economic, political, technological*' (Leiper, 1979) (see Figure 2 below).
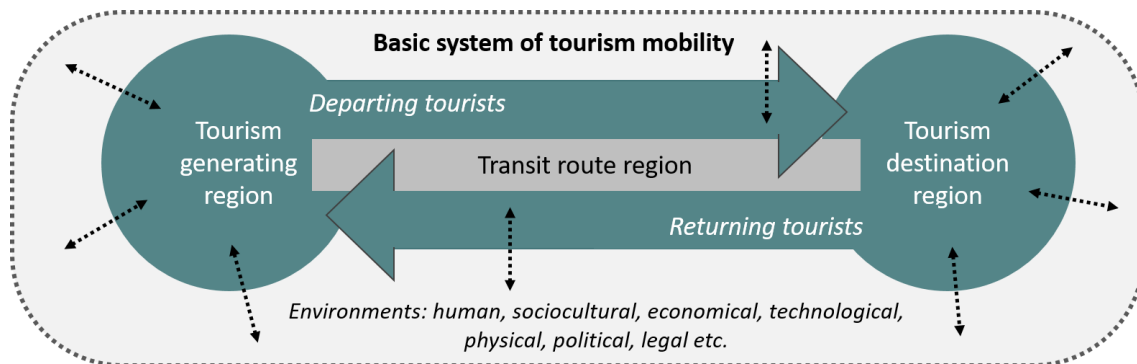

Figure 2: Basic tourism system, source: re-drawn after Leiper, 1979

Epistemology: Objectivity is an ideal that cannot be achieved fully since the separation between the researcher, and the research object is not possible. Especially within qualitative but even within quantitative methods, the researcher with her bias and pre-understanding shapes the knowledge creation process (in terms of questions asked, variables considered or throughout the interview process as such) (see Guba, 1990). To counteract some of these subjective influences, pre-tests were used to check for biases and some of the qualitative data were collected with the help of external, less involved researchers. Furthermore, the critical discussion with and feedback of the critical academic community, especially throughout the publication processes of all papers, has helped to reflect upon possible biases and has provided new perspectives on them.

Methodology: This thesis uses both quantitative and qualitative methods. As such, the inherent contrast between diverging underlying paradigms are part of the research and reflection process (Guba, 1990). What all methods have in common is their shared focus on the individual. According to previous studies (Gössling et al., 2012; Lanzini & Khan, 2017), consumers are a focal point of climate-related mitigation and adaptation processes, due to their strong and relatively fast adaptive capacity compared to other stakeholders in the tourism system. The negative environmental impacts of individual travel decisions substantiate the relevance of understanding individual consumer decisions. Therefore, this thesis focuses on their intrinsic and external motivators for making environmentally-friendly tourism mobility choices. There are several shortcomings related to this methodological individualism, respectively the focus on the individual as central analytical unit and source of reliable behavioural and motivational information. This includes the negligence of group dynamics and several biases affecting the reporting behaviour of individuals. Nevertheless, this approach still represents a suitable methodology for filling some of the research gaps on consumer choices in the study context.

4.2 Overview of the chosen case studies and the research framework

Austria and New Zealand were chosen as case studies for a number of reasons: From an economic point of view, tourism is a large source of income and employment in both countries, directly contributing 5.9% (Statistik Austria, 2020) and 5.8% (Stats NZ, 2019) to the GDP. By providing stable employment opportunities (both in the tourism sector and supplying industries), tourism in Austria is considered an important tool in supporting decentralized economic stability (WKÖ, 2019), thus withholding or slowing down trends of rural depopulation (BMLRT, 2020). This effect is further strengthened by the financial resource input of tourism developments for rural transport and leisure infrastructures, as well as projects supporting social cohesion and community development (Bricker, 2017). Because of their focus on decentralized, nature-based tourism (Bell, 2018), both Austria and New Zealand are climate-sensitive (Scott et al., 2012; Falk, 2014). At the same time, this accumulation of tourists in rural destinations is provoking a high level of car dependency, which is in clear opposition to aforesaid climate sensitivity.

Individual behaviour adaptation in response to climate change-induced changes to the tourism system is a comparably new research field with many unknown areas, as highlighted in the section on research gaps above. Therefore, purely deductive quantitative modelling approaches are less suitable due to the need of extensive ex-ante knowledge on influential factors. As a result, this thesis applies a mixed-method structure to derive its data, results and conclusions on all four research questions. First, qualitative focus group discussions were conducted to explore factors influencing tourism behaviour in Austria under the influence of climate change (see Paper I). The results ultimately informed the design of the quantitative Viennese survey. The results were then investigated using multiple qualitative and descriptive (see Paper II) as well as spatial (see Paper IV) and inferential statistical analysis methods (see Paper III and V). Ultimately, the topic of tourism mobility choices and the notions of automobility were studied in the context of New Zealand using Q-methodology to contrast findings (see Paper VI). The combined insights from all papers were fed into a model visualizing the author's understanding of the interconnectedness of urban-rural tourism mobility behaviour. Figure 3 lists the methods used, shows the data created within each step of this sequential research process and visualizes the connection between them.
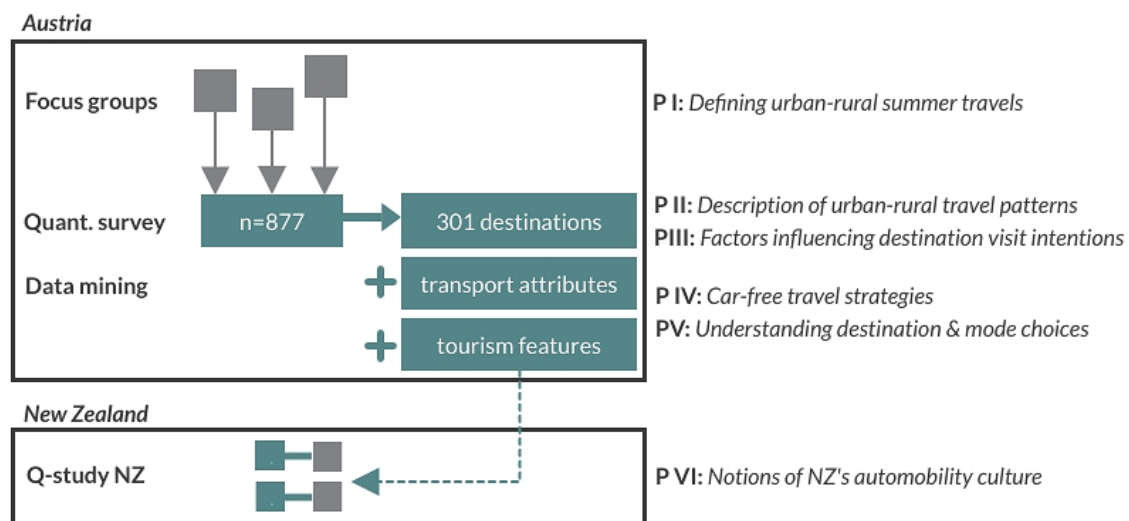

Figure 2: Available quantitative (green) and qualitative (grey) data used within the papers

4.3 Materials & methods

While the subsequent section will illustrate this step-wise process in some detail, the reader is invited to turn towards the papers for a full account of the data generation and analysis procedures.

Qualitative Pre-studies (for more detail, see Paper I)

As a first step, *two semi-guided focus groups* were conducted. They were used as a rather exploratory means of testing existing and generating new hypotheses with respect to RQ1. Compared to classical interviews, these discussions allowed for an integration of broader perspectives within a limited survey preparation time. Furthermore, the thought-provoking group dynamics arising from interactive discussion settings can provide relevant additional insights, which is desirable considering the exploratory nature of the topic at hand (see Kühn & Koschel, 2011). The discussions thematised attitudes towards 'Sommerfrische' destinations and the factors influencing tourism decisions in response to climate change and heatwaves.

A *qualitative content analysis based on Mayring (2000)* was performed using the verbatim transcripts of both focus groups. This method seemed suitable since the analytical goal was to explore possibly relevant additional influence factors by reducing the multiplicity of the material to a number of manageable categories. It was not, as done within grounded theory or critical realist approaches, to build a comprehensive theory grounded in the data or conduct an in depth-analysis of mechanisms underlying behavioural choices (Kühlmeyer et al., 2020). To scrutinize the researcher's own subjectivity, the coding scheme, which was developed in an iterative open coding process, was critically discussed with project partners who observed the focus groups (Kühn & Koschel, 2011). The results were ultimately used for a review of the perception of rural 'Sommerfrische' travels (see Paper I) and the survey development.

Quantitative survey development

The core dataset, which is the basis for most of the papers included in this dissertation, is derived from a *quantitative online-survey* among 877 Viennese citizens. The survey covered a range of themes, including (i) general travel patterns, preferences and motives (ii) previous trips to rural summer destinations in Austria, (iii) attitudes towards these destinations (based on an extended TPB model), (iv) perceptions of heat and personal adaptation measures, (v) desired tourism and transport offers in such rural Austrian destinations, (vi) sociodemographics, and (vii) available and typically used mobility tools. The recruitment of participants was carried out by an online panel provider, which allowed to create a representative sample for the Viennese population by age and gender. The sample description of participants can be found in Papers II and III. After cleaning and preparing the dataset, a descriptive analysis of the final data was conducted.

The survey data were used for the analysis of sociodemographic, attitudinal, and motivational factors influencing tourism choices (see Papers II & III). To also analyse the influence of supply-side factors, different data mining strategies were exploited in order to collect and annotate information on each destination visited by one or more participants (see categories 4 and 5 in Table 4). The complete dataset including trip and destination features was the basis for the analysis of spatial travel patterns as well as the tourism destination and transport mode choices (see Papers IV & V). Table 4 below (a modified version of Table 2 from Paper V) illustrates the

final dataset consisting of the survey data (covering categories 1, 2 and 3) and the annotated trip and destination data (covering categories 4 and 5).

Table 4: Data generated through survey (groups 1- 3) and data mining (groups 4-5)

Determinant dimensions and variables	Source
1 - Person and household characteristics gender, age, education, income, location, heat exposure, travel patterns mobility tools: cars, bikes, PT reduction cards	Viennese survey
2 - Travel motivations e.g. relaxing, sports, time with family, escape the city	Viennese survey
3 - Situational characteristics e.g. trip duration, travel party, chosen accommodation	Viennese survey
4 - Attributes of car and PT trips travel time, changes, service intervals, PT category etc.	VAO
5 - Destination features in-destination mobility offers and regional connectivity by bus/train tourism facilities in 60-minute walking distance	'Scotty' (ÖBB) search, OSM queries, manual search

Analysis of factors influencing urban-rural destination choice (see Papers II and III)

The first analytical step involved the *analysis of descriptive data and a segmentation analysis* (see Paper II), which seemed suitable given the increasingly heterogeneous preferences and travel patterns of travellers visiting nature-based destinations (Derek et al., 2019; Smith et al., 2019). For the segmentation of travellers, a-priori (theory-driven or common-sense) or a-posteriori (data-driven, explorative) approaches exist (Dolnicar, 2008). In this study, both methods were tried, but as suggested by previous research (see Finsterwalder & Laesser, 2013), sociodemographic variables seem to have less explanatory value when explaining travel behaviour. In consequence, travel motives were used for the segmentation analysis. The Principal Component Analysis of all motive-related variables produced three core motive groups, which were each described with regard to socio-demographic, behavioural and attitudinal variables.

The second analytical step includes a *destination choice model based on the Theory of Planned Behaviour* (see Paper III). Due to the importance previous research has attributed to the social influences of peers and media on tourism decisions, the coverage of these themes seemed important, especially when studying tourism choices under the influence of climate change (Sirakaya & Woodside, 2005; Karl, 2018). Since conventional discrete choice models (such as Pröbstl-Haider & Haider, 2013) often disregard innate personality features and their persuasibility by social groups, the TPB was considered a suitable theoretical framework. As a result, an extended TPB model was developed that accounts for factors relevant to the study context (see Conner & Armitage, 1998 for an account of extensions used in previous TPB models). For this study, social norms, the media image of rural Austrian destinations, past behaviour and perceived heat stress were included as additional constructs. Two latent dependent variables were defined: the behavioural intention to visit such destination (i) in general and (ii) in case of increasing urban heat waves. Confirmatory factor analysis was applied to all 48 TPB-related items before developing the Structural Equation Model (SEM) in an iterative process to analyse the strength and direction of the causal relationships between the constructs. Different fit indices were used to evaluate the change in model fit and explained variance of the behavioural intention produced by the additional construct (see Hu & Bentler, 1995; Lam & Hsu, 2006).

Analysis of mobility patterns and combined mode and destination choice (see Papers VI-V)

In tourism and transport literature, actual and perceived/cognitive accessibility are mentioned as key constraints to travels by PT (Prideaux, 2009; Schirpke et al., 2018; Le-Klähn, 2019). These constraints can hardly be studied using psychological models such as the TPB with their focus on personality rather than destination features (see Sparks & Pan, 2009). Instead, existing studies focussing on accessibility often use GIS-based approaches to investigate the PT network connectivity of specific tourist regions (Tomej & Liburd, 2020). Since this thesis does not focus on single destinations but on factors influencing modes choices for tourism trips, a trip-based approach was applied.

Using both the survey and annotated data, an *exploratory spatial analysis* was performed (see Paper IV) to explore the spatial distribution of travel patterns. The first step included a comparison of car-free and car-owning households with respect to the desire and perceived ability to visit rural Austrian destinations, showing a similar travel interest but different perceived travel abilities. Car-free households feel more constrained in their travels, resulting in a need to adjust either their travel modalities, used transport modes (e.g. PT, carsharing) or visited destinations. To analyse spatial travel patterns of PT travellers and the characteristics of those destinations visited without a car, destinations were first clustered by their respective share of car-free arrivals based on the Viennese survey data. For this purpose, a two-step cluster analysis was performed, identifying three distinct groups, which were then used for a k-means cluster analysis (Dolnicar, 2008). The three groups included destinations predominantly visited (i) by PT (n=25), (ii) by car (n=175), and (iii) by both transport modes alike (n=112). Based on the cluster variable, all three groups were characterized regarding available tourism and transport infrastructures (mean-value comparison) and their spatial distribution and clustering throughout Austria (hotspot analysis).

Following this visualisation of spatial patterns of mode and destination choices, an inferential analysis was performed to investigate their causal relationships. Therefore, a *multinomial logit model (MNL)* was developed to analyse the causal relationships between mode and destination choices and the variables influencing both. In many cases, mode choices are modelled using DCM (working with disaggregate stated preference data) whereas destination choices are often modelled using spatial interaction models (working with aggregate, revealed preference data) (see Guo et al., 2012; Landauer et al., 2014). There are doubts about the alignment of stated behaviour with actual behaviour, which is why revealed data were preferred over stated data in this study. The MNL allows to jointly model destination and mode choices using revealed preference data at the disaggregate level of individual trips, which is a particular strength of this approach. Given the large number of alternatives (295 destinations times two mode choices) and the large number of candidate model predictors (341 variables from all five dimensions of Table 3), an ex-ante screening of candidate variables was done using semi-partial correlations. The high correlation between their t-values with those of the final model predictors suggest this to be a suitable selection method. Assuming a dependency between different choice alternatives, a nested structure was tried, but it did not improve the model fit.

Q-methodology (see Paper VI)

In the last step, a *Q-methodology study* was undertaken to study automobility in the context of urban-rural tourism trips in New Zealand (see Paper VI). The purpose of this study was to provide a more holistic perspective on the narratives evolving around leisure or tourism-related mobility practices, complementing and contrasting the insights generated throughout the previous papers on the Austrian context. To take these previous insights consideration while also exploring unknown perceptions of transport options for tourism trips, as well as reflections upon personal choice motivators in an open yet structured manner, Q-methodology seems suitable (Stergiou & Airey, 2011). As an inherently mixed method, it asks a diverse set of participants to rank statements by their level of agreement (Watts & Stenner, 2012). The more quantitative sorting process is then complemented by a qualitative post-sorting interview that aims to delve into the reasoning behind the sorting choices and depict possible inconsistencies and hidden choice motivators.

Drawing from insights of classical mode choice models, studies on tourism mobilities and mobility cultures, a set of 47 statements on mode choice influences were compiled. They covered normative statements on (i) transport and tourism infrastructure and supply, (ii) travel behaviour, (iii) transport policy, (iv) public discourses, (v) instrumental car use motives, (vi) symbolic-affective car use motives, (vii) additional trip aspects, and (viii) motivations for leisure trips. To diversify the group of participants as emphasized by Q-researchers (Watts & Stenner, 2012), selection criteria were defined and different communication channels used to find the total of 25 interview partners. Once entered, the quantitative Q data were analysed by means of a by-person factor analysis that is at the core of Q-methodology (Watts & Stenner, 2012). After completing the quantitative analysis, the results were contrasted with and complemented by the qualitative information gained through the post-sorting interviews and analysed by means of a content analysis. This helped reducing the risk of inadvertently overlooking any pertinent choice factors.

4.4   Research ethics

The focus groups were conducted with Viennese citizens and tourism/transport experts. All participants actively gave their consent to participate in the group discussions and agreed to the verbal and written collection of data (by use of microphones and separate notes) and the scientific use thereof. No personal information allowing to trace back a participant's identity were stored. The survey data were collected with the help of an Online-Access-Panel provider. In consequence, all participants who were recruited from the participant pool (all above the age of 14) actively agreed to be part of the pool when signing up with the panel provider and agreeing to their terms. Furthermore, they gave their consent to the scientific use of their data by choosing to participate in the survey. Before starting the online survey, they were informed that all generated data would be treated anonymously and confidentially with no third-party access to any of these data. Since the email-address is only known to the panel provider, the researchers do not have any information that would allow them to trace the individual behind the survey entries. In compliance with the respective EU Directive, the dataset itself is stored on a University server, the respective folder only being accessible to the researchers involved in the research project. The Q-methodology study complied with all research ethics standards in New Zealand and was approved by the Human Ethics Committee of Lincoln University (application number 2019-88).

Chapter

5

SUMMARIZING THE
PAPER CONTRIBUTIONS

Against the background of climate change impacts on tourism, this dissertation is concerned with the factors influencing tourism-related decision-making and their relevance in the context of behavioural change. To study this from a range of perspectives, the projects contained in this thesis are rooted in different theoretical and methodological frameworks. As such, they also contribute to a broader discussion on the benefits and shortcoming of such approaches. The following section outlines the highlights of all six papers and discusses their relevance to the overall research objectives.

5.1   Overview of papers and research questions

Due to the cumulative structure of this dissertation, the findings result from the combination of the six (submitted or published) articles or chapters. As previously indicated, the different papers address varying but partly overlapping aspects of the four research questions. Table 5 below provides an overview of the positioning of each paper with regard to the research questions. The following sections present all six papers by first outlining each paper's positioning and purpose within the research process, then listing its key highlights and finally discussing its contributions towards one or several of the research questions. The information regarding the contributions of the thesis author to each paper is included in the paper overview pages in Part II of this dissertation (starting on page 67).

Table 5: Contribution of the six papers to the four research questions

Paper number / rough content		RQ1	RQ2	RQ3	RQ4
Paper I	Defining urban-rural summer travels in Austria	●	○	◐	◐
Paper II	Description of urban-rural travel patterns	◐	○	◐	◐
Paper III	Factors influencing destination visit intensions	●	○	●	●
Paper IV	Car-free travel strategies	○	◐	●	◐
Paper V	Understanding destination and mode choices	●	●	○	●
Paper VI	Notions of tourism (auto-)mobility cultures in NZ	●	◐	●	●

Legend

○	No or very indirect coverage of RQ	◐	Partial but direct coverage of RQ	●	Extensive coverage and discussion of RQ

RQ1: Which factors influence mode and destination choices for urban-rural tourism trips?

RQ2: How can the relationship between destination and transport mode choices be described?

RQ3: Which internal or external factors encourage or constrain changes in tourism behaviour in response to climate change effects or debates?

RQ4: How can different theories and methodological approaches be integrated to enhance the understanding of urban-rural tourism mobility choices?

5.2   Paper I: Describing 'Sommerfrische' travels in Austria

Within this dissertation, Paper I provides an overall contextualisation of and an introduction to the so-called 'Sommerfrische' destinations, which represent the type of destination studied in this dissertation. Besides a review of historical and current literature on the tourism phenomenon and its potential revival in the context of intensifying climate change-induced urban heat waves, this chapter contains the results of the qualitative focus groups. They were conducted to generate new hypotheses for the design and analysis of the quantitative Viennese survey, mainly with regard to (i) the relationship between heat and travel intention as a form of climate change adaptation as well as (ii) the implications of individual travel patterns on transport needs and preferences.

Paper highlights

– Explores perceptions and potentials of rural 'Sommerfrische' as an escape from urban heat
– Uses focus group discussions to investigate current discourses, challenges and potentials
– Identifies the positive notions and diverging travel patterns associated with the term today
– Emphasizes the challenges related to the spontaneity of heat escape trips for all stakeholders
– Discusses the relevance of such travel patterns for mobility and sustainability aspects

Summary of results and relevance to research questions

The revival of the term 'Sommerfrische' in the past years has partly been attributed to the burden of intensifying urban heat waves. Focus group discussants showed substantial interest in such rural, nature-based destinations, especially in the context of sleepless 'tropical nights' (temperature not falling below 20°C at night) in Vienna during heat waves. Compared to its historical meaning of relaxation-oriented, re-occurring long-term vacations for the entire family (Schmidt-Lauber, 2014), the term is now associated with more spontaneous, short-term vacations, involving multiple travel motives and locations simultaneously (see also Weigel, 2014 for a discussion on the change of the term).

According to the discussions, the spontaneity of such travel decisions affects both destination and transport mode choices. While not necessarily returning to the same places every time, people prefer to visit destinations with good word-of-mouth feedback or familiar contacts to minimize the need for trip planning and information searches. As such, participants criticized the current insufficiency of available online information and booking options of many destinations, making it harder to plan spontaneous trips to such places. Accordingly, they stated that such information would have an influence on their destination choices. Regarding mode choices, both the spontaneity and the desire for rural, secluded areas strengthen the role of the car, both because of limited accessibility of other modes for travellers and again, because of the desire to minimize risks, uncertainties and planning needs. Once at the destination, nature-based activities prevail.

Overall, the findings show the potential of such urban-rural trips as a possible climate change adaptation strategy of urban tourists seeking comfortable temperatures and fresh air in their destinations. While discussants have reported spontaneous adaptations of their travels in response to climate change, it is unclear to which extent heat is an effective motivator of such trips or rather a subconscious mechanism influencing choices.

5.3 Paper II: Description of urban-rural travel patterns and segments

Drawing on the focus group results, Paper II describes the design and generated sample of the Viennese survey data. It contains a descriptive analysis of domestic travel preferences of participants followed by a segmentation analysis to account for the heterogeneity of preferences. The descriptive results of the survey data provide first insights into the factors motivating urban-rural trips towards nature-based tourism destinations and related transport mode choices.

Highlights of the paper

– Describes the rural travel preferences and trip characteristics of Viennese travellers
– Focuses on the role of heat stress as a potential push driver of increasing urban-rural tourism
– Uses descriptive and factor analysis tools as well as focus groups to generate findings

– Identifies three groups of travellers with distinct travel motives and characterizes them
– Derives recommendations for sustainable tourism and mobility pathways in rural destinations

Summary of results and relevance to research questions

The results show that heat can be an explicit driver of urban-rural tourism movements in Austria. However, it tends to be one among many motives, whereas relaxation, physical activities or enjoyment of nature in general (e.g. mountains, forests) represent the more dominant travel motives. In line with the results of McCreary (McCreary et al., 2019), respondents indicated different travel adaptation strategies in response to climate change, including a change of activities, travel time frames and destinations. More specifically, the results suggest that heat stress could result in different adaptation behaviours (including previous trips out of the city staying at home). The causality between the two was further analysed by means of a TPB model in Paper III.

With regard to transport mode choices, the results of the paper suggest that the dominance of the car for these urban-rural visits is largely created by the lacking accessibility of other transport alternatives but also by habit and related attitudes of households already owning a car. Especially for car-free households, rural areas seem harder to reach (despite being perceived as attractive destinations). Accordingly, they classified those policy or planning measures as desirable that would increase the (physical and cognitive) accessibility of destinations and travel flexibility as well as improved PT service quality with a preference for direct train connections, more affordable PT prices, facilitated luggage transport and guest passes offering free PT (Gronau, 2017).

5.4 Paper III: Factors influencing 'Sommerfrische' visit intensions based on the TPB

Deepening the discussions raised throughout Paper II, Paper III investigates the intentions of the Viennese population to visit rural summer destinations in Austria in general and under the condition of increasing urban heat occurrences. To do so, the paper presents SEM results on the factors motivating the behavioural intention to visit urban-rural tourism destinations in Austria and on the behaviour change resulting from heat as a hypothetical external stimulus.

Paper highlights
– Explores the impact of heat as an external stimulus within a TPB model
– Extends the TPB model by including travel motives, media, heat stress, past behaviour & peers
– Identifies subjective norms, media influence & travel motives as key factors shaping intention
– Shows the positive influence of increasing heat on visiting intention, controlled by heat stress
– Discusses how destination familiarity and perceived visit abilities might affect mode choices

Summary of results and relevance to research questions

Acknowledging that tourist decisions are often shaped by social dynamics and interpersonal relations (Bronner & de Hoog, 2008), the design of the quantitative Viennese survey was based on an extended TPB model. The results show that the intention to visit rural Austrian tourism destinations is mainly influenced by a combined construct of social and subjective norms, followed by the travel motive 'outdoor sports' and the positive media representation of these destinations. The perceived personal capability to get there (as illustrated by the PBC) and

destination familiarity (measured through previous visits) represent less strong but still significant influences on the intention to visit these destinations. Individual attitudes, on the other hand, have no significant influence which may be caused by the behaviour being a collective, socially influenced decision, where personal opinions may be less influential.

To gain insight on potential drivers of behavioural change, an extended TPB model was developed and tested, which includes the intended adaptation to heat as an external stimulus or hypothetical intervention. The results indicate that the intention of participants to visit rural Austrian destinations increases under the assumption of intensifying urban heat. The main influential factors are the general visiting intention as well as the perceived stress caused by heatwaves. It is important to note, however, that the extended model could only explain 31% of the variance in heat-related intentions (compared to 54% of the variance in general visiting intentions). This raises doubts about the suitability of the TPB (as a theory assuming rational, planned and informed choices) to capture such hypothetical, emotion-based and possibly unconscious influences on behaviour as is the case with 'heat stress'. Furthermore, the PBC has an influence on heat-related intentions, suggesting that not everyone feels capable of adapting their behaviour despite being stressed by intense heat waves.

Despite being considered a destination choice model, parts of the TPB model still contain insights with relevance to future transport mode choice models. This mainly applies to the role of past behaviour and the PBC as possible factors at the intersection of tourism and transport choices. As such, the PBC was found to constrain survey participants in their intention to visit Austrian rural summer destination. This perception can, among other factors, be shaped by the available transport and tourism infrastructure, and the ease of using (or trying to use) them in the past. Past behaviour, on the other hand, has a positive influence on visit intentions. Transferred to transport, this suggests that destination familiarity, in line with risk avoidance, may be important influences in favour of PT use. This may be supported by previous studies highlighting the relevance of PT modes when indicating friends and family visits as trip purpose (see Gross & Grimm, 2018).

5.5 Paper IV: Car-free travel strategies and their spatial clustering

Within this dissertation, Paper IV integrates mode choice and destination features in the spatial representation of destination choices. It does so by focussing on car-free households and car-free travellers and compares their travel patterns and destination choices to those of people owning a car or using one for their domestic tourism trips. In doing so, it presents a qualitative exploration of the spatial relationship between tourism and transport choices, which will serve as a discussion basis for the MNL model investigating the specific factors explaining both choices.

Paper highlights
– Shows that car-free households feel more constrained to visit rural destinations
– Suggests that their adaptive behaviour to these constraints involves several strategies
– Emphasizes the importance of differentiating between car-free households and travellers
– Analyses whether car-free travellers make significantly different destination choices
– Describes destination features of places visited primarily by car or by car and PT alike

Summary of results and relevance to research questions

Past behaviour and the PBC were assumed to affect both destination and transport mode choices. This is the case because the perceived capability to travel somewhere, or the personal experience of doing so, do not only depend on the attractiveness of destinations but also relate to available transport infrastructure and the perception of their service quality. The findings of Paper IV support this assumption by illustrating that car-free households reported fewer trips to rural destinations in the past and, using the TPB model of Paper III, also feel less able (or, adversely phrased, more constrained) to visit them. This suggests that the available tourism and transport infrastructure of the visited destinations represent a constraint to car-free travelling (Tomej & Liburd, 2020). However, the constraints of not owning a car can be mitigated (at least partly) by a range of adaptive travel strategies, which were adapted to the tourism context based on the literature on car-free urban living strategies (Hesselgren & Hasselqvist, 2016; Lagrell et al., 2018).

Using the Viennese survey data, the results show that gaining access to a car through renting or borrowing is a widely used strategy, which is why the distinction between car-free households and car-free travellers is important. The two groups do not necessarily overlap. Clearly, the use of public transport is a frequently adopted behaviour, where possible. Regarding the change of other trip characteristics, results are less clear. While there is some indication that car-free travellers stay in destinations longer (but also perform more day trips), the assumption of longer planning horizons or a preference for pre-organized tours could not be supported.

Assuming that car-free travellers and car-bound travellers rely on different transport and destination attributes, cluster and hot spot analyses of destinations by their visitors' arrival and in-destination mode choices was performed. The results of the cluster analysis resulted in two significantly distinct groups: destinations that are (i) primarily visited by car or (ii) by car and PT alike. While there is no clear spatial pattern, the two groups display significant hotspots in different parts of Austria. The first group has several hotspots in different rural areas, characterized by a lower PT accessibility level. The second group clusters in destinations near Vienna or the 'Salzburger Land' region, all defined by their high touristic attractiveness and PT accessibility. These findings suggest that destination features such as tourism infrastructure in walking distance, PT service quality, carsharing offers etc. may influence both mode and destination choice, providing ground for the assumption that both choices are interlinked.

5.6 Paper V: Combined destination and transport mode choice model

Related to the assumption on the interconnectedness of transport and destination choices postulated above, Paper IV provides empirical evidence for a more detailed discussion on their relationship. To do so, it draws from the many insights on possibly relevant decision-making factors identified throughout Papers I to IV and combines them in a joint destination and mode choice MNL model of urban-rural tourism trips. The resulting findings serve as a basis for the conceptual model of urban-rural tourism mobility presented in this dissertation. Drawing on previous studies on the various factors influencing these choices (LaMondia et al., 2010; Le-Klähn & Hall, 2015; Gross & Grimm, 2018), a joint MNL model was developed that explored a wide range of possible demand and supply-side factors.

Paper highlights

– Suggests that tourism destination and transport mode choices are mutually influential
– Applies an MNL model to analyse the impact of both destination and transport attributes
– Finds that car-bound and PT travellers respond differently to the time and distance of travel
– Highlights that destination branding and the walkability of local facilities matters to PT users
– Concludes that tourist and daily mobility are connected through underlying mobility cultures

Summary of results and relevance to research questions

The model displayed cross-influential effects, suggesting that destination and mode choices are indeed intertwined types of tourism decisions. As such, mode choices were influenced by the density of tourism infrastructure (shops etc.) in walkable distances (besides other, more transport-related factors), while destination choice was also affected by mobility offers within the destinations (bike rental etc.). Despite the variety of transport and tourism features included in the model, the strongest destination attractor was a high-quality web-presence, including up-to-date information on accessibility and attractions. Further influential mode choice factors are people's mobility tools (car ownership or PT tickets) and situational aspects (e.g. travel company and accommodation).

Another important finding was the difference between car and PT travellers with respect to their sensitivity to travel distance and travel time. The results showed that compared to car travellers, PT travellers are less sensitive to travel distance. This can be attributed to the finding that travel speeds of PT increase disproportionately to the speeds of car travels with increasing distance, most likely caused by the availability of high-speed trains for long distances. Furthermore, PT travellers are shown to be almost insensitive to the travel speed, presumably because of the possibility to use their time for useful or pleasurable secondary activities (such as reading or watching the scenery, see Lumsdon et al., 2006). However, this only applies under the condition that they can travel by train, without the need to use less well-perceived buses. Car travellers are much more sensitive to speeds since slow speeds are usually related to small, windy, or congested roads.

Furthermore, the results emphasize the importance of mobility tools (ownership of car or PT reduction ticket) in shaping people's mode choices for tourism purposes. This raises the assumption that every-day and tourist mobility are co-dependent and both influenced by the respective mobility cultures (as in the 'specific socio-cultural settings consisting of travel patterns, the built environment, and mobility-related discourses', see Haustein & Nielsen, 2016) at the travellers usual environment. Therefore, the modelling results cannot easily be transferred to other tourism contexts given the differences in available infrastructure and cultural pre-dispositions towards certain modes of travelling, an aspect that needs further consideration.

5.7 Paper VI: Notions of automobility cultures among domestic travellers in NZ

Drawing on the assumption that dominant mobility cultures and paradigms affect both every-day and tourism mobility choices, an exploratory Q-methodology study was conducted and presented in Paper IV. It was performed during a research exchange in New Zealand and focused on the notions evolving around urban-rural tourism mobility choices around Christchurch. Given the

vastly diverging PT infrastructure, cultural mind sets and resulting travel practices, this study cannot be used in direct addition to the findings from Austria. Much rather, it serves as a starting point for further discussions on the embeddedness of tourism mobility choices in a wider socio-technical and infrastructural environment. In doing so, the findings support the theory-building process based on the findings from Paper V (and integrating findings from all previous papers).

Paper highlights

– Explores the narratives of the tourism-related transport mode choices of urban residents in NZ
– Conducts a mixed-method Q-methodology study drawing from various theoretical concepts
– Depicts influential factors at the (inter-)personal, societal/political, and infrastructural level
– Stresses the relevance of the juxtaposition of qualitative and quantitative research approaches
– Presents a conceptualisation of the relationships between mode choice dimensions

Summary of results and relevance to research questions

Despite their different geographical and cultural contexts, Austria and New Zealand share certain features that allow drawing general conclusions for this thesis. Other than the quantitative model in Paper V, this study focuses on the practices and narratives related to the structural car dependency of tourism trips. Given the subjectivity of this focus, Q-methodology as an inherently mixed method was applied, and the statements drew on insights from studies based on the mobilities paradigm, mobility cultures and classical mode choice research to gain a more holistic perspective.

With regard to the factors influencing tourism-related mobility choices, the results indicate that there are different groups of people for whom different narratives dominate their mode choices. The quantitative analysis of the Q sorting reveals four different notions: (i) convenience-driven motorists, (ii) PT-affectionate multi-modals, (iii) Electric vehicle (EV-) & PT-positive car-dependents, and (iv) car-addicts for stress avoidance. The qualitative post-sorting interviews revealed additional, partly contradictory results that are relevant to the contextualization of the study. In this context, the role of (i) personal lifestyle choices and interpersonal influences, (ii) cultural values and place attachment, (iii) social stigma and public perceptions of PT as well as (iv) infrastructure and policy changes were discussed. The contradictions between both research parts mostly evolved around the views on social stigma or societal perceptions of transport modes. While the respective statements were often disregarded in the quantitative part, the very same narratives were brought forward as pertinent factors throughout the qualitative interviews. This raises a discussion on the suitability of standard quantitative surveys or the requirement of careful phrasing when investigating lifestyle- and habit-related or subconscious choice influences. At the same time, it highlights the added value of comparative mixed-methods approaches to avoid socially-desirable answers and receive more stable, reflected views.

Based on these quantitative and qualitative findings, this paper suggests a conceptualisation of influential factors of tourism mobility choices which accounts for the embeddedness and interconnectedness of the dynamics of social interactions. This conceptualisation will complement the theoretical insights generated throughout Paper V, and in doing so, a joint conceptual model on the factors influencing rural-urban tourism mobility behaviour will be proposed in the discussion section of this dissertation.

Chapter

6

DISCUSSING FINDINGS
AND IMPLICATIONS

This section presents an overarching conceptual framework for the factors influencing urban-rural tourism mobility choices. Subsequently, it summarizes the joint contributions of the six papers to all four research questions. This is followed by a reflection on the contributions of the different methodological frameworks as well as the planning and policy implications resulting from the thesis findings.

6.1 Conceptual model of urban-rural tourism mobility choices

Many models that illustrate influential decision factors on tourism (mobility) choices visualize them as independent 'boxes' including for example 'psychological' or 'infrastructural' factors (Chatterton & Wilson, 2014; Le-Klähn, 2014). This thesis assumes an embedded, hierarchical structure between these elements of tourism systems. This follows line of argumentation (Hall & Page, 2014), who states that '*the dynamics of tourism can only be fully understood with reference to its wider societal contexts'.* Consequently, individual choices must be observed with consideration of their broader societal framing. Leiper's framework covers the societal environment, but is criticized for disregarding the complexity of tourism trips with regard to first and last mile, multi-destination trips or tourist activities along the transit routes (Lamont, 2008). Despite these limitations, it serves as a good starting point for a systemic visualisation of factors influencing urban-rural tourism mobility decisions (see Figure 4). The suggested model for urban-rural tourism mobility choices primarily builds on Leiper's model of tourism systems (1979, 1990), while integrating other theoretical contributions (Chatterton & Wilson, 2014; Le-Klähn, 2014) and the findings of all six papers.

The *upper part* represents a visualization of the author's understanding of tourism mobility in line with the ontological beliefs outlined previously. It describes tourism mobility as movement of travellers (and the situational context created by their preferences and general tourism choices) across and within the three elements of the tourism system (origins, destinations, transit routes). In response to the criticism of Leiper's model (Lamont, 2008) and the understanding of this thesis, this visualisation integrates the following aspects compared to the original model:

– The *different environments* listed by Leiper are brought into a hierarchical order. Starting from the outside, we can see the natural environment as exogenous influence, with climate change being an important stimulus affecting the ecological, natural, socio-political and infrastructural environment, and as such, both tourism-generating and tourism destination regions. The next sphere, socio-political environments are believed to create norms, infrastructural and service realities (hence the tourism portfolio and communication thereof) (see Hall & Page, 2014), since no road would exist without sufficient social, political and financial support for it. Ultimately, the interplay between these environments affects people's tourism preferences.
– *Individual travellers* are not independent decision-makers but most often co-dependent travel groups affected by co-created needs and norms caused by their interpersonal relations, the restrictions resulting from their situational context and the environments surrounding them.
– Given the study context, the *dichotomy between both the 'urban' and the 'rural'* in terms of socio-political discourses and infrastructural settings are highlighted (using gradient colours).
– Tourism mobility starts within, not at the edge of tourism-generating regions and moves freely across destination areas where further (multi-)day trips can be performed.
– Through different channels, *communication* on unique or noteworthy destination elements (and ways of getting there) must be transmitted towards potential travellers in urban areas (not just within the destination) to facilitate PT trip planning processes.

The *lower part* lists all factors that have shown to influence urban-rural tourism mobility decisions (including both destination as well as transport mode choices as integral elements of mobility choices) within the incomplete, yet still extensive analyses presented in this thesis.

A system model of tourism mobility for urban-rural tourism trips

Climate change   **Natural environment**   **Climate change**

Socio-political environment

Service / infrastructural environment

URBAN ORIGIN   **RURAL DESTINATION**

Travel

Trave-ler(s)   *Expectations*   **On-site mobility**

Arrival & departure routes

situation   *Experiences*

Destination communication

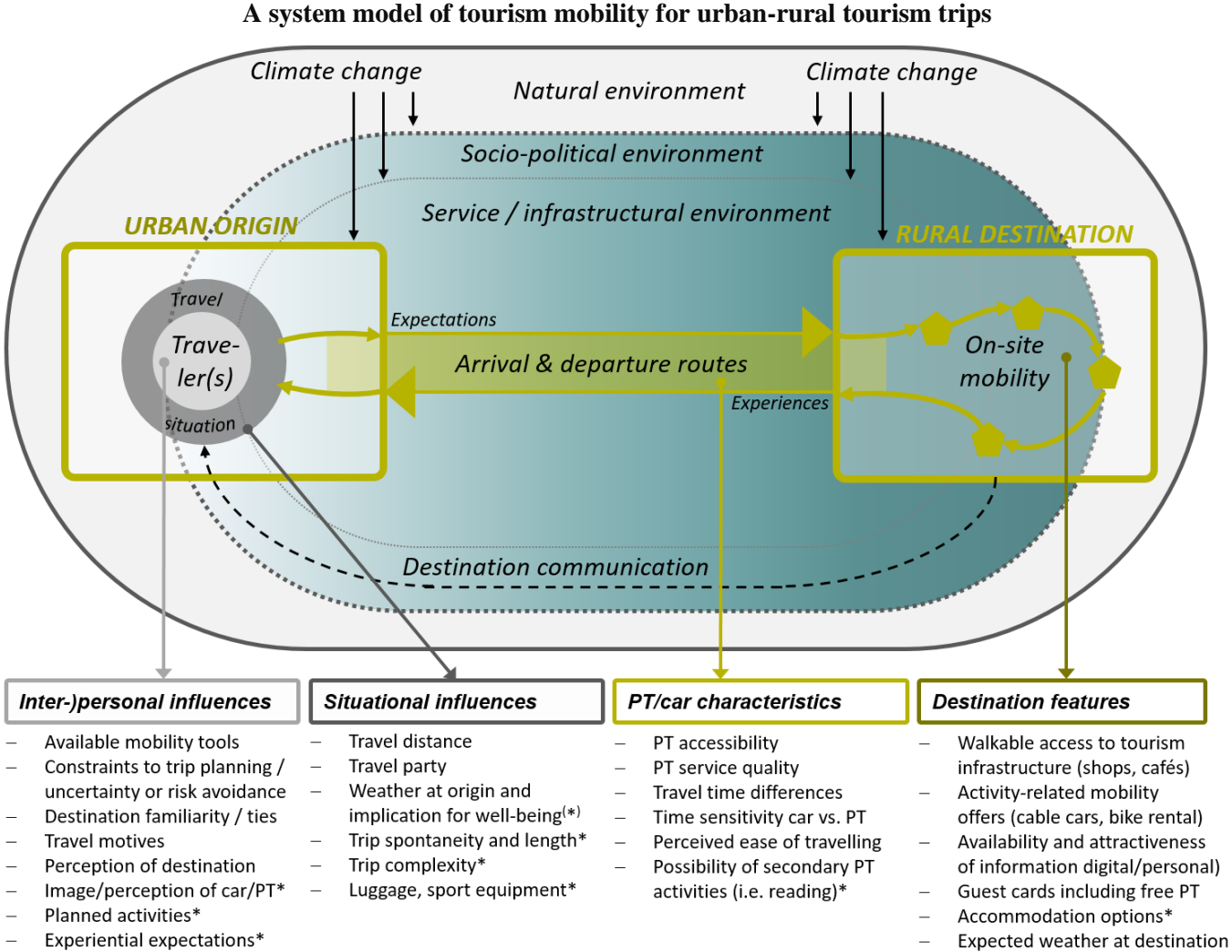| *Inter-)personal influences*	*Situational influences*	*PT/car characteristics*	*Destination features*
− Available mobility tools − Constraints to trip planning / uncertainty or risk avoidance − Destination familiarity / ties − Travel motives − Perception of destination − Image/perception of car/PT* − Planned activities* − Experiential expectations*	− Travel distance − Travel party − Weather at origin and implication for well-being^(*) − Trip spontaneity and length* − Trip complexity* − Luggage, sport equipment*	− PT accessibility − PT service quality − Travel time differences − Time sensitivity car vs. PT − Perceived ease of travelling − Possibility of secondary PT activities (i.e. reading)*	− Walkable access to tourism infrastructure (shops, cafés) − Activity-related mobility offers (cable cars, bike rental) − Availability and attractiveness of information digital/personal) − Guest cards including free PT − Accommodation options* − Expected weather at destination

Figure 3: A system model of tourism mobility for urban-rural tourism trips and the factors influencing these choices
Note: factors marked with a star (*) result from qualitative study elements, all others from quantitative or both study elements combined.

6.2 Factors influencing destination and transport mode choices (RQ1 & RQ2)

This section discusses the results with regard to the factors influencing tourism mode and destination choices (RQ1) and the relationship between them (RQ2). Building on the conceptual framework above, the discussions is structured along these dimensions that influence tourists and their mobility behaviour regarding both destination and transport mode choices.

(Inter-)Personal influences on tourism mobility choices

The findings from both qualitative methods and the MNL model have indicated the *collective nature of tourism decisions*, as previously discussed (Bronner & de Hoog, 2008; Gronau, 2014). Throughout the MNL model, this was shown by the importance of the travel company on mode choices (see Paper IV). The model on destination choice (see Paper III) has also presented a strong influence of the traveller's social surrounding, both as a wish to comply with their views (social norms) and the perceived pressure to do so (subjective norms). Similar results were reported from previous TPB-based destination contexts although cultural contexts play a role in shaping the effect size (Hsu et al., 2006; Cohen, Prayag, et al., 2014; Bianchi et al., 2017). Because personal and interpersonal factors are so strongly intertwined, they are discussed together in this section.

Other than in previous studies (Masiero & Zoltan, 2013; Le-Klähn et al., 2015; Gutiérrez & Miravet, 2016), *sociodemographic characteristics* did not have a significant influence in neither the destination nor the mode choice model. While this may be attributed to the homogeneity of the sample, it could also be a result of this specific study context of urban-rural tourism trips. Independent of age, gender and education, these trips are connected to family visits or other social ties in rural areas (see Juschten et al., 2017), possibly blurring the distinct boundaries between different travel segments. The only noteworthy influence were available mobility tools (cars or PT reduction cards, see Paper V). As highlighted for urban settings (Mitra & Saphores, 2017), their availability represents a path-dependency, directing the options to be considered.

Travel motives play an ambiguous role in the results of this thesis. According to Lam & Hsu (2006), push factors (as many travel motives are) are mainly useful for explaining the desire to travel while destination-specific pull factors (e.g. beaches or mountains) explain the specific choice of destinations. This could explain why the travel motives (esp. outdoor activities) turned out to be an influential factor on the self-reported intention to visit rural destinations, but had no influence in the joint mode-destination choice model, where pull factors were more influential.

Another influential decision driver is the *desire to avoid risks* related to travelling. Less frequently acknowledged in transport research (albeit the body of research on the importance of PT reliability is growing), this represents a widely studied field of knowledge in tourism research (Sirakaya & Woodside, 2005; Quintal et al., 2010; Karl, 2018). Within the TPB model, the influence of uncertainty was expressed through the significant role of perceived behaviour control on both current visit intentions and the intention under climate change influence (see Paper III). Destination familiarity through past experience is one potential strategy to overcome uncertainties, as illustrated by previous work (Bianchi et al., 2017) and by the positive effect of past behaviour on visit intentions in the TPB model (see Paper III).

Perceptions of different transport modes with regard to travel distance, time and speed are another important influence. The paper findings suggest that the relativity of time depends on the generated utility of it. As such, time spent on high-quality PT (train rather than buses) is perceived less negatively than time spent travelling by car because of the way it can be used in more enjoyable ways (see Paper V). This supports findings from previous studies that investigate the subjective meanings attached to time for different activities (Larsen & Guiver, 2013; Hössinger et al., 2020). Unfortunately, travel costs and the perceptions thereof were not included in this data set, which is why they could not be included in the model; income, however, did not have a significant influence on mobility choices. The New Zealand case study showed that the perception of transport modes also affected what was considered an option. In this regard, the strong dependence on automobility was re-produced by respective societal discourses and social stigma evolving around PT, especially buses, which were framed as 'loser cruisers' (see Paper VI). While the societal stigma against PT usage may be less strong among residents of most European cities (as also illustrated by the PT-related attitudes in Paper II), symbolic car use motives as well as habit have also shown to be important in European leisure studies (Anable & Gatersleben, 2005).

Within the New Zealand case study, *experiential expectations* of the tourism trip appeared to be influential for tourism destination and mobility choices. This includes people's desire to find remoteness and solitude (as opposed to crowdedness and encounters with strangers) in visited places; with privacy and family time as key aspired experiences. Those aspects were also mentioned in the Viennese focus groups and seem to also apply to other nature-based, more remote travel contexts (e.g. peripheral mountain areas in Switzerland, see Boller et al., 2010). Escaping societal expectations and feeling at home while travelling adds substantially to the trip enjoyment of some interviewed travellers in New Zealand, largely driving automobility developments. What is more contested is the notion of freedom, independence and fun associated with car travels. While some people perceive automobility as the definition of freedom and independence and largely enjoy being on the road, others feel stressed by the dangers and exogenous factors (weather, traffic, need for concentration), an aspect that was mentioned previously (Lumsdon et al., 2006; Hannam et al., 2014). Due to this association of driving as being stressful, these travellers perceive train trips as 'freedom and independence' because the associated peace of mind and lack of responsibility allows for a more enjoyable trip. What drives these differing perceptions remains unclear at this point and could be explored in future studies.

There are a number of factors that appear to be important in other studies, but were either not included or insignificant within the present one. Income or travel budget did not have a significant influence in any of the mode or destination choice models, which deviates from previous research (Gutiérrez & Miravet, 2016; Gross & Grimm, 2018). While accommodation prices were briefly mentioned as a constraining factor within the focus groups, income did not appear to affect any of the choices made. While this effect could be caused by an overly homogenous participant sample, it may also be an effect of domestic trips, which are also performed by low-income household, especially when combined with visits of family or friends. The dataset contained no other economic variable besides income (e.g. transport or accommodation prices or price differences), which is why these conclusion should be judged with caution.

Situational influences

The survey data used within this thesis dealt with the effects of climate change related heat waves on the tourism demand of Viennese travellers. The results showed that heat stress can represent a driver for tourism trips towards cooler (rural or mountainous) destinations. This influence is strengthened by the fact that most trips are short holidays with respectively short planning horizons. This is in line with previous studies that emphasized current and expected weather at both the origin and destination as an important environmental factor for destination choices and leisure activities, with influences varying, depending on planning horizons and trip durations (Scott et al., 2012). This finding is also supported by the focus groups and the Q-study, which show that weather represents a direct influence on domestic destinations choices because it may enable or inhibit certain weather-dependent tourism activities (Scott et al., 2012).

Besides the effect on destination choices, both the attempted tourism activities and the current weather at the destination were frequently mentioned to affect people's transport mode choices within the NZ case study (see Paper VI). Some travellers stated the importance of their car for flexibly adapting their destination choices depending on the weather conditions for performing their planned activities (such as hiking or windsurfing, which may both be inhibited by unfavourable wind or precipitation conditions). In this regards, both the decision for the trip in general and the chosen destination specifically were often made (and possibly adapted) spontaneously, which conflicts with the concept of pre-booking PT trips to obtain competitively priced tickets. Furthermore, the equipment needed for certain sports or children was mentioned as an inhibiting factor for PT usage (see Paper I and VI), while the car was valued for releasing travellers from the stress of having to choose luggage by capacity. This confirms the results of a previous study from Austria highlighting the importance of facilitating luggage transport for PT travellers (Bursa & Mailer, 2018). Lastly, trip complexity related to multi-destination trips was mentioned as an aspect that inhibits PT usage, since each additional trip leg needs to be planned ahead (see Paper VI), increasing both the planning time and risk of disturbances along the trip. Hence, for PT trips, complexity represents a burden, while for car trip it is associated with excitements and a sense of freedom, illustrating the different meanings attached to both modes.

PT and car characteristics

The results of the study outline the general importance of accessibility by PT for both mode and destination choices (see Paper I, IV, V and VI). Especially for households without a car, PT accessibility is a crucial element in filtering possible destinations (see Paper I and V), although the results suggest that car-free households are also willing to gain access to a (privately shared or rented) car when wanting to visit specific destinations (see Paper IV, VI). The quantitative results further emphasize the role of the attractiveness of the available PT network in terms of travel times, speed and type of available PT affects for tourism mobility choices, which were also relevant in other studies (Le-Klähn et al., 2015; Tomej & Liburd, 2020). Surprisingly, the number of required changes did not affect PT choice negatively (as the results of Gutiérrez et al., 2019 indicated). Unfortunately, the analysed data did not contain information on travel costs or value for money, an aspect that showed diverging results in previous studies (Lumsdon et al., 2006; LaMondia et al., 2010; Gutiérrez et al., 2019). Ultimately, PT travellers in Vienna appear less

sensitive to travel distances and times, which may be related to both the increasing speed over distance (due to high-speed networks) and the possibility to spend the time with secondary activities such as reading or sleeping (see Paper V). This illustrates that the PT service quality is not a purely objective feature since the perception of service quality as well as travel times and distances are highly subjective (Prideaux, 2009).

The qualitative studies further highlight the relevance of reliability and the perceived ease of travelling (see Paper I and VI). Both are considered lower for PT, as illustrated previously by the negative connotations of PT and multi-destination trips. The reasons frequently given for that are the complexity of trip planning and booking as well as the lack of knowledge on available mobility offers and alternatives in case of problems. Within the NZ study (see Paper VI), the fear of 'being stuck' at the destination was another frequently stated issue, which leads to the section on destination features.

Destination features

Within the destination, cross-sectional influences were found between tourism and transport infrastructures and destination and transport mode choices. As such, mobility options within the destination that provide the basis for interesting tourist activities (e.g. cable cars, bike rental) seem to be important factor in influencing destination choices. This supports previous studies emphasizing the double role that transport means can play both at the arrival and the destination level (Hopkins, 2020). The availability of tourism infrastructure in walking distance has been previously known to positively influence the attractiveness of destinations (see Hall & Ram, 2019). However, in the context of this thesis, its relevance for mode choices, in particular for PT-bound travels, has been emphasized. This corresponds with the findings from a UK-based study illustrating the relevance of good trails/paths in close proximity to other relevant amenities to strengthen positive meanings attached to walking and to allow for car-free independence (Smith et al., 2019) by reducing transport-related uncertainty (Thomas et al., 2018).

As claimed by previous research (Sparks & Pan, 2009; Scott et al., 2012), media and communication tools have crucial roles in shaping tourism choices. The paper findings suggest that the destination picture portrayed by media affects travellers' destination perceptions (see Paper I and III), which in combination with its online presence and online and in-person information provision affects the probability of destination visits (see Paper V). The same applies to guest cards including free PT, which also increase the likelihood of a destination being chosen and illustrate the strong relevance of transport offers and their quality for shaping the overall tourism experience (Gronau, 2017).

6.3   Evidence for behavioural change in response to climate change (RQ3)

Considering the emissions produced by the tourism sector on a global scale, we can conclude that the tourism system in its current configuration is not sustainable (Hopkins, 2020), despite some tourism forms representing notable exceptions (e.g. cycling tourism). By analysing factors that influence individual mobility choices, this dissertation ultimately gains insights on what inhibits willingness and ability of tourists to change their behaviour in response to the various effects of climate change on the environment, the political landscape and societal values.

Tourism behaviour change related to climate change

The presented papers indicate different forms of individual behaviour change in the tourism context. Within destination choices, these adaptive behaviours are usually intrinsically motivated and have direct positive consequences for travellers. The focus group respondents for example had indicated that they suffer from intensifying heat waves and are well-aware of the relief that trips to cooler, more rural areas can provide (see Paper I). Within the survey questions on general travel adaptations in response to climate change, about a fourth of respondents reported that they had already changed destinations, activities, or travel times of past trips (see Paper II). Within the modelling of visit intentions of rural Austrian destinations, people displayed a willingness to perform more (spontaneous) trips to nearby cooler rural places in case heat waves intensify in the future (see Paper III). The long-term implications of climate on destination choices are still largely unclear. While some studies conclude that climate change makes it likely that European travellers will move northwards to avoid the Mediterranean heat (Grillakis et al., 2016), other studies contest this view. Instead, they argue that unacceptably hot weathers are still too far away in the future, leaving people time to adjust (Rutty & Scott, 2010) or by stating that beach-oriented travellers are not the right target group for mountain holidays (Pröbstl-Haider et al., 2015). This last aspect, however, seems to disregard the possibility that people can be interested in more than one type of vacation, which was suggested by the results of Paper II.

For transport-related decisions, behavioural change of individuals in relation to climate change is much less direct and often driven by policy-makers (and their mitigation plans). In this regard, the results suggest that the increase of car-free households and PT usage in Vienna (see Buehler et al., 2017) has led to a substantial share of people wanting or needing to adopt different ways of travelling (see Paper IV). Surely, this change has not been entirely driven by the climate change debate but is a result of newly emerging technologies, changing societal values, and policies discouraging car use in Vienna. The most dominant 'adaptation' strategies (which, strictly speaking, represents a mitigation strategy with respect to climate change) involve temporary access to a car, PT usage or the choice of destinations that cater to the needs of tourists travelling without a car. Both the Austrian focus groups and the NZ case study highlight subjective constraints people face with regard to changes of mobility behaviour, which is why the next section focuses on drivers and barriers to behaviour change towards sustainable tourism mobility.

Barriers to individual behaviour changes in a tourism mobility context

Depicting all relevant drivers and barriers to behavioural change would clearly exceed the scope of this thesis. Therefore, this section will subsequently focus on four aspects that appeared as relevant yet partly ambiguous throughout the research process of this dissertation. These are (i) attitude-behaviour gaps, (ii) contextual, (iii) spatio-cultural, and (iv) temporal barriers.

 (i) One widely discussed constraint to behavioural change are *attitude-behaviour gaps*, also framed as attitude-intention gaps (Gnoth, 1997; Juvan & Dolnicar, 2014). What they both express is the disparity between a positive awareness or concern but a reluctance to actual behaviour change in that direction. Such patterns appeared both within the survey and the Q interviews. In the survey, there was a strong disparity what people thought others should do ('use PT') and their own willingness to comply (see Paper II). Within the Q interviews, participants actively realized

and addressed the contradiction between their own values or ideal realities and their personal behaviour regarding mode choice (see Paper VI). This was mainly attributed to habit, lack of attractive alternatives and lacking personal incentives to change. This suggests that the gap between a personal concern about the environment and the willingness to act upon this concern by sacrificing personal conveniences (see Thaller et al., 2020) does not only apply to air travel but also to car-based forms of domestic tourism mobility.

(ii) Another relevant aspect are *contextual barriers* referring to people leaving their environmental values and standards at home when leaving for vacations, displaying a form of cognitive dissonance (Ram et al., 2013). This aspect could also be described as a motivation gap, highlighting the strong importance of affective and emotional (rather than purely instrumental or rational) motives within travel-related decisions. Schlemmer et al. (2018), however, somehow oppose this view by describing a larger openness or curiosity of travellers towards new behaviours when being on holiday. While the study results include no indication that this applies to the trip towards the destinations, it appears relevant in the context of in-destination mobility. In this context, people already display high rates of active mobility (see Paper II) and seem to be more susceptible to fun-oriented yet sustainable mobility alternatives to the car (e.g. E-bikes).

(iii) The aspect of *spatio-cultural barriers* is specifically relevant in the context of this thesis, which focuses on tourist movements originating in urban settings (and related mobility structures) and directed towards rural, highly car-dependent settings. While urbanites display a high habitus of using PT in Vienna and often do not actually own a private vehicle (Buehler et al., 2017), they use the car nearly as much for domestic trips as other travellers (76% vs. 82%, see Paper V and WKÖ 2019), suggesting that they adapt to the local mobility culture, unless the behaviour corresponding to their personal habitus is easily and conveniently transferable.

(iv) The last aspect includes the *temporal barriers*, referring to the short time span between travel stimulus and the actual trip. Tourism trips in response to heat waves tend to be made rather spontaneously (see Paper I and II), as also illustrated by a Swiss study investigating travel behaviour of people's living in lowland areas during heat waves (Serquet & Rebetez, 2011). This increases the chance that people will re-visit familiar destinations to decrease the preparation and planning time and reduce associated uncertainties (Quintal et al., 2010). This familiarity could be used as a hook-in argument for increased PT travels if tourists can be convinced that destinations offer attractive options ensuring they will not 'get stuck'.

6.4 Contributions of the methodological approaches to the theoretical findings (RQ4)

We can find a strong divide between positivist quantitative and interpretive or narrative qualitative methods in both tourism and transport research (Ren, 2014; Lyons et al., 2015). This thesis argues that both are needed to capture the complexity of tourism behaviour. To do this, a mixed method design was developed that aimed to integrate different spheres of influence. The following section outlines theoretical findings that result specifically from this mix of different methods, and in doing so, demonstrates the value that arises from complementing or confronting the findings of different methods within a research design. After discussing these lessons learned, this section addresses the remaining challenges related to the goal of integrating qualitative and quantitative

methodologies within future studies. The author believes them to be rooted in ontological and epistemological disagreements that require alternative approaches to joint research projects.

The interplay of qualitative and quantitative methods and its relevance for the research outcome

Overall, the various existing statistical approaches have shown to be suitable for generating generalizable and transferable insights on or predictions for a large number of tourists. Both of these are relevant when considering the role of research in supporting policy and planning decisions. In this context, we can also observe an increasing relevance of big data in tourism research (Alaei & Becken, 2019). This allows to improve the understanding of human behaviour by complementing self-reported (survey) data with revealed preference data (see Paper V).

While quantitative tourism and transport research is strongly embedded in the ideals of objectivity and validity of results, there are doubts as to whether the dynamics and complexities of tourism behaviour can really be explained or predicted using reductionist modelling approaches and some selected examples from this dissertation will be outlined subsequently. One aspect, which is particularly relevant in the tourism context is the collective nature of decisions. Interdependencies between decision-makers were highlighted by previous research (see Bronner & de Hoog, 2008) and the results of this study (within focus groups, Viennese survey and Q-study). The involved uncertainties about the level of involvement of other travel group members raises the questions of the limits such a methodological individualism within standard survey methods. Instead, joint family surveys (see Bronner & de Hoog, 2008) or observations of the decision-making process can be suitable ways to overcome such limitations and reflect the increasing family democracy.

With regards to the effect of heat as a situational influence, the structured pre-telephone interviews and the focus groups indicated strong disparities with regards to the awareness of the influence of heat on tourism behaviour. Heat appeared to be an unconscious, affective or impulsive driver of choices which cannot be well-imagined from experience within surveys that assume people to report on rationalized, well-informed choices and the change thereof. While the survey results were not affected by this 'lack of imagination' (because it happened to start right in the middle of a heat wave), qualitative approaches might be more suitable for such contexts. They allow the researcher to actively 'set the scene' for people to re-imagine past heatwaves and their own emotional response to it. Both with regards to heat stress but also subjective motives for car usage for tourism trips, qualitative studies can delve into emotional rather than over-rationalized response mechanisms.

With regards to the importance of destination features for both mode and destination choices, the quantitative MNL model (see Paper V) provides valuable insights. The insights created through the merging of self-reported data with additional destination information (for example on the relevance of tourism amenities in walking/cycling distance) on both the chosen and non-chosen alternatives would not have been possible in other ways. In that context, the additional (trip or destination) data might be able to reveal decision mechanisms that the respondents would not necessarily have been aware of. While such an 'objectivist' stance may be seen critically, the chosen approach is a good alternative or complement to self-reported survey analyses. Further qualitative studies may help to explore more subjective experiences of such 'walkable/cyclable' destinations and the amenities that contribute particularly to the overall tourism experience.

With regards to the role of service quality features of PT, the mix of methods proved to be particularly relevant. While the quantitative results focussed on measurable differences in terms of sensitivities with regards to travel times and distances, the qualitative allowed for a much deeper understanding of the more emotional associations (of positive or negative kinds) towards PT use, partly in Austria and in the NZ Q case study. Aspects such as the desire (and habit) for privacy in a segregated space, freedom, fun, sense of control and the related unwillingness to compromise reflect the all-encompassing role automobility plays in modern lives (Gronau, 2014; Cohen et al., 2015). The deep-rooted establishment of automobility in our economic system, lifestyle and infrastructures affects behaviour in more ways than economic models can measure.

Especially with regard to such subconscious influence factors, mixed methods have shown to initiate valuable learning processes that reflect the dynamic nature of behavioural choices. The longer a participant is asked to engage with a topic, the more her/his understanding of personal behavioural motivations grows, stabilizing self-understanding and communicated notions thereof. This may result in increased awareness of personal priorities and the related justifications, an actual change of opinion or the realisation of personal contradictions; all aspects that are not captured within more 'static' survey approaches. This view is contested by Khoo-Lattimore and Prideaux's study (2013), who argue that participants of structured interviews may not be capable of expressing the factors guiding their decisions because the involved cognitive processes may be subconscious or not clearly traceable. Some of the Q participants, however, clearly expressed some form of 'realization' throughout the interview, displaying the desired awakening of consciousness of underlying cognitive processes. Examples of this are the Q-study insights on the role of social stigma, personal attachment to cars and their 'mirroring' of personal characteristics as well as inner conflicts around personal behaviours in relation to environmental values.

Remaining challenges of mixed-methods research

To a certain extent, researchers are trapped in the way they understand the world and disciplinary practices and expectations may only reinforce such mental frameworks. While being educated in heterodox economic theories, the thesis author works in an engineering-based transport environment with a positioning in quantitative modelling using different behavioural theories. Coming across more narrative, critical and qualitative research on the topic of tourism mobilities felt like the discovery of a parallel universe. Despite obvious ontological and epistemological differences (see Table 6 below), both approaches are characterized by a specific vocabulary leading to a certain in-group exclusiveness that may inhibit more integrated research approaches.

Table 6: Ontological and epistemological differences at the basis of the quantitative-qualitative divide

Positivist quantitative approaches (SEM, MNL)	Interpretive/critical qualitative approaches
Ontological beliefs	
Objective truth	Subjective experiences and perceptions
Static	Dynamic and systemic
Generalizability / transferability of results	Creation of context-specific meaning and relevance
Epistemological beliefs (see Ren, 2014)	
Independent (objective but increasingly also subjective), itemized influence factors that add up to explaining reality	Narrative account of people's subjectve reality, with a range of interconnected influence spheres
Focus on representativeness and validity	Focus on reflexivity, transparency and dialogue

When reflecting upon the classical design of mixed-method studies (including this dissertation and the conceptual model visualizing its findings), it becomes apparent that a mere combination of methods does not combine the 'best of both worlds' because it might still impose a reductionist, positivist mind-set to a qualitative set of methods. This could be mitigated in different ways: (i) A first option is to not only combine the pure methods (e.g. interviews and questionnaires) but rather blend together some of the guiding principles underlying both strands of research (see Table 6 above and Ren, 2014). One way to do this is to apply the critical self-reflective process to survey or other quantitative methods to critically examine the researcher's positioning, as done by Lyons et al. (2015). A second way is to include aspects of reflectivity within the survey design and allow participants to critically engage with their own previous answers. A third way is to apply the critical realist concept of retroduction within the data analysis and critically examine the answers provided by survey respondents and possibly address them again to delve into the structure and mechanisms leading to their specific understanding of reality (see McAvoy & Butler, 2018). (ii) A second option is to aim for 'true' interdisciplinarity (not as an empty claim) in research projects as a way to integrate different perspectives and overcome divide between strongly interpretative and strongly reductionist mind-sets and resulting biases. Ideally, this requires people from all involved fields as well as people who can effectively translate between them.

6.5   Practical implications of these findings

The results of this thesis have multiple implications with regard to policy-making and tourism planning, especially in light of Austria's and New Zealand's goal of reducing GHG emissions (BMLRT, 2019; Ministry for the Environment & Stats NZ, 2019). Within Austria's National Energy and Climate Plan, decarbonisation of the transport sector is one of the key objectives, targeting both a change of modal split from cars to active and public transport modes as well as an increase of electric vehicles. Tourism is only mentioned in relation to its transport emissions and policies for sustainable tourism mobility, which is the focus of this section. Drawing on theoretical and empirical insights, a long list of measures could be suggested. Three strategies targeting individuals will be presented that seem particularly relevant in light of the presented results. In doing so, this section does not wish to undermine the imperative to also address other stakeholders in the tourism system as well as inherent power structures and underlying paradigms (e.g. embeddedness in the growth paradigm or uncritical techno-optimism, see Becken, 2019).

Make alternatives accessible: Previous research on environmental behaviour of Austrians suggests that few people are willing to sacrifice personal conveniences to comply with their self-reported concern for the environment (see Thaller et al., 2020). While increasing this willingness is a desirable goal, change may appear faster if destinations manage to make PT or active modes the more convenient option. In that context, the present study emphasizes the importance of transport-related accessibility and service quality as a factor influencing destination attractiveness. Travel time and the type of PT (train vs bus) were influential factors, while other studies also highlight the importance of required changes and travel costs (Gutiérrez et al., 2019). This also requires improved accessibility of relevant tourist attractions and activities, as highlighted before (Tomej & Liburd, 2020). The mutual influence of tourism and transport features on mode and destination choices (see Paper V and VI) emphasizes the need for

cooperation between stakeholders across disciplinary, spatial and administrative boundaries. This could be done by means of an integration of PT and tourism offers, including combined bike and rail/bus offers, safe and attractive bike routes, or transport offers (e.g. kayaks drop-offs, hiking buses) allowing for independent, non-circular trips. Besides PT and active mobility options, electric vehicles (EV) are another possible sustainability pathway within tourism systems. Especially in very car-dependent tourism settings (such as NZ, see Hopkins & Stephenson, 2016), EV can be an attractive and 'fun' element among others of a transition to environmental sustainability (see Paper VI). As all tourist services, respective services should be tailored to different traveller groups, which requires an in-depth understanding of a destination's tourist portfolio, related target groups and actual structure of the pool of visitors.

Make alternatives attractive: Both this and previous works have highlighted the importance of emotional and symbolic motives of car use for tourism/leisure (Anable & Gatersleben, 2005; Hannam et al., 2014), suggesting that destinations should emphasize the intrinsic values and enjoyment of slow or sustainable transport forms (e.g. walking, cycling, kayaks). In doing so, the objective is to switch the role of transport from a mere necessity into an appreciated element of the tourism experience, for both the arrival and in-situ mobility. Such efforts may be facilitated by using social marketing and nudging techniques (Hall, 2016) and a range of communication channels to address travellers both before and during their travels. Content-wise, the following aspects may be highlighted (see Paper V and VI): *For active transport modes*, the feelings of physical achievement and adventure, the flexibility to make non-circular trips, the enjoyment of sceneries and surrounding nature, the palpability of the road/path, the privacy within the travel party, as well as possible access to remote car-restricted sights are possible starting points. For *PT modes*, time use possibilities during the trip are worth highlighting. *EV trips* also have the potential for enhancing the travel experience since they are perceived as more fun and 'cool' than conventional petrol cars (see paper VI). Respondents also highlight that EV can enhance the touristic discovery of formerly 'driven-past' communities since they still require more frequent charging stops. As such, local PT and EV charging infrastructure can act as a '*gatekeeper to (...) host-tourist interactions*' (Hall, 1999, 53), also in Austria.

Make transitioning easy: Both previous research and the papers of this thesis emphasize the importance of risk aversion and uncertainty prevention in tourism decisions (Quintal et al., 2010; Karl, 2018) or transport choices (see Paper III and VI). Therefore, the transition to sustainable travel modes should ideally be 'the easy choice', with a focus on the ease of planning and performing the trip. Clearly, this requires comprehensive yet well-arranged and up-to-date information – available upfront and online as well as in person at the destination - on transport options within the destination in relation to relevant tourist attractions. When aiming to increase the ease of in-destination planning and visibility of information, enhanced cooperation between various tourism and transport stakeholders within spatially close destinations and across regional boundaries is critical (as emphasized within the regional future workshops, see Paper II). Furthermore, the findings on the perceived complexity of PT trip planning (see Paper III, IV, VI) suggests that destination and transport planners shall consider the entire trip chain (at home, along the route and within the destination) as well as the complexity of family decision-processes and involved needs and preferences when developing and communicating sustainable mobility offers.

Chapter

7

RECAPPING CONTRIBUTIONS AND WAYS FORWARD

This section first summarizes the results of all six papers and their core theoretical and methodological contribution to the field. It then reflects upon the limitations arising from the applied methods, thereby serving as a starting point for the highlighting of future research needs and possible changes to the methodologies applied. This section closes with a short account of the author's concluding thoughts.

7.1 Summary of results and contributions

This thesis started off with the objective to foster the understanding of relevant factors influencing destination and transport mode choices in the context of urban-rural tourism trips. As such, the study deals with a combination of decisions in a complex interdisciplinary context under the influence of climate change as an external stimulus. The six papers included in this thesis make the following contributions to the literature (see Table 7).

Table 7: Key results of all six papers included in this thesis

Paper	Key results
Introduction of study context and factors influencing urban-rural destination choices	
Paper I	– Viennese citizens have positive associations with the term 'Sommerfrische', partly disconnected from the original concept and its characteristics (repetitive, long-term vacation for the entire family), representing a potential for a revival. Time with family still represents a core travel motive, with travel decisions often being made collectively. – The spontaneity of heat escape trips from cities is perceived as both a need and a challenge.
Paper II	– Urban travellers have the following preferences and travel patterns when visiting domestic rural destinations: rather short, close to mountains and lakes, predominantly done by car. – Heat stress may be a potential push factor of increasing rural tourism, with Viennese residents already adapting their leisure and travel habits to times of heat. – There are three groups of travellers with distinct travel motives. They can be characterized in terms of sociodemographic features, attitudes, and travel preferences.
Paper III	– Subjective norms, media influence, travel motives and past behaviour and perceived behaviour control (PBC) shape the intention of Viennese people to visit rural Austrian summer destinations. – Increasing heat stress has a positive influence on future visiting intentions. – Past behaviour and PBC are believed to shape mode choices.
Urban-rural mobility patterns & the relationship between mode and destination choices	
Paper IV	– Car-free households feel more constrained to visit rural destinations (regarding PBC). – Their coping behaviour involves several types of strategies including travelling less or to alternative (PT-friendly) destinations, and gaining access to other transport modes (i.e. PT usage, privately or commercially rented cars). – Car-free travellers cluster in specific Austrian tourism destination, which tend to be small but relatively tourism-focussed and well-accessible by PT.
Paper V	– Tourism destination and transport mode choices are mutually influential. – On-site mobility offers (rental bikes, cable cars, rental boats) increase overall destination attractiveness, whereas the accessibility of local tourism facilities by foot/bike increases likelihood of PT usage. – Car and PT travellers respond differently to travel time, speed and distance, with car users being more sensitive to speed and distance than PT users. – Type of PT vehicle matters to users, with buses being perceived as less attractive than trains. – Destination branding and the availability of online and in-person information on mobility and tourism aspects is the strongest influencing the overall destination attractiveness.
The role of automobility within urban-rural tourism trips (NZ case study)	
Paper VI	– Urban-rural tourism mobility in NZ is related to several, mainly positive, notions of automobility: stress-reduction, inherent enjoyment, privacy within chosen travel group, stress and fatigue, functional necessity, mobility as essential element to the tourism experience. – The comparison of quantitative and qualitative study elements shows discrepancies with regard to two aspects: (i) the role of status related to cars/buses as well as (ii) the importance of environmental values within mobility choices. – Buses are perceived as the least attractive alternative to fossil-fuelled cars compared to more attractive trains and the positively (although sceptically) viewed alternative of EV.

This thesis contributes to the current state of knowledge by bringing together tourism and transport research, two fields often analysed in separation with regard to the respective consumer choices (transport mode / destination choice). By presenting results on crucial influence factors for the chosen decision context, it contributes to theory-building on urban-rural tourism mobility, adding to existing research on urban (e.g. Klinger et al., 2013; Le-Klähn et al., 2015) and rural tourism mobility (e.g. Guiver et al., 2013; Smith et al., 2019; Tomej & Liburd, 2020) as well as urban-rural tourism motivations (Woods, 2011; Gon, 2017; Holden & Lupton, 2017). In depicting influential choice factors for destination and mode choices, this thesis also identifies barriers to and drivers for individual behaviour change. This serves as a basis for outlining possible policy and practice directions for the development of sustainable travel options toward and within rural tourism destinations.

Apart from the findings highlighted in Table 7, the results of this thesis identify the crucial role of uncertainties, the collective decision context, as well as emotional or symbolic motives within tourism mobility decisions. Based on these insights, this dissertation argues that decisions in a tourism context are taken differently than every-day mobility choices, as outlined previously. In light of these differences, this thesis contribute to a discussion on the benefits and limits of different qualitative and quantitative research methods in the tourism context. By contrasting and complementing each other, such mixed-methods can, if properly integrated, help fill existing research gaps or open up new relevant research directions, especially in newly-arising and dynamically changing tourism contexts.

7.2 Limitations, further research and concluding remarks

This dissertation comes with a number of limitations and resulting suggestions for future improvements that are worth pointing out. First, the quantitative survey underlying the first five papers was designed as a cross-sectional study. These cannot be used to make a statement on changes over time, which would be particularly interesting in the context of behavioural adaptations to climate change. Future studies could consider creating longitudinal data to investigate changes over time, as suggested previously (Cohen, Prayag, et al., 2014). Second, the segmentation analysis (as done within Paper II) has surely been influenced by the participant pool within the Online Panel, which appears to be rather homogeneous. More representative recruiting and/or sampling techniques may alleviate this aspect in future studies. Third, in contrast to these quantitative elements, the Q-study represents a mixed-method approach exploring different viewpoints related to automobility for tourism in NZ. A representative, quantitative account of the share of each of the identified mobility styles within NZ's population could provide a good basis for developing target group-specific policy and planning instruments (see Gronau, 2014).

From a methodological point of view, this study has shown that a combination of quantitative and qualitative methods is valuable. Econometric models with their focus on quantifiable and 'reasonable' choice influences can provide pertinent insights by themselves, but their explanatory power is limited for tourism decisions, which are largely shaped by inter-personal power dynamics that restrict personal agency (Cohen, Prayag, et al., 2014). Therefore, this study gained many insights from its qualitative research parts, highlighting the emotional value of tourism travels and related needs and expectations.

This thesis, however, concludes that a mere combination of methods (i.e. pre-survey interviews to retrieve relevant factors for the subsequent quantitative analysis) does not manage to actually combine the 'best of both worlds' as often aspired to. Instead, such an approach might still impose a reductionist, positivist mind-set to a qualitative set of methods. As highlighted previously, this could be mitigated by combining some of the guiding principles underlying both strands of research rather than simply applying two methods. Examples include qualitative principles of reflexivity, transparency and dialogue that could be blended with quantitative principles of validity and generalizability (see also Table 7). Methodologically, this could involve a stronger critical self-reflection on the researcher's biases and positioning (see Lyons et al., 2015), as well as a critical examination of the respondents' answers followed by a dialogue that allows participants to critically engage with their own previous answers (see McAvoy & Butler, 2018). In doing so, quantitative research could encourage 'true' interdisciplinarity between different strands of tourism and transport research and integrate different perspectives that help bridge the divide between interpretative and reductionist mind-sets.

While this research has shown the importance of PT supply quality for tourism mobility choices, further studies may deepen the understanding of this aspect. This could be done by including further service quality aspects such as the cleanliness of vehicles, perceived safety, comfort of stations, constraints related to luggage transport and ease of ticket access. With the survey methods used so far, such data cannot be generated. They would require more resource-intense surveys on travel satisfaction or discomforts (Le-Klähn et al., 2014), which could be considered in future analyses. Especially the issue of luggage transport seems pertinent (and most likely inhibiting) in the context of tourism travel by PT (see Dickinson & Robbins, 2008; Bursa & Mailer, 2018). Future research should focus on this aspect in more detail and investigate the attractiveness of available luggage transfer options and the effectiveness of different measures concerning mode choices. Furthermore, this study suggests that the accessibility of local tourism and transport amenities by walking/cycling as well as regional PT connectivity to nearby attractions might play an important role for intra-destination mobility (which in turn also affects mode choices for arrival). Further insights are needed to explore what the local amenities are that decrease car dependency while improving the overall tourism experience.

Overall, the present study contributes to an understanding of the complex nature of tourism mobility choices and, in doing so, may support the understanding of transition processes towards sustainable mobility in Austria and beyond. To do so, this study has provided insights on a wide range of personal, interpersonal, situational as well as PT and tourism supply-related influences on tourism destination and mode choices. Drawing on these insights and the findings on barriers inhibiting behaviour change, a number of policy- and planning-related starting points were outlined. While none of these suggestions might be entirely new, Friedman might agree that this time of ecological and health crisis (especially for the tourism industry after months of collective, state-ordered immobility) might be a good time for re-visiting these suggestions. The increasing number of domestic tourists (especially among car-free households known for their affinity towards international, air-based travels, see Ornetzeder et al., 2008) could represent a true chance for destinations to re-position themselves and for policy-makers to change their transport-related priorities. This thesis hopes to contribute to the scientific basis that makes such changes possible.

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APPENDIX

Appendix 1: Original survey in German language

Appendix 2: Variable list in English (translated from original)

Both appendices are places in an online repository and can be viewed using the following link:

http://ive.boku.ac.at/Juschten_Appendix/

PART II - PUBLICATIONS

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Paper / Book chapter

Author's contribution:

The thesis author was responsible for the qualitative analysis of focus groups underlying the paper as well as the write-up of German-speaking version of the methodology and results sections (which were translated to English for this book chapter by the first author). She also contributed text parts to the discussion and commented on the overall manuscript.

FW was the main contributor. He developed the overall structure of the chapter and wrote substantial parts of the literature and discussion sections. He translated the German-speaking version of the methodology and results sections into English. CF helped with data analysis and write-up. AJP and WU contributed to the discussion section. All other authors reviewed the paper.

CHAPTER 1

'SOMMERFRISCHE' IN TIMES OF CLIMATE CHANGE: A QUALITATIVE ANALYSIS OF HISTORICAL AND RECENT PERCEPTIONS OF THE TERM

Fabian Weber, Maria Juschten, Carina Fanninger, Christiane Brandenburg, Alexandra Jiricka-Pürrer, Christina Czachs and Wiebke Unbehaun

ABSTRACT

With an increase in hot days, tropical nights, and heat waves, assumedly more residents of large cities will seek rest and recreation in higher-altitude tourism destinations during the summer. This phenomenon is referred to as the revival of 'Sommerfrische' (summer freshness or summer retreat). This chapter examines the impact of climate change on summer tourism in the Alps by urban residents. It scrutinizes the historical perception of the term Sommerfrische, *as well as the understanding and perception of this term today, based on an extensive literature review and two focus-group discussions. The findings form the basis for specifying the attributes that can be used to describe a modern form of* Sommerfrische. *The results indicate that today's understanding of what* Sommerfrische *could be and the attributes of* Sommerfrische *travel are very different from the historical phenomenon. Nowadays, summer excursions and short trips to destinations close to cities are considered to be* Sommerfrische *as*

long as they have escape from the heat as a common motive. The results demonstrate the broad interest of urban residents in Sommerfrische *and also suggest avenues for further research on the adaptive behavior of town-dwellers in hot summers with respect to the extent of their actual and potential future travel behavior.*

INTRODUCTION

Climate change has diverse impact on tourism, on both the supply and demand sides. Various authors (cf. Götz et al., 2012; Müller & Weber, 2008; Pröbstl-Haider, Haider, Wirth, & Beardmore, 2015) assume that, given the increase in heat days, tropical nights, and heat waves, more residents of large cities will seek refreshment in higher-altitude rural tourism destinations during the summer. This phenomenon is referred to as a revival of *Sommerfrische*, a common form of upper-class travel during the summer performed by urban residents in Austria in the eighteenth and early nineteenth centuries.

As consequences of climate change, increases in heat waves, and hot summers in European cities are expected. In the city of Vienna, for example, days with temperatures above 30°C have already increased from nine days a year in 1961–1990 to 15 days a year in 1981–2010 (ZAMG, 2016). By 2040, on average every fourth day in summer could be a heat day (Kromp-Kolb, Formayer, & Clementschitsch, 2007).

Several studies (such as Chladek, 2005; Fleischhacker & Formayer, 2007; Serquet & Rebetez, 2011) see this development as an advantage for tourism in rural mountain destinations close to urban agglomerations. They might become more attractive for tourists who seek relaxation and refreshment away from urban heat. While a wide range of scientific articles exists on the impact of climate change on winter tourism, much less literature is available on the impact of hot summers on Alpine tourism and on how urban residents adapt to summer heat.

Given that the new potential for summer tourism in rural mountain areas can be derived from the adaptation of urban residents to an increasing number of heat days and tropical nights, the question arises as to whether the traditional concept of *Sommerfrische* can be revived. This requires a more thorough understanding of how people conceptualize *Sommerfrische* in order to discuss whether the term might need to be redefined with the objective of using it as a successful climate change adaptation strategy in tourism.

Against this background, this chapter aims to examine the understanding and perceptions of the term *Sommerfrische* today. The chapter is based on the research project REFRESH (ACRP 8th Call), the aim of which was to evaluate whether and how residents of large agglomerations adapt to urban heat in their recreation and travel behavior. Further questions include the role of *Sommerfrische* as one possible adaptation strategy and how nearby mountainous regions may respond to this demand by creating sustainable tourism offers and travel options.

This chapter focuses on the historical and recent use of *Sommerfrische* as a way to adapt to hot summers in large European cities under conditions of climate change and the respective associations of the term of *Sommerfrische*.

The results should allow first, to determine the associations connected with the term *Sommerfrische* and provide initial insights into its potential as a strategy of adaptation to urban heat for rural mountain destinations, and secondly, to build a basis for future quantitative research that aims to examine the actual and intended travel behavior of city dwellers in hot summers. In this chapter, evaluating how the term *Sommerfrische* is perceived is based on an extensive literature review and two focus-group discussions.

The structure of the chapter is as follows. First, an extensive literary review analyzes the different definitions and historical development of the term *Sommerfrische*. In this section, the impact of climate change on travel behavior is also examined. The second section explains the methodology of the focus-group discussions and the most relevant results from these sessions. Finally, the results are discussed and conclusions drawn, including suggestions for further research.

LITERATURE REVIEW

The concept and prospects of *Sommerfrische* were defined and analyzed on the basis of the existing literature, and the impact of climate and climate change on travel behavior in the Alps in summer was also analyzed. This literature analysis served the purpose of informing the guidelines of focus-group discussions with two types of stakeholders. These focus groups aimed at investigating in greater depth the current perceptions, importance and possible attributes, and preferences associated with such travel.

The Term Sommerfrische *(Summer Freshness)*

Kabak, Wacha, and Wochinger (cited in Schmidt-Lauber, 2014) carried out an analysis of travel guides and lexicons in researching the term *Sommerfrische*. In the Grimm brothers' German dictionary of 1905, *Sommerfrische* was described as a 'holiday for town-dwellers in the countryside during the summer (…) also the location thereof' (Grimm, 1526 cited in Schmidt-Lauber, 2014, p. 65) and in the *Brockhaus' Konversations-Lexikon* from 1898 as 'health resorts' (literally, 'climatic resorts'). The travel guides of the period also use the idea of a medicinal, healthy purpose to such travel to describe *Sommerfrische*. Kos (1995) defines *Sommerfrische* similarly as a 'tranquil sequence of largely interchangeable amenities' and the ability to remain somewhere, in contrast to journeys involving continuous changes of location. For Kos (1995), the idea behind '*Sommerfrische*' is one of 'the slowing down of life, of continuous presence rather than manically zipping through nature and landscape' and as 'a time for oneself rather than a time for travel' (Kos, 1995, p. 15).

Over time, however, the health aspect faded, and the word was even removed completely from some dictionaries. In the 1980s, it began to appear again, frequently with the qualification 'outdated'. Today the term is again being used

more frequently, especially in advertising food and beauty products, primarily to signal 'freshness'. It is also widely used in the Austrian tourism sector.

Schmidt-Lauber (2014) differentiates between *Sommerfrische* and the modern, more usual term 'holidays' on the basis of the following criteria. First, *Sommerfrische* refers to a longer stay during the summer months, which usually takes place in the same location, as opposed to journeys with changing destinations. Secondly, people did not go on *Sommerfrische* with the objective of learning new things or enjoying a wide range of entertainment offers, but rather with the intention of recuperation and recreation through and in nature (Schmidt-Lauber, 2014, p. 21f.)

By now, Weigel (2014) states, the term is also being used for shorter stays in *Sommerfrische* destinations, which means that the classical *Sommerfrische* has all but gone (Weigel, 2014).

Historical Development of Sommerfrische

The Roman aristocracy already knew the tradition of leaving the airless, stinking, hot cities in the summer, and retreating to their country seats. This tradition was revived in Renaissance Europe by aristocrats and wealthy town-dwellers (Tworek, 2011). During the summer, urban citizens increasingly escaped from the hot and unhealthy cities, with their annual epidemics of typhoid and dysentery, poor quality water, and stuffy air. *Sommerfrische* had its heyday around the turn of the eighteenth to nineteenth centuries. The extension of the railway into rural areas and the period of rapid economic growth in Central Europe in the nineteenth century made new destinations for *Sommerfrische* accessible and affordable to a wider clientele. In towns and in the countryside, villas increasingly became suitable residences for the bourgeoisie, and whole landscapes were transformed into urban enclaves with the appropriate infrastructure.

For the vast majority of the Austrian population, *Sommerfrische* was not only a financial luxury but also one that required the luxury of time, because statutory holiday entitlements were only introduced at the beginning of the twentieth century. The local population benefited from the newly built infrastructure (transport, postal services, health care, safety installations, etc.), and discovered new types of luxury and cultural trends from the better-off urban residents (Weigel, 2014). *Sommerfrische* travellers always took and still take the town with them to the country (Kos & Krasny, 1995, p. 12).

Sommerfrische activities included good food, walks, seaside resorts, and concerts by spa orchestras (Haas, 1992). Not until the twentieth century, sporting activities such as swimming and rowing became an increasingly popular part of *Sommerfrische* (Schmidt-Lauber, 2014).

In addition to the classic nuclear family and their staff, a party of travellers might also include single aunts and uncles, friends' children or grandparents (Kröncke, 2009, cited in Schmidt-Lauber, 2014). For wives and pre-school children *Sommerfrische* often lasted from Whitsun to September, with husbands joining them at weekends, and, if the distance allowed it, people commuted daily

(Haas, 1992). Often, families visited the same *Sommerfrische* destination for generations and considered it to be more their home than the city.

The First World War and the inflation of the 1920s brought a sudden end to the classic *Sommerfrische* phenomenon. Between the wars the expression was revived again, but in a different form that owed its existence to the rise of the middle classes (Haas, 1992). After the Second World War, the classic *Sommerfrische* could not be revived again, mainly because holiday destinations had changed and international mass tourism had developed. Some of the former *Sommerfrische* destinations in the region around Vienna became destinations for day trips and eventually became permanent places of residence (Grün & Benesch, 2005) or second homes (Kos, 1995). In the early 1990s, Haas (1992) recognized a trend toward a revival of *Sommerfrische*.

Among other things, this trend might be reinforced by the increasing urban summer heat caused by climate change. In order to discuss the potential arising from this development, a brief excursus into the impacts of climate change on tourism and the decisions and preferences of tourists, in particular, will follow.

Influencing Factors and Impact of Climate Change on Travel Behavior in Summer

Destination choices and travel motivations are determined by a variety of individual factors and preferences, including climate conditions, the attractiveness of the landscape, the tourism portfolio of destinations, safety and security issues, and travel costs. Many of these factors are influenced directly or indirectly by climate change. The potential impact of climate change on tourist behavior is therefore considerable (Abegg, Steiger, & Walder, 2013).

In their report on 'Climate change and tourism in Austria 2030', Fleischhacker, Formayer, Gerersdorfer, and Prutsch (2012) set out the consequences of climate change for nature in the regions visited by tourists. Shifts in vegetation zones, changes in the composition and diversity of species, and the retreat of the glaciers will change the Alpine landscape. Research undertaken by Krajasits et al. (2008) for the research project 'Alpine summer tourism in Austria and possible effects of climate change' (funded by StartClim 2007) showed that the projected effects of climate change in Austria could extend the summer tourism season both before and after high season.

According to Krajasits et al. (2008, p. 12), the increasing heat in the cities could 'increase town-dwellers' demands for local recreation at weekends and the desire for short breaks. Alpine and lake tourism would be the prime beneficiaries.

When analysing demand, a distinction must be made between short- and long-term decisions. The choice of a main holiday destination depends very much on the climate in the destination country, while spontaneous short holidays are more frequently booked because of the weather (Krajasits et al., 2008). The climatic conditions in the source (push) and the target (pull) regions are what matters. In the Alpine region, leisure activities are frequently hampered by poor weather conditions, which is why a warmer climate could mean better conditions for tourism in the summer (Tamme, 2012). Fleischhacker, Formayer, Seisse, Wolf-Eberl,

and Kromp-Kolb (2009) believe that, due to the increasing number of heat days, tropical nights and increases in water temperatures, holidays by the lakes in the Alpine region will benefit. A representative online survey of Austrian holidaymakers (Fleischhacker et al., 2009) showed that, following a series of extremely hot summers with unattractive conditions in the Mediterranean, 28% of beach holidaymakers stated they would no longer go there but instead opt for local lakeside holidays, while 16% said they would switch from holidays by the water to other options such as hiking holidays and holidays in the mountains. A 22% share of summer holidaymakers said they no longer fly, and a further 10% were planning to give up flying. Twenty-seven percent preferred several short trips to one long holiday, and 15% were planning this for the future.

A survey of tourists and second home-owners in the Lake Attersee region (Pröbstl, Greil & Wirth, 2012; cited in: APCC, 2014) showed that, under conditions of temperature rise and additional hours of sunshine, 80% of second home-owners are intending to spend more time in the region. Tourists stated no comparable change in behavior to that of the second home-owner. The degree of freedom in making travel decisions is limited by the number of days of vacation and the distances between the place of residence and the tourism destination. Therefore, they are less able to change their behavior and contribute to greater added value. Fleischhacker and Formayer (2007) also found that good summer weather in lake regions has a stronger influence on domestic demand than on overnight summer stays by holidaymakers from abroad. In comparison, little sensitivity is noticeable in summer tourism in the sectors of conference tourism, city, spa, and health tourism, whereas Alpine and lake tourism is characterized by a higher degree of sensitivity to climatic and weather conditions.

In their study of German tourists using a sample of 1,135 people between 18 and 69 years, Pröbstl-Haider et al. (2015) conclude that additional days of sunshine in the Alps would be more beneficial to summer destinations attracting activity- and leisure-focused visitors than to summer destinations focused on experiencing nature. Visitors seeking the latter will travel regardless of the weather. However, the authors consider it to be unlikely that holidaymakers will change their destination from the Mediterranean to the Alps, as the mountains cannot fulfill the expectations of travellers focusing on water and the sea (Pröbstl-Haider et al., 2015).

Based on various studies (Abegg & Steiger, 2011; Amelung & Viner, 2006; Ehmer & Heymann, 2008; UNEP, WMO, & WTO, 2008), the authors of the Austrian status report, *Climate Change 2014*, came to the conclusion that summer tourism in Austria benefits rather from climate change in Europe in terms of longer summer seasons, as well as generally dryer and warmer conditions. They conclude that the Alps are highly likely to become the future *Sommerfrische* for town-dwellers and central and southern Europeans affected by heatwaves. The Mediterranean, which is currently the most important summer destination in Europe, might become less attractive in summer as a consequence of increasing heatwaves (APCC, 2014).

In Switzerland it is likely that, compared to more southern destinations, the Alps with their cooler mountain regions could benefit from more frequent

hot spells. In a study by the Swiss Federal Institute for Forest, Snow, and Landscape Research (WSL), Serquet and Rebetez (2011) investigated the impact of hot summer days on tourism in the Swiss Alps by analysing the number of hotel guests in 40 Alpine holiday destinations in Switzerland with reference to the summer temperatures in the lowlands. The results showed a significant correlation between the number of overnight stays in Alpine holiday destinations and hot temperatures in the lowlands. Tourists responded quickly to rising temperatures and booked more overnight stays in hotels in higher altitudes. The greatest impact of high temperatures on overnight stays was recorded in Alpine holiday destinations near densely populated areas. For the future, it is assumed that rising temperatures will lead to tourists visiting Alpine holiday destinations more frequently and for longer periods (Serquet & Rebetez, 2011).

As a first in situ study of a mountain region, Steiger, Abegg, and Jänicke (2016) carried out a survey of summer tourists in the Bavarian Alps (District of Miesbach) and found that the importance of weather preferences and weather sensitivity depended on the socio-psychographic profile and travel behavior of the tourists according to age, family status, and the categories of sporting- or leisure-focused tourist and first or repeat visitor. Clivaz et al. (2012) conclude that the shift from winter holidays in the Alps to Alpine summer holidays is still of minor importance. 'For the future, however, experts expect a rising tourism potential in the warmer half of the year, and in particular in the sector of nature tourism' (Clivaz et al., 2012, p. 22).

Findings Based on Literature Review

Because of climate change and the increasing prevalence of hot summers, several authors (cf. Götz et al., 2012; Müller & Weber, 2008; Pröbstl-Haider et al., 2015) now believe that *Sommerfrische* can experience a revival.

However, the current understanding of *Sommerfrische* is only tangentially related to the original idea, as studies such as Weigel's (2014) confirm. Nevertheless, certain links to the traditional concepts exist. The study *Transformation of Sommerfrische* (Schmidt-Lauber, 2014) investigated several current forms of summer routines, which, like the classic *Sommerfrische*, include a longer-term shift of the main place of residence to a rural location.

Stöttinger (cited in Schmidt-Lauber, 2014) defines modern *'Sommerfrische'* in a second home as a seasonal multi-location practice, neither a holiday nor a weekend trip, but a permanent or sequential shift of everyday life from the town to the country for a longer period of time. This practice is made easier by the prevalent trend toward greater flexibility and mobility of work.

Aichberger (cited in Schmidt-Lauber, 2014) concludes in her study that town-dwellers spend their summer in the Alps because they are looking for a counter-balance to their everyday lives. Physical work gives them psychological recreation, and they escape, driven by a yearning for nature, into what is presumed to be a more unspoilt world (Schmidt-Lauber, 2014). A counterworld of seclusion and simplicity is also increasingly sought after by a wealthy group of customers who purchase an Alpine hut as a weekend refuge 'far from any mobile phone reception

and constant availability' (Zoidl, 2016). The Alps are seen as a place where 'no development in society can affect you', unlike the city with its increasing levels of uncertainty and risk of terrorism (Zoidl, 2016).

The literature review revealed a handful of authors addressing the topic of tourism-related adaptation to the increasing number of heat days and tropical nights caused by climate change in Europe in the summer. The historically very well-established phenomenon of *Sommerfrische* seems to experience some form of revival, re-entering media, and marketing, as well as discussions about tourism. What remains to be done is to produce a vision and definition of what the new *Sommerfrische* of today and tomorrow might be and could look like. These questions were raised in two focus-group discussions, one with residents of the city of Vienna, the other with professionals from the tourism sector.

METHOD

Two semi-guided focus-group discussions with different stakeholder groups (residents of Vienna and tourism experts, partly from *Sommerfrische* regions) were conducted in order to improve understanding of existing perceptions of the term *Sommerfrische* and the actual travel behavior of city-dwellers during heat waves.

Following a number of studies (for instance, Bürki, 2000; Henseling, Hahn, & Nolting, 2006; Littig & Wallace, 1997; Schulz, Mack, & Renn, 2012), focus groups can be defined as discussion groups that are set up on the basis of certain criteria, stimulated by information input to discuss a specific topic while being supervised by a moderator. The method is used for data collection with the aim of addressing as many different aspects of a topic as possible. The discussion process is structured using guidelines so that all the relevant aspects are treated (Henseling et al., 2006; Schulz et al., 2012). The analysis and interpretation of focus groups is based on a literal transcript and follows the analytical steps of a content analysis according to Mayring (2000).

For purposes of the present study, a tentative coding framework was developed on the basis of the focus-group interview guidelines. Its structure was expanded in a process-oriented manner by topics that were mentioned within the focus group. After the framework was finalized, the transcript was encoded a second time to ensure that categories and sub-categories that were added later were applied to the complete text. For each sub-category corresponding quotations and theses were derived that could summarize these quotations in an abstract form and express a distinct idea or argument. Subsequently, each thesis was assigned a core quotation that describes it most appropriately.

The main questions in the guidelines for the interviews with residents included: How do you deal with heat waves comprising heat days and tropical nights? How do you adapt to such situations? How do you usually decide where to go on holiday? What would a *Sommerfrische* destination have to look like to be attractive to you?

The main questions in the guidelines for the interviews with experts included: What are the trends of summer tourism in the Alps? What are the consequences

of climate change for Alpine tourism destinations in summer? What could be the strategies to benefit from the chances of climate change?

RESULTS OF THE FOCUS GROUPS

Below, the final coding schemes for both focus groups are presented, as well as the resulting theses sorted by the categories or codes of the coding framework. The theses represent the leading conclusions of the statements by the focus-group participants for each code.

Results from Focus Group with Residents

The following coding categories were applied to the analysis of the residents' focus-group discussion: dealing with heat (A), influence on travel decisions (B), perception of *Sommerfrische* (C), requirements of *Sommerfrische* destinations (D), mobility and products (E), obstacles to *Sommerfrische* holidays (F), needs and interests (G), and others (H). For the purposes of this chapter, categories C, F, and G are of special interest (cf. Table 1).

The categories and the corresponding theses are presented in Table 2. They help to provide a better understanding of the perception and associations of the term *Sommerfrische*. As the theses show, definitions of the term have changed, and the idea is becoming increasingly important and attractive again. Different holiday concepts are being associated with the term, which is more strongly associated with relaxation and simplicity and less strongly with active sporting holidays. The participants had widely differing ideas about the trip's duration, yet most of them associated *Sommerfrische* locations with a fresh and cool environment, and also with familiar contacts and acquaintances.

Results from Focus Group with Experts

In line with the analysis of the first focus-group discussion, different coding categories have been developed for the analysis of the second focus group, namely Tourism trends (A), obstacles and challenges (B), perception of *Sommerfrische* (C),

Table 1. Coding Scheme for Residents' Focus Group.

Perception of *Sommerfrische*	Obstacles for *Sommerfrische* Holidays	Needs and Interests
C	F	G
C.1: Historic/nostalgic	F.1: Globalization of travel	G.1: Affinity for mountains
C.2: Freshness	F.2: Lack of time	G.2: Closeness to nature
C.3: Childhood experiences		G.3: Townie
C.4: Duration		
C.5: Uncomplicated		
C.6: Potential for revival		
C.7: Recreation		
C.8: Others		

Table 2.   Resulting Theses (Residents' Focus Group).

C	Perception of *Sommerfrische*
Cat	*Thesis*
C.1.1	Some people wish the old *Sommerfrische* back as it used to be originally.
C.1.2	*Sommerfrische* as it used to be will not return.
C.2.1	*Sommerfrische* destinations are associated especially with fresh, cool air.
C.3.1	The image of *Sommerfrische* is strongly determined by local personal relationships.
C.3.2	Older people in particular associate *Sommerfrische* with their own childhood memories.
C.4.1	Understanding of the duration of *Sommerfrische* varies greatly among the respondents.
C.5.1	*Sommerfrische* means proximity and uncomplicated holidays.
C.6.1	A new *Sommerfrische* develops and becomes more attractive, especially for town-dwellers.
C.6.2	For a long time *Sommerfrische* was 'out', but now it is becoming more attractive again.
C.7.1	For some people *Sommerfrische* is associated with relaxation rather than an active holiday.
C.8.2	There are different holiday concepts associated with the term *Sommerfrische*.

F	Obstacles to *Sommerfrische* holidays
Cat	*Thesis*
F.1.1	An interest in international travel and in *Sommerfrische* do not contradict each other.
F.1.2	International and long-distance travel has gained considerable popularity in recent decades.
F.2.1	People would like to spend more holidays in Austria if they had the time.

G	Needs and interests
Cat	*Thesis*
G.1.1	Some summer vacationers are characterized by a special basic affinity with the mountains.
G.2.1	Many summer vacationers enjoy being outside in nature and think of *Sommerfrische* as including learning about nature.
G.3.1	For town-dwellers *Sommerfrische* is a good opportunity to be in nature.

promoting the new *Sommerfrische* (D), mobility and products (E), tourism strategies (F), information for guest surveys (G), and examples of good practice (H). For the purposes of this chapter, categories C, D, and G are examined (cf. Table 3).

The categories and theses that resulted from the discussion with the experts are presented in Table 4. In the experts' view, the associations of *Sommerfrische* are more nuanced, as it is associated with a variety of different activities. In their view, the classic duration of several weeks has been replaced by a pattern of shorter holidays and weekend breaks. The predominant opinion is that the market in this segment is too small and that there will be no satisfactory demand for a new *Sommerfrische*.

Table 3.   Coding Scheme for Experts' Focus Group.

Perception of *Sommerfrische*	Promotion of the New *Sommerfrische*	Information for Guest Survey
C	D	G
C.1: Duration	D.1: New definition	G.1: Attractiveness for short trips
C.2: Market potential	D.2: Advertising	
C.3: Other associations	D.3: Combination with main travel motives	
	D.4: Promoting cool places	

Table 4.   Resulting Theses (Experts' Focus Group).

C	Perception of *Sommerfrische*
Cat	*Thesis*
C.1.1	The classic multi-week *Sommerfrische* is being replaced by short weekend stays.
C.1.2	Originally, the term *Sommerfrische* was associated with a holiday lasting several weeks.
C.2.1	There is insufficient demand for a new kind of *Sommerfrische*.
C.2.2	There is definitely a demand for short stays.
C.2.3	There is definitely a demand for cool places and freshness.
C.3.1	The experts mentioned very different associations of the term *Sommerfrische*.
D	Promoting the new *Sommerfrische*
Cat	*Thesis*
D.1.1	For a new concept of *Sommerfrische*, freshness can be promoted as a counterpart to the heat of the city.
D.1.2	*Sommerfrische* can be a solution for people who suffer from heat in the city.
D.2.1	Advertising for the new *Sommerfrische* should be purposeful and focused on the right timing.
D.2.2	Advertising for the new *Sommerfrische* should be carefully designed.
D.3.1	Establishing the new *Sommerfrische* can succeed if the offer is linked to the most common motives for short trips (cuisine, crafts, culture etc.).
D.3.1	In principle, the new *Sommerfrische* needs an additional travel theme (cuisine, culture, etc.).
D.4.1	Cool places such as waterfalls or gorges are ideal for promoting *Sommerfrische*.
G	Information for guest survey
Cat	*Thesis*
G.1.1	Tourism experts would like to know more about which products and aspects make a short stay attractive for guests.
G.1.2	Innovative but simple concepts can lead to repeated stays in the same region.

Comparison of Results of the Two Focus Groups

The following section compares the main findings of the two focus groups and presents similarities and differences across the different categories.

Heat stress is one topic especially emphasized by the residents. Heat stress represents a real burden for many people according to those in the residents' focus group, and most struggle particularly with the lack of any way of cooling themselves at night. Among the many measures proposed, such as moving leisure activities to cooler places or adjusting daily routines, one suggestion was to spend a few days in places or regions with less heat. Climate change was also mentioned in connection with the increasing number of heat days and the steadily climbing temperatures on summer days, which were increasingly experienced by the residents surveyed in this study.

However, the experts discussed primarily the challenges for tourism providers, which must take into account many different organizational and financial criteria when conceptualizing new tourism products. Personal communication with potential visitors and the advertising of new attractions and activities in particular requires a great degree of flexibility and adaptability. As many tourism offers in Austria depend on weather conditions, the experts viewed *Sommerfrische* offers in different ways. On the one hand, they do not consider tourists flexible

enough to book short-time escapes from hot metropolitan areas spontaneously. On the other hand, they regard the weather conditions as an aspect with potentially negative impacts on travel behavior in case of unexpected or unwanted bad weather conditions. In order to exploit the potential of guests escaping the heat of the cities, tourism providers must come up with new and innovative concepts to be able to establish themselves with an alternative or counter trend to the major tourism providers.

With regard to its specific associations, the experts believed that *Sommerfrische* could be associated with ideas of sustainability and linked to sustainable tourism offers. They also felt that tourists not only expect half-day and day trips when looking for *Sommerfrische*, but could be interested in journeys of several days with a certain number of overnight stays. The residents, however, had very different associations regarding *Sommerfrische*. In particular, older people often linked it to their own childhood memories, as well as to spontaneity and a certain sense of cosiness and closeness.

Differences between the residents and the experts could be observed regarding assessments of the overall potential for future offers of *Sommerfrische* tourism. The residents clearly acknowledged the potential for a new *Sommerfrische*, but they saw no chance of going back to the old (traditional) *Sommerfrische* as it had existed decades ago. The experts had a different view and questioned the overall demand for *Sommerfrische* offers.

DISCUSSION AND CONCLUSION

The findings of the literature review and analysis, together with the focus-groups discussion, allow conclusions to be drawn with regard to the two main aims mentioned in the introduction. The results are relevant first, in recognizing the attributes of *Sommerfrische* at the present time, and secondly, in generating important insights with regard to future research activities.

Attributes of Sommerfrische at the Present Time

Nowadays, the term *Sommerfrische* connotes an increase in the frequency of tourist travel in summer prompted by the desire to escape from the heat to destinations close to the city where the temperature is more pleasant. Heat seems to be one of several factors contributing to the potential revival of a new *Sommerfrische*. Compared to the original term, however, the features attributed to *Sommerfrische* today differ considerably. Nowadays, *Sommerfrische* does not necessarily mean a longer stay in one place, but includes short stays, day trips, and weekend trips. While retreating second homes or going on regular longer stays to a summer holiday resort are closer to the classic *Sommerfrische*, today's *Sommerfrische* excursions and short stays in areas near the city in the summer commonly have as their main motive escaping from the urban heat. The focus-group discussions partly confirm the findings of the literature (Chladek, 2005;

Fleischhacker & Formayer, 2007; Serquet & Rebetez, 2011), which assume that this trend will gain importance with an increase in heat waves due to climate change.

Sommerfrische will nowadays differ from the historical concept in many respects, leading to manifold implications for tourism destinations. The accessibility of many destinations nowadays is a crucial criterion, especially for short-term trips. This may produce various negative impacts on destinations in terms of increasing traffic, the occupation of land by stationary and moving traffic, pollution, etc. Only few promising possibilities exist to replace car use by other more sustainable modes of transport or also to attract those lacking car availability.

Furthermore, short-term booking behavior was also addressed in the literature and by the focus groups. Tourists tend to take weather-dependent travel decisions (e.g., in heat waves) rather spontaneously, which complicates capacity management in the destinations.

Besides, the importance of returning to familiar places decreased – people do not necessarily go to the same place every time, as they did in earlier times. With regard to the target groups, another difference from the original concept can be noticed. *Sommerfrische* is no longer a luxury of the privileged elite, but available to almost all social strata. Nowadays, everything connected to the city is more consciously left behind, although the contrast between city and country is probably not that great anymore. A longing for nature and seclusion supports the trend toward *Sommerfrische*. Finally, the motives are no longer to slow life down, as sports and other activities are much more important than before.

Table 5 includes the differences between the historical and present characteristics of *Sommerfrische*.

Understanding the changes in the characteristics associated with the term *Sommerfrische* is of importance for tourism destinations. They have to be able to adapt and transfer the traditional concept to new motives and expected travel behavior.

Table 5. Historical and Present Characteristics of the Term *'Sommerfrische'*.

	Historical	Present-Day
Duration	Usually several weeks	Often short trips, day trips
Place	Normally always the same place	Varying destinations
Accommodation	Mostly private properties	A wider range: hotels, holiday homes, second homes, etc.
Accessibility	Long travel times	Much shorter travel times
Activities	Mainly relaxation and socializing	Outdoor activities, sports, hiking, biking, etc.
Group	Whole family, including domestic servants	Families, couples, single travellers, etc.
Social strata	Upper middle class, upper class	Almost all social strata
Importance of nature	Bringing the city to the country	Leaving the city behind and enjoying nature
Heat as a motive	Only one among many others	Becomes more important with climate change

Relevance of the Results for Future Research Activities

This study provides insights into the conceptualization of the term *Sommerfrische* and how the term is perceived today. However, it represents only an initial survey based on a qualitative research design. In the following, anchorage points for future research are outlined. The focus groups have produced results that might be interesting for tourism destinations and could be looked at in more detail, especially with regard to their quantitative aspects.

Large differences occur in the perception of characteristics of *'Sommerfrische'* offers (short / long, nostalgic / modern, active / passive). This understanding could be probed further using a quantitative approach in representative areas. Regarding the tourism product, the residents' focus group specified only a few requirements regarding infrastructure and leisure activities. They showed great interest in leisure activities, which included active learning (courses, workshops, sports offers). It could be of interest to analyze both needs and expectations in greater detail against a larger sample. When looking at the origins of potential target groups, the location of residential areas (being close to the center in comparison to less densely populated areas) could have an influence on the effects of heat and could therefore also be taken into account as an influencing factor in future research.

The two focus groups showed strongly divergent opinions about the best ways for tourism destinations to communicate and the distribution of offers, in particular with regard to prefabricated travel packages. The desire for standardized offers versus individually tailored ones could be addressed in future research in light of the potential for a *Sommerfrische* niche in tourism. An additional aspect with regard to communication was the availability of information on the internet, a major issue that was often raised in the discussions. Both the availability of online-booking and the quality of the online presentation of the tourism offers of near-metropolitan mountainous areas, which are likely to be demanded more by *Sommerfrische* seekers in the future, seem to have a lot of potential for optimization. In particular, those destinations with low tourism activities so far and modest levels of available accommodation could investigate their potential to strengthen their visibility online and address potential *Sommerfrische* tourists through new marketing channels. The citizens involved in the focus groups had the feeling that the relevant information is not as yet being sufficiently prepared and presented for them to be able to filter it according to their personal interests. The increasing relevance of the internet and social media as sources of information is confirmed by various tourism studies and tourism monitoring, such as the Tourism Monitoring Switzerland Summer Report (Schweiz Tourismus, 2013) or T-MONA (Österreich Werbung, 2014). With regard to short-term escapes from heat waves in the city, facilitating spontaneous booking could be an interesting topic to survey in light of the new *Sommerfrische*. Overall, the potential for short trips from metropolitan areas in summer and the need to market these options more strongly were core results of this study, which could be tested further by applying quantitative research approaches. For the destinations, not only general visiting intentions are interesting, but also the desired components of *Sommerfrische* travel.

Furthermore, influencing factors could be examined by means of a larger quantitative survey: the residents' focus group confirmed that the ideas and desires, including place of residence, of friends or family are highly decisive in choosing a tourist destination. Accordingly, it would be interesting to analyze the impact of positively formulated social norms in the context of *Sommerfrische* tourism. Additionally, television and advertising have been mentioned as inspirational sources of decisions regarding holidays. The roles of advertising and the media seem to be other important factors influencing travel behavior, ones that have not yet been examined for *Sommerfrische* destinations specifically. In particular, the influence of weather forecasts in combination with advertising could be an interesting topic to survey.

A more in-depth analysis of these issues will help provide a better understanding of the perception, expectations, and travel behavior of (potential) summer guests seeking *Sommerfrische*, as well as a better estimate of the potential for new *Sommerfrische* products in general. Both the literature review and the results of the focus-group discussions indicate future potential for a *Sommerfrische* revival. This chapter provides initial insights into this topic and the associated preferences and characteristics, but further research and evidence-based results along the following questions are needed: Is urban heat considered a burden by residents? To what extent is *Sommerfrische* travel considered a potential measure of adaptation? Which social and psychological aspects are strong determinants of one's future intention to visit *Sommerfrische* regions? Which visitor segments can be identified, and what are their preferences and behaviors?

Drawing on the results of this chapter, apparently such travel decisions are largely influenced by attitudes, the social environment, and other social or psychological factors. Therefore, it seems beneficial to base future research on an attitude-behavior theory in order to gain greater insights into the *Sommerfrische* phenomenon.

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DISCLOSURE

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Paper

Author's contribution:

The thesis author was the main contributor. Her roles included the co-development of the paper concept, the analysis of data as well as the write-up of the methodology, the results and the mobility-related parts of the literature and the discussion.

AJP was the second leading contributor. She was also actively involved in the conception of the paper as well as the write-up of the tourism-related parts of the literature and the discussion. All other authors commented on the manuscript and helped with the interpretation of results.

Out of the City Heat—Way to Less or More Sustainable Futures?

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Abstract: Rural alpine areas are affected by climate change in multiple ways. Today, many lower regions already face challenges in winter. However, several authors indicated new potentials for near-metropolitan areas in summer. As the first study for a metropolitan area, this paper discusses results of a large-scale quantitative survey ($n = 877$) from Vienna (Austria) to evaluate the intentions of urban residents to seek refreshment in nearby mountainous regions. The results regarding their adaptation behavior confirm the likely increase in demand to escape to nearby refreshing areas during heatwaves. This trend could lead to (re-)vitalization potential for rural near-metropolitan areas in Eastern Austria, which are often characterized by depopulation and degradation of infrastructure. A closer look at the respondents' mobility behavior, reveals a high risk for unsustainable developments. Although the high and increasing share of car-free households in Vienna would suggest a strong demand for public transport, the likelihood to travel by car towards such destinations is high even among this group. Focusing predominantly on on-site mobility offers would be recommended since many travelers did not use their car within the destination. At last, the attractiveness of climate-friendly travel options is discussed considering mobility-related needs and preferences of three touristic motive groups.

Keywords: summer tourism; climate change adaptation; urban heat; tourism mobility; sustainable tourism; Sommerfrische; Austria; rural destinations

1. Introduction

Rural areas, especially in alpine territories, are affected by climate change in multiple ways. In Austria, the socio-economic impacts of climate change have been assessed for several sectors [1]. One of these sectors with strong importance for remote areas is tourism. Climate and related changes in weather conditions affect tourism behavior in many ways [2–8].

In winter, lower regions especially, as it is the case in several near-metropolitan destinations in Eastern Austria, are facing challenges due to a decreasing reliability of snow conditions [9,10]. Various authors (see for example, [3,11–14]) have assumed that, on the other hand, an increase in hot

summers and heatwaves could also lead to an increasing demand from inhabitants of large cities seeking refreshment in near-metropolitan rural destinations during summer time. In this context, the German-speaking literature addresses a revival of the "Sommerfrische" [15,16]. "Sommerfrische", a term from the 19th century, is used to describe the aestival emigration of urban residents towards rural near-metropolitan mountainous destinations characterized by picturesque sceneries and refreshing climate. The term referred both to the type of vacation as well as the locations itself. According to these authors, rural mountain destinations located close to large agglomerations might become more attractive for tourists in the summer time to relax and refresh away from the urban heat for both short-term trips and longer stays [17]. In several of these areas, tourism and the improvement in infrastructure, in particular public traffic, linked to it, is regarded a major strategy against depopulation, brain drain and ageing of the population [18]. Consequently, knowing about their own adaptive capacities in response to the negative impacts of climate change is essential for these regions.

Whereas the adaptive behavior to climate change in winter has been surveyed in various studies in the past decade [19–25], the changing demand in summer has been scarcely examined [9,17]. No empirical study has so far studied this aspect based on a quantitative survey of a large metropolitan area and its surrounding destinations.

While tourism is affected by climate change, the sector itself also holds a key role in fostering climate change in many different areas [8,26–29]. Compared to other activities in the delivery and consumption of a tourism product (accommodation, gastronomy etc.), the means of transportation in use has a strong direct impact on the carbon footprint of the tourists [27,30,31] and an indirect impact on the carbon footprint of the respective destination [28]. In line with this, the Austrian Tourism Strategy has explicitly identified the need to prioritize climate-friendly travel options in order to mitigate climate change [26]. In more rural, loosely populated areas, the commonly-promoted implementation of better public transport schemes often seems very cost and energy-ineffective. It, therefore, does not always constitute a viable solution to the problem, requiring research to identify and develop alternative solutions.

Regarding the potentially increasing number of short-trips from urban areas to close-by near-metropolitan refreshing destinations, maladaptation could occur when envisaging a stronger multi-seasonal visitor distribution without offering and promoting sustainable climate-friendly transport options. Consequently, it seems advisable to not only investigate the characteristics of future guests (motives, needs, booking behavior etc.) but also at their travel behavior as well as influential factors to increase the acceptance of climate-friendly, sustainable transport modes.

This paper will use a large-scale quantitative survey (n = 877) from Vienna to evaluate the intentions of urban residents to seek for refreshment in nearby mountainous regions as well as to investigate the intended travel behavior and acceptance of sustainable transport modes.

Against this background of challenges for sustainable development in near-metropolitan areas, with tourism as an important source of income, the research aims of this paper are:

- To identify how metropolitan residents, adapt to the increasing number of heat days and tropical nights within the urban agglomeration with respect to their booking and travel behavior, particularly investigating the role of destinations in the nearby mountainous regions.
- To consider current visitor motives and planned activities (at the destination) and to investigate the visitor segments' specific destination selection criteria and their transport and mobility patterns.
- To derive recommendations for sustainable, climate-friendly and resilient destination management in near-metropolitan areas to help develop a tourism portfolio that responds to tourists' attitudes in a sustainable way.

2. Background

2.1. The Influence of Climate Change Adaptation on Alpine Destinations

Several researchers point out the effects of climate change on tourism in manifold ways, both in Austria and beyond. Especially in alpine areas, climate change has manifold effects on the tourism sector, mainly because of the current temperature rise which is expected to increase further in the future. Due to its reliance on natural resources as a key asset, the sector of rural nature-based tourism is partly vulnerable to the effects of climate change [1,9,32]. Steininger et al. [1] point out the monetary effects for Austrian tourism including rural nature based activities.

Whereas in winter, these regions are facing challenges due to a decreasing reliability of snow conditions [10,17,33,34], there are new opportunities expected in summer due to multiple aspects. In addition to pushing factors, such as heat stress in large metropolitan areas, pulling factors, such as higher water temperatures in lakes and other surface water bodies as well as ameliorated weather conditions for sportive activities are highlighted [35,36]. Additionally, a shift from Mediterranean destinations to alpine areas has been discussed over the past years, which could be induced by risks of heatwaves, water scarcity and forest fires in some Mediterranean areas as well as political instabilities [37–39].

The adaptation behavior of citizens of metropolitan areas (such as Vienna) to heatwaves as a push factor, and the potential for a revival of the former "Sommerfrische" linked to it, is under-researched so far. "Sommerfrische" formerly implied a longer stay at refreshing rural areas for recreation, social and cultural purposes. Today, this concept comprises both day-trips for leisure activities as well as holidays with various motives [40,41]. Only Babcicky and Seebauer [42] analyzed the adaptation behavior of citizens—yet only for small to medium-size metropolitan areas in Styria, a Southern Austrian region. Due to the different adaptation potentials in the metropolitan areas, small- to medium- and large-scale metropolitan areas are limited in their comparability.

2.2. The Importance of Adaptation for Rural Development in Remote Areas

Köberl et al. [43] argue—based on the extensive study COIN—that the tourism sector will face losses up to 210 Million Euros per year between 2036 and 2065 when not putting adaptation measures in place. When aiming to maintain their economic capacity, rural tourism destinations could address new tourism segments, requiring them to adapt their tourism portfolio. In this context, the results of other studies [44,45] indicate a diversification of tourism strategies in particular with regard to seasonality and offers/new target groups as a major adaptation strategy to cope with climate change. Therefore, a closer look at the likely development of demand for near-metropolitan summer tourism can be particularly important for those rural areas with structural weakness, as is the case in some areas around Vienna.

2.3. The Travel Behavior of Metropolitan Citizens and Its Impact on Sustainable Regional Development

Available transport options influence the sustainable development of rural areas in two ways: First, socio-economically by providing access to education, health care and workplace and second, environmentally by decreasing CO_2 and particular-matter emissions that affect the global climate. Overall, transport contributes to about 25% of European greenhouse-gas emissions [46]. Tourism mobility has a strong part in this negative effect. However, in particular large metropolitan areas show an increasing trend towards car-free households [47–50]. In Vienna, many households (about 45%) without access to a private car depend primarily on public travel or short-term rental options [51]. Rural tourism areas tend to be characterized by a low accessibility by public transport and high car dependence among both residents and tourists [52]. The connection between on-site activities and the travel options to the destination could significantly influence the travel choice of this group. Consequently, reflecting tourists' mobility behavior and resulting transport demands seems

increasingly necessary in the context of (more) spontaneous travels outside of the city as a means to adapt to persisting heatwaves.

In this context, it is important to differentiate between the needs of winter and summer tourists. In their study of domestic and foreign tourists travelling to mountain destinations in Austria, Bursa and Mailer [53] found substantial differences between summer and winter travels with regards the aspects impeding them from using public transport to reach their destination. While in summer, uncertainties regarding their mobility needs at the destination itself were the greatest cause of concern, the majority of winter tourists in Austria perceives the question of luggage transport as the most critical issue.

Strong differences can also be observed between arrival and on-site mobility. The FUR travel analysis [4] was the first study to collect data specifically on German tourists' use of transport means at holiday destinations (major holiday trips were defined as trips of more than five days in the year 2014). This study observed that public transport played a much greater role in on-site mobility than for arrival and departure journeys. Moreover, a wider variety of modes of transport were used at the holiday destination. These results further resonate with the study conducted by Bengsch et al. [54] according to which many guests at rural tourist regions in Germany expressed a high interest in the use of public transport for both arrival and departure journeys, as well as on-site mobility. While around 40% of the day and overnight guests stated that they tried to travel by bus or railway towards their destination, the willingness to use local public transport at the holiday destination was at over 50%. Travelers, hereby, levelled high expectations at transport offers relating to prices or the price/performance ratio. Moreover, the choice of a particular transport mode for the outward journey was shown to be greatly influenced by the local availability of comprehensive and customer-friendly on-site transport options [55].

These results are confirmed by a recent publication from Bursa and Mailer [53] for Austrian destinations. It also suggests that the car is often chosen as a transport mode to guarantee the highest degree of flexibility at the holiday destination. Compared to the outward journey, the study revealed that privately owned cars play a significantly less important role at the holiday destination itself. In addition, the number of transport modes named in the study indicates that on-site mobility is more diverse and likely more context-specific than transport modes used for arrival.

3. Materials and Methods

3.1. Study Design

This investigation, carried out between July 2016 and November 2018, followed a three-step approach. In doing so, it intends to analyze the factors influencing sustainable adaptation to climate change at both the demand and supply side as well as the crucial factors to foster climate-friendly tourism mobility. The three steps of the multi-modal approach are as follows:

1. Qualitative Pre-Research Focus Groups: Exploration of relevant topics and questions in order to inspire the project research framework and, especially, to elaborate the quantitative survey.
2. Quantitative Surveys: Analysis of the source market (demand side) regarding tourists travel behavior, adaptation intentions and capacities (potential), and needs for transport services.
3. Qualitative Future Workshops: Analysis of the case study destination (supply side) through participatory research designs: Development of strategies for adaptation to changes in demand as well as strategies for the mitigation of potential climate change threats arising from the expected increase in travel demands as well as energy and resource needs.

This publication discusses primarily the results of the large-scale quantitative survey and subsequently reflects on it in relation to the qualitative results of the future workshops. Previous results on the pre-survey stage (including the telephonic pre-screening and the analysis of the focus groups) that fed into the overall survey development are summarized in Juschten et al. [56]. The map underneath (Figure 1) shows the study context consisting of Vienna and the two case study regions.
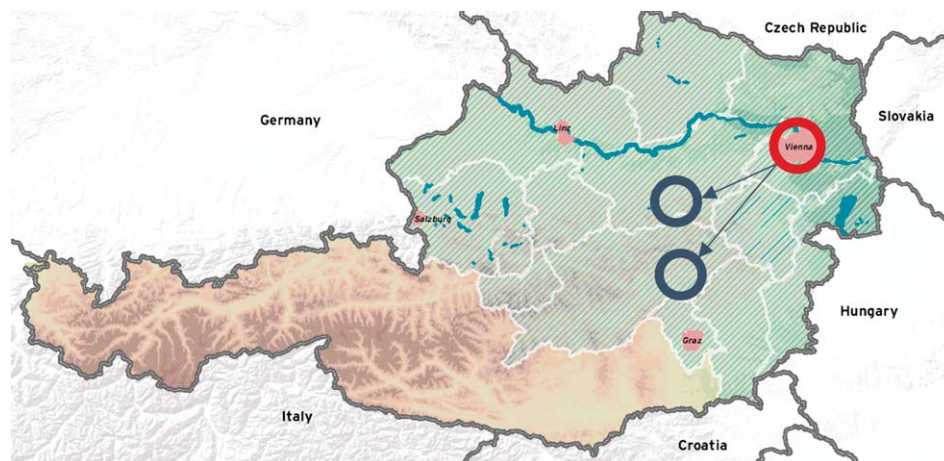
Figure 1. Map of "Sommerfrische" destinations in Austria (green diagonal lines), showing the source market Vienna (red circle) and the two case study regions (grey circles).

3.2. Content of the Survey

In order to gain insight on the different aspects of the research questions—such as the effect of heat on tourism choices as well as different potential target groups for "Sommerfrische" destinations—the survey consisted of different thematic sections. They are as follows:

1. Perceptions of climate change in Vienna, the residential situation and the heat stress perceived during the heat summer 2015 (Note: 2015 was the second hottest summer in Vienna since the measurements started in 1767 [57], turning into a relatable reference point for heat summers which many Viennese citizens still vividly remember).
2. Use of different adaptation options in response to heatwaves.
3. The intention to visit "Sommerfrische" destinations including factors influencing this intention such as attitudes, subjective norms and easiness to plan "Sommerfrische" trips among others.
4. Attributes of a past "Sommerfrische" trip including duration, location, travel motives, used modes of transport, accommodation, and booking behavior.
5. The desired attributes of "Sommerfrische" destinations and the preferences regarding accessibility and transport services.
6. General socio-demographic and psychographic attributes

3.3. Description of the Sample

The survey took place online between June and July 2017, addressing citizens of Vienna aged 14 to 69 years. The age restriction was predetermined by the pool of participants in the online-access panel provider who recruited the respondents. They contacted the panel members with a short email containing the broad topic "Travelling" and a personalized link to the survey. The completion rate of those starting the survey was 80.6% with an average completion time of 20.4 min. The final sample encompassed 877 respondents.

Due to the chosen recruitment method, it was possible to set response quota, thereby allowing for a representative (Viennese) distribution regarding age and gender. No stratification according to education, occupation, income or spatial characteristics took place. All reference values for Vienna are derived from publications based on the micro-census of "Statistik Austria" for 2015 [58–60]. Based on this data we observed a slight over-representation of highly educated people in the sample, which is partly because the Viennese education statistics also contain people above 69, who tend to have a lower level of education. Regarding the current occupation, we observed a slight over-representation of retired people and those still completing their education. The Viennese population statistics were truncated to the age groups represented in the sample (14 to 69 years). This explains the higher

proportion of unemployed and the lower proportion of retired people in Vienna. Table 1 illustrates the sociodemographic attributes.

Table 1. Sociodemographic attributes of sample and Viennese population.

	Survey Sample (1)	Viennese Population (2)	Deviation (1) and (2)
Average age in years	41.7	40.4	1.3
Gender			
Female	51.3%	51.3%	0%
Male	48.7%	48.7%	0%
Highest education			
No or a primary school diploma	7.2%	27.7%	20.5%
Apprenticeship diploma	32.8%	36.2%	3.4%
High school diploma	30.1%	19.1%	11.0%
Higher education/University degree	29.9%	17.0%	12.9%
Occupation			
Employed	62.1%	60.5%	1.6%
Unemployed	6.2%	9.3%	3.1%
Retired	15.2%	9.5%	5.7%
In education	12.3%	7.0%	5.3%
Other (staying at home etc.)	4.2%	13.7%	9.5%
Household Types			
Adult households, no children	73.4%	70.2%	3.2%
All children between 6 and 17 years	14.8%	17.0%	2.2%
At least one child younger than 6	11.8%	12.8%	1.0%

3.4. Data Analysis

After cleaning and preparing the data for further analysis, a first descriptive analysis took place comprising the distribution, means, and standard deviations of all variables. After reviewing these results, an explorative analysis of all bivariate correlations was conducted in order to gain first insights into the covariance structure and relationships between sociodemographic and attitudinal variables with the intention to escape the heat. Furthermore, cross-classified tables were made to show differences between groups such as heat-stressed respondents and those who are not, as well as car-free vs. car-owning households.

As a prerequisite for several statistical tests, the normality for all relevant variables was tested. Within the variables included in the model, skewness ranges from −1.314 to 1.463 and kurtosis ranges from −1.984 to 2.174, illustrating good normality according to the limits indicated by Kline [61]. He suggested skewness to be between −2 and +2 and kurtosis between −3 and +3.

Afterwards, those variables possibly relevant for the segmentation analysis (such as travel motives in general and specifically towards "Sommerfrische" destinations as well as media used for information and booking purposes) entered an explorative principal component analysis (PCA) in SPSS (using Varimax rotation). The aim was to explore meaningful constructs in the dataset on underlying motive structures or travel patterns. The internal reliability of the constructs was tested using Cronbach's α. Section 4.4 of this paper presents the results.

In order to depict different, possibly rather homogenous, target groups for "Sommerfrische" travels and identify their individual characteristics, a segmentation was performed. Following the literature on tourism segmentation, different strategies and segmentation criteria can be used. As explained by Dolnicar [62], such segments can either be defined a-priori ("profiling" before the actual analysis through "common sense", experience or based on theory) or a-posteriori (data-driven, explorative). Criteria for this segmentation are usually either sociodemographic, behavioral (i.e., motives, booking behavior) or psychographic variables (i.e., attitudes/norms). Pesonen and Tuohino [63] provide an overview of segmentation criteria applied specifically in the context of rural well-being tourism, ranging from travel motives to expenditures or travel search behavior. Within this study, both a-posteriori and a-priori approaches were explored to find meaningful customer segments. The performed cluster analyses based on sociodemographic variables could not reveal

any meaningful segments. Based on other literature, sociodemographics seem to lose their relevance as determinants of different motivation or activity-based tourism segments (see [64,65]). Therefore, a segmentation based on behavioral variables such as travel motives appeared more fruitful.

To do this, we followed the four-step approach of a-priori segmentation as illustrated by Dolnicar [62]. First, the selection criterion was chosen, which in this case were the factors created based on the general travel motives of all respondents. Second, the respondents were assigned to four different groups based on the factor score of the PCA. Respondents were assigned to the factor group for which they had the highest positive factor score; respondents with negative scores on all three factors were assigned to group 4. Third, the segments were described in terms of their sociodemographic, behavioral and attitudinal profile. This was done using a mean value comparison using *p*-values as a measurement for statistical significance. This step was only done for the first three groups since the fourth is characterized by the non-compliance with any of the given motives. In a fourth step, the usefulness of these segments for tourism planning was discussed.

3.5. Future Workshops

Through transdisciplinary future workshops, the outcomes of the research on the demand side were reflected and extended by the perspectives of the actors of the supply side. The study was elaborated together with stakeholders from two near-metropolitan tourism regions, as these areas are well suited to representing the structural situation of mountain destinations located close to Vienna. Both regions suffer from depopulation, especially among the younger population. However, existing railway connections and the proximity to nearby medium-size cities provide opportunities for residents of these regions. Tourism has a long tradition in parts of the two areas, but it was not developed further over the years. Both regions lack strategic development concepts and only recently, activities started to target sustainable, long-term development of the areas.

The main purpose of the future workshops was to strengthen and support the development and climate change adaptation processes in rural areas close to agglomeration by analyzing the challenges and potentials of the regions. At the same time, the prevention of maladaptation and development of recommendations for sustainable destination management were key issues.

Three half-day workshops were designed as a future workshop, where participants were encouraged to develop new and creative solutions to issues of current interest related to tourism development in their region. Around 15 participants from communities, destination management organizations, managers of tourism infrastructure and transport providers joined each workshop in the case study areas. Together with the research team, they underwent three phases (criticism phase, fantasy phase, realization phase) according to the method of future workshops [66].

One of the main challenges in trans-disciplinary work with stakeholders was finding effective ways to translate and transfer research results to the stakeholders, in order to make them usable and useful for them when developing sustainable strategies for the future of the tourism region. Thus, when designing and carrying out the workshops a focus was on how to communicate the scientific results in order to meet their everyday reality, language, interests, needs etc.

The results of the future workshops were documented by photographs and protocols. A comparison between the two regions allowed identifying challenges both regions have in common and compare approaches to overcome these challenges. Before the comparison, the results were analyzed according to the three phases as well as sub-division per categories of regional development. Particular focus was set on the two main aspects—the role of sustainable tourism development as well as climate-friendly mobility.

3.6. Limitations

As illustrated above, the segmentation of tourists along socio-demographic and economic variables has become increasingly difficult [64,65]. The same occurred throughout this study, therefore an a-priori segmentation based on motive groups (core travel motives) turned out to be the best

approach. The fact that sociodemographic factors have lost their explanatory power in tourism segmentation also shows in these motive groups; they can mainly be explained by subjective or attitudinal aspects. Therefore, their transferability on a larger tourism population is limited. Yet, for the specific regional context that is studied here, they provide very valuable information.

Whereas the Swiss Tourism Monitoring includes only people from 16 years onwards, the Austrian Tourism Board already surveys 14-year olds about their travel behavior [67]. This study includes respondents from the age of 14 to be in line with the official tourism monitoring in Austria. We are aware that including young people below 16 might entail certain limitations regarding the validity of their response to household details etc. Depending on the exact question of the survey, it might be necessary to be more cautious when choosing the respondents' age group because teenagers are often not involved in certain types of household decision-making (i.e., travel budget) possibly requested in surveys (budget aspects are not included in this study though). Therefore, their responses might be less reliable than desired. Since the dataset of this study includes only three people younger than 16, their impact on the results is marginal even within the youngest age-group. Besides the age distribution, we are also aware that these data only cover one respondent per household. Therefore, it was not possible to differentiate between different household members in terms of leisure activities and tourism motives. To account for this, we have taken the individual level as the reference point for the analysis and not the household level.

The degree to which people perceive heat as stressful was based on their memory of the heat of summer, 2015. This way of retrospective question design comes with a few shortfalls: People tend to remember pleasant events stronger than unpleasant ones, therefore possibly underestimating their own past heat stress [68]. Furthermore, their memory might generally be flawed, depending on the quality of people's memory and the degree to which memories might have been altered a-posteriori based on other people's stories or perceptions. To ensure that people refer their perceptions to the same event, Tourangeau et al. [68] suggest to give people cues that are distinctive to the aspired reference point. Since 2015 had a strong medial and societal presence for being one of the hottest summers in the Viennese history, it is presumably particularly memorable and therefore a good reference point fur such a retrospective question.

4. Results

The following section illustrates the response of urban residents to the experience of heat stress and what they are looking for in near-metropolitan destinations. Next to the adaptation behavior and key motives related to escaping the heat of the city, the final sub-section describes the mobility behavior and preferences as well as attitudes towards climate-friendly transport options.

4.1. Heat Stress Experienced by Urban Dwellers and Its Possible Impact on Travel Behavior

A major part of the survey concerned the perception of heat stress among urban dwellers, as well as their strategies of heat adaptation. As to examine to what extent heat is experienced as a strain, respondents were specifically asked about their memories of the "heatwave summer" of 2015, during which Vienna registered a record-breaking number of heat days.

As shown in Figure 2, almost half of the respondents stated that they had experienced the summer of 2015 as stressful—either generally (46%) or particularly at night (45%). Merely 24% of the surveyed Viennese residents were pleased with the heat and remember the summer months of 2015 positively. The remainder did not remember the summer as particularly noteworthy or did not spend it in Vienna. Thus, around two thirds (64%) of all respondents perceived the heat either partially or under certain circumstances as a strain, while one third perceived it either in a positive or a neutral way.
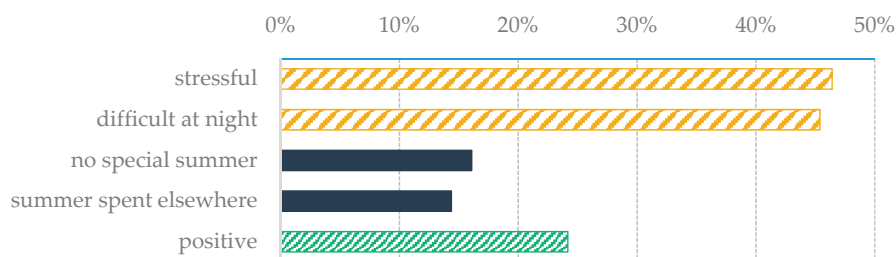
Figure 2. Experience of the heatwave summer 2015 in Vienna, *n* = 1284 of 877 respondents, multiple answers are possible.

Along with the analysis of frequencies, the responses to further questions were interlinked with these data on respondents' experience of heat stress. To that end, respondents were divided into two groups: Those stressed by the heat (yellow bars in Figure 2, *n* = 557) and those unaffected or pleased by the heat (green and blue bars in Figure 2, *n* = 320). In terms of socio-demographic characteristics (age, gender, household size, district etc.), the data surprisingly shows no significant differences between the two groups. This contradicts several other studies that find a strong interrelation between heat stress and social status [69]. At least within this sample in the Viennese context, this cannot be confirmed.

Regarding the apartment temperatures (see Figure 3), around half of respondents found the temperatures in their apartments or houses to be tolerable. A total of 37% of the surveyed inhabitants felt that temperatures in their homes were too high, while 15% indicated that they were comfortably cool. The data also illustrate that those people stressed by the heat also tend to either have higher room temperatures at home or at least perceive them as less bearable.
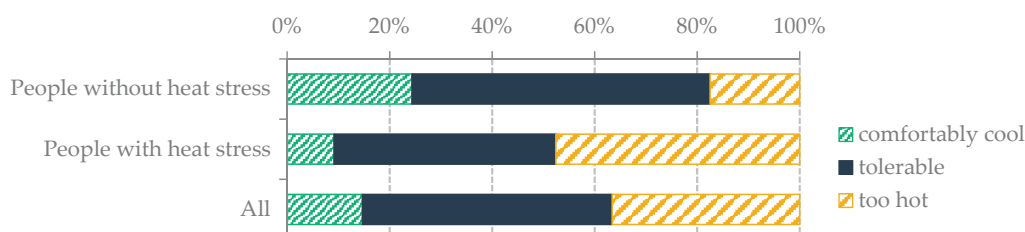
Figure 3. Experience of heat-stress in private housing areas of Viennese citizens, *n* = 877, *p* < 0.01.

4.2. Adaptation to Heat Stress

In terms of leisure activities during heatwaves, over 80% of respondents stated that they sought out ways to cool down. However, the responses in this regard revealed two opposing strategies, both used at the same rate: "Escaping" to the outdoors (to go swimming, seek out parks or other cooler spaces) or remaining indoors (i.e., staying at home).

When asked about the leisure activities that people do more frequently in times of heatwaves, the data show that heat-stressed people often choose between two rather distinct adaptation strategies: A passive or an active approach. They either stay at home to avoid the heat altogether or they go outside and actively look for refreshing spots inside and outside of the city. In contrast, almost 30% of the people unaffected by the heat declared that their choice of leisure activities was not affected by the heat and that high temperatures had no impact on their recreational habits. Those who did change their behavior, however, mainly chose active adaptation modes by going swimming more often or visiting other refreshing spots. Figure 4 visualizes these different strategies.
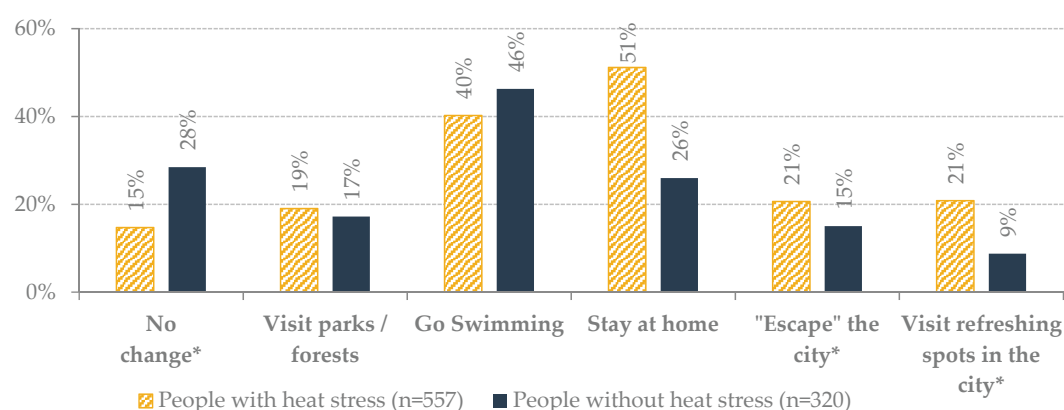
Figure 4. Adaptation strategies of Viennese citizens to heatwaves, *n* = 1381 of 877 respondents, * indicates significant results with *p* < 0.01.

These two diverging adaptation strategies concerning recreational preferences are also reflected in the respondents' travel behavior. Thus, people who adapted to heatwaves by retreating into the comfort of their own home were generally shown to travel less frequently outside of the city to refresh. This observation is somewhat striking, as people following a "passive" adaptation strategy might be expected to display a more urgent desire to escape from the city. A possible explanatory factor can be found in the groups' age distribution. Those who preferred to spend their leisure time in cooling outdoor spaces were more often aged between 14 and 29, while people who favored staying at home were more often above 49 years of age.

4.3. The Impact of Heat on Travel Motives and Behavior

Overall, 46% of respondents who had already experienced some form of heat stress selected "escaping the heat" as a travel motive in general or specifically for "Sommerfrische" trips (only 23% of those unaffected by the heat considered it to be a motive to travel). Specifically, for "Sommerfrische" trips, 95% indicated that "escaping the heat" was only one out of several motives which influenced their destination choice in favor of a "Sommerfrische" trip. The motives most often cited in addition to "escaping the heat" were "recreation" (76%), "to be surrounded by nature" (76%), and "to replenish mind and soul" (68%).

Concerning the extent to which travel behavior has already been altered because of previous heatwaves, over 70% of those "unaffected by the heat" and 65% of those "stressed by the heat" stated that they have not yet changed their travel habits. Among the "heat-stressed" respondents, a larger percentage indicated that they had already made some changes in their travel behavior, whereby time frames and activities were both modified to the same degree, while holiday destinations were changed less frequently.

While most people have not yet changed their travel behaviors in response to urban heat, the findings of this study suggest that the demand for near-metropolitan rural tourism destinations will increase in the future, in case that heatwaves become more frequent [70]. According to this study, the strongest drivers of such a future demand are the current intention to visit such destinations and the degree of personal heat stress.

4.4. Main Motives for "Refreshing" Trips in Near-Urban Destinations

"Escaping the heat" was often cited in combination with a range of other motives to go on summer trips to refreshing, near-metropolitan destinations. Consequently, it was important to understand what exactly these motives entailed. Furthermore, knowledge about travel motives can be helpful to identify approaches of climate-friendly, sustainable tourism mobility. As illustrated before, a principal component analysis was used to identify meaningful structures in the data. The analysis revealed that the general tourism motives are most promising for identifying customer segments. The subsequent Table 2 shows the construct that the variables create and provides information on their internal reliability using Cronbach's alpha.

Table 2. Results of principal component analysis and internal reliability of factors. Scores only shown when above 0.45.

Variables	Factor 1	Factor 2	Factor 3
Cronbach's alpha	0.721	0.587	0.504
Doing sports/being active	0.825		
Doing sth. good for own health	0.789		
Learning something new	0.622		
Being in nature	0.545		
Undertaking cultural activities		0.719	
Experiencing sth. exceptional		0.686	
Meeting new people		0.599	
Experiencing culinary joys		0.594	
Relaxing			0.772
Doing sth. good for own soul			0.743
Escaping the city			0.492

The dataset allowed for the identification of four groups categorized based on their key travel motives. Their characteristics are described subsequently and in Table 3:

- Group 1: Sports and outdoor-oriented travelers (highest on factor 1)
- Group 2: "Manifold experiences" -oriented travelers (highest on factor 2)
- Group 3: "Relaxation close to nature"-oriented travelers (highest on factor 3)

From the point of view of the tourist sector, the most interesting groups are those looking for "manifold experiences" and those wanting to be "physically active" during their trips, as they exhibit particularly distinctive travel behaviors. Respondents in these groups visited places identified in the project as refreshing "Sommerfrische" destinations on average between five and seven times a year. Particularly the "sports and outdoor" group displayed an above average intention to make further trips to refreshing destinations in the future (between six and eight times a year). A look at each group's economic impact, however, reveals that their attractiveness as potential target groups for a destination varies. While the groups looking for "manifold experiences" and to be "sports and outdoor" frequently sought out family-friendly accommodations (holiday apartments, guest houses and lodges) in the lower quality and price range (one- to three-star establishment in the hotel business), the group interested in "recreation close to nature" stayed at four- and five-star establishments in near-metropolitan refreshing destinations. Further characteristics of these motive-related groupings are detailed in Table 3 below.

Table 3. Core travel motive groups and their "Sommerfrische" preferences.

Variables	Total Sample	Group 1 Outdoor (*n* = 260)	Group 2 Experience (*n* = 248)	Group 3 Relaxation (*n* = 304)
Indicator	mean	mean	mean	mean
Age **	41.7	43.2	38.7	43.0
Gender				
Female **	51.3%	50.8%	47.2%	57.6%
Male **	48.7%	49.2%	52.8%	42.4%
Heat perception and adaptation				
Heat—burdensome	63.5%	61.5%	64.9%	64.5%
Heat—positive	24.2%	25.8%	27.4%	21.1%
Adaptation—escaping the city	18.6%	16.9%	17.7%	14.5%
Adaptation—staying at home *	42.0%	36.5%	42.3%	44.1%
"Sommerfrische" trip duration				
Day trips	27.7%	28.0%	27.8%	25.9%
Short getaway (1 to 4 days)	53.0%	50.7%	56.1%	51.9%
Long holiday (5 or more days) *	19.3%	21.3%	16.0%	22.2%
"Sommerfrische" travel motives				
Doing sports/being active **	25.5%	45.5%	17.1%	17.2%
Doing sth. good for own health **	26.5%	38.4%	17.6%	25.9%
Learning something new **	3.4%	4.7%	5.3%	1.3%
Being in nature **	57.3%	63.0%	50.8%	60.7%
Undertaking cultural activities **	11.0%	12.8%	18.2%	5.0%
Experiencing sth. Exceptional **	14.4%	13.3%	20.9%	11.3%
Meeting new people **	7.5%	6.6%	12.8%	4.6%
Experiencing culinary joys **	22.8%	14.7%	27.8%	26.4%
Relaxing **	57.3%	53.1%	51.9%	66.5%
Doing sth. good for own soul **	52.3%	47.9%	46.5%	62.8%
Escaping the city **	49.0%	51.2%	46.0%	52.7%
Booking preferences				
Travel agency	2.4%	2.4%	3.2%	2.1%
Directly at accommodation	44.2%	46.0%	38.5%	47.3%
Internet portal/website **	20.3%	23.2%	26.7%	14.2%
Tourism office	3.4%	4.3%	3.7%	1.7%
Spontaneously at destination	28.6%	27.5%	27.8%	29.3%
Fellow travelers				
Alone	7.5%	7.1%	6.4%	8.8%
Friends **	28.7%	27.5%	38.0%	23.0%
Partner **	59.4%	61.1%	50.3%	65.3%
Children *	20.6%	22.7%	14.4%	23.8%
Family/Acquaintance *	18.1%	19.4%	22.5%	15.1%
Unknown people/travel groups	2.1%	3.3%	1.1%	1.7%
"Sommerfrische" accommodation				
4–5 star hotels **	25.1%	23.0%	17.8%	32.2%
1–3 star hotels	14.5%	17.8%	14.1%	12.4%
Holiday flat	16.1%	16.4%	21.5%	12.4%
Guesthouse	24.2%	28.9%	25.9%	19.2%
Holiday farms	6.5%	9.9%	4.4%	5.1%
Alpine huts	4.1%	4.6%	4.4%	3.4%
Youth hostel	2.9%	3.9%	2.2%	2.8%
Camping	4.9%	4.6%	7.4%	4.5%
Private accommodation *	18.1%	15.1%	25.2%	2.8%
Secondary residence	3.5%	3.3%	1.5%	16.4%
Type of travel				
Mainly staying at destination **	49.8%	45.5%	42.2%	57.3%
Doing day trips around destination **	38.0%	43.6%	43.9%	30.5%
Roundtrip w. several destinations	6.5%	5.7%	8.0%	6.3%
Main transport mode choice for "Sommerfrische" trips				
Arrival—by car **	55.9%	56.5%	49.6%	62.8%
Arrival—by public transport *	18.2%	18.5%	22.6%	14.1%
Arrival—Bike or walking *	1.4%	3.5%	0.4%	0.7%
On-site—by car	25.1%	22.7%	25.4%	27.6%
On-site—by public transport **	14.5%	19.2%	14.9%	11.5%
On-site—cycling	6.7%	8.5%	7.3%	5.3%
On-site—afoot **	20.1%	18.1%	14.9%	25.3%

** indicates significant results with $p < 0.05$, * indicates results with $p < 0.1$.

4.5. Mobility Behaviors on Refreshing Trips to Near-Urban Areas

The presented survey differentiates between modes of transport chosen for the journey towards and those within the destination (on-site mobility) since major differences between them were expected. This was confirmed by the study's results as illustrated in Figure 5. It became evident that car is particularly important for the journey towards the destination, being chosen as the primary mode of transport by 72% of respondents. In contrast, only 32% of respondents used their car as the main transport mode at the destination itself. Public transport, too, is rather used for journeys towards the destination: A total of 24% chose to travel by train to a refreshing destination, while 19% used public transport offers for on-site mobility. Regarding active modes of transport, the trend is reversed: While these modes are basically inexistent for arrival (pedestrian 1%, cycling 1%), they play a significantly greater role at the destination (pedestrian 26%, cycling 9%). These numbers suggest that hiking and cycling are popular activities in "Sommerfrische" destinations. The fact that 14% of respondents did not indicate any mode of on-site transport gives another hint toward the preferred activities in "Sommerfrische" destinations: Visitors often seek relaxation. The dominance of cars primarily shows for arrival journeys and is significantly lower at the destination itself.
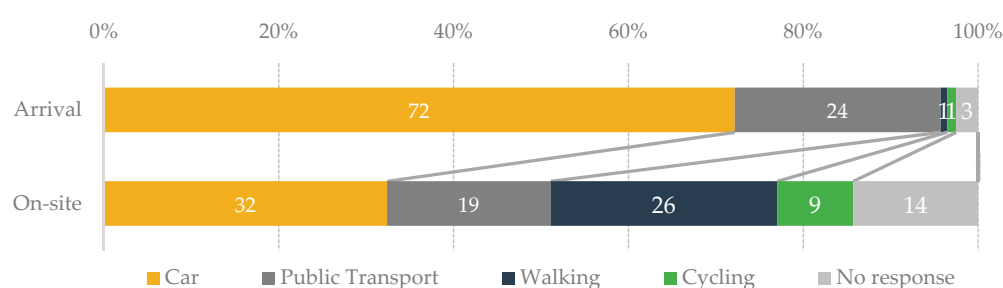
Figure 5. Main transport modes used for arrival and on-site mobility, *n* = 679.

With regard to respondents' attitude towards car-free travel, the analysis shows that the majority of respondents indeed considers it as reasonable (78%) and worthy of support (76%), yet respondents' personal willingness to undertake car-free travel is significantly lower (54%). This reluctance could derive from a lack of experience with car-free travels: Only 44% of respondents stated that they had already in the past travelled to refreshing destinations without the use of a car. The data illustrated in Figure 6 clearly reveal the discrepancy between respondents' generally positive attitudes towards car-free travel and their limited personal commitment to put it into practice. This trend is aggravated when distinguishing between those people that have used the car to reach the "Sommerfrische" destination they have specified and those who arrived by public transport, as visualized below. It becomes visible that members of car-free households consistently rate car-free travels more positively. Surprisingly, not all those who reached the destination without a car stated that they have already done car-free travel.
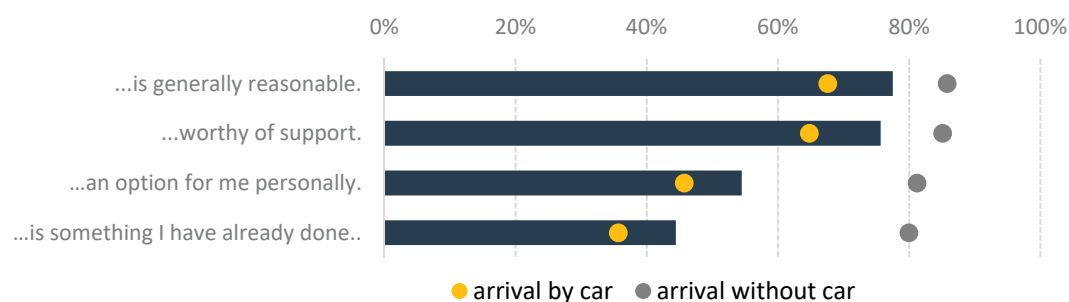
Figure 6. Level of acceptance of car-free travel options towards "Sommerfrische" destinations for the entire sample (blue bar) and two sub-groups (dots for car and car-free travelers respectively), *n* = 877.

Since the number of car-free households is continually rising in metropolitan areas such as London or Vienna [48–50] this segment of the population might play an increasingly relevant role as a target group in the tourist sector. The following characterization of car-free households is based on a mean value comparison between car-free and car-owning households and contains only those attributes for which the two groups showed statistically significant differences.

Overall, the data indicate that car-owning households tend to travel more often. This holds true for both day trips, as well as short and long-term holidays. While car-owning households on average stated that they had undertaken 4.5 "Sommerfrische" trips in the last two years, car-free households amounted did only 3.3. Furthermore, respondents of car-owning households were often accompanied by their partner and/or children, whereas respondents of car-free households travelled more often with friends or by themselves. This is also reflected in household size, which lay at 2.44 for car-owning households (with a significantly higher number of children in the household), compared to a size of 1.75 for car-free households.

This difference in household structures has a corresponding effect on leisure habits and the related mobility needs of each group. While members of car-free households often seek out parks/forests or other refreshing urban spaces on hot days, "escaping the city" was the adaptation strategy most often cited (21%) by respondents of car-owning households (by comparison: 12% of respondents of car-free households chose "escaping the city" as an adaptation strategy).

With respect to the respondents' individual perception of refreshing, near-urban destinations, the survey reveals that members of car-free households found these destinations to be more challenging to reach. It is therefore hardly surprising that car-free households named enhanced accessibility among their most desired improvement measures. In the context of desired improvements of the overall supply quality, this study also evaluated the respondents' interest in specific measures for climate-friendly transportation (see Figure 7). Regarding the appeal of the proposed mobility offers, car-free households again consistently evaluated these offers more positively; however, the order into which they were placed was the same among both groups. A reasonably priced journey without having to switch vehicles constituted the most appealing option among all suggested offers or improvements, for both groups alike.

Figure 7. Interest in different transport/mobility offers, illustrated as a deviation from the mean interest in the respective offer (mean for each variable—scale 0 to 1—is added in brackets), *n* = 877.

4.6. Relevance for Sustainable Regional Development—Results from the Future Workshops

The fact that tourism (especially summer tourism and "Sommerfrische") can play an important role in regional development was clearly recognised by the future workshops in both regions. Most participants of the future workshops expect a reduction of emigration, especially of young people in case the tourism development is fostered. Enough jobs for locals could counteract the brain drain and company closures to their opinion. A vacancy of buildings and the impression of an "extinct region" could be avoided consequently. Furthermore, positive influence on infrastructure is expected in the

two regions, such as primarily the expansion of public transport, local suppliers and medical care Positive effects to prevent depopulation and brain drain are expected by the locals.

Both regions aim to commit themselves to sustainable tourism development. They want to integrate a sustainable development in their daily life e.g., by permaculture, increased consumption of local products and environmental education. In their expectation, tourism that focuses above all on the beauty and originality of nature can also contribute to a positive natural development of a region, e.g., in the form of an expansion of nature park areas. The two areas expect positive effects on local people's behavior, who might become aware of the natural treasures of their region. Some regions already offer their guests attractions where they can support local people: e.g., by landscape conservation measures such as assistance in mowing pastures or felling trees. This could create a win-win situation for regional development, support the needs of the regional population and stimulate new tourism activities. Both regions hope that regional economy can benefit from more guests if it creates specially tailored offers, e.g., regionally produced souvenirs for guests, marketing of "self-sufficiency products". In their mind, it is important that locals identify with the tourism focus of the region. In the two workshop areas focus can also be on "reduction" in the sense of "back to the roots" (simple life, WiFi/Internet-free, no electricity, no running water, regionally produced food etc.).

Both regions are aware that they can act as a retreat for heat-infested city dwellers. Temperatures—especially at night—are well below the heat records of cities like Vienna. Cool summer nights appeal guests who are looking for a restful night's sleep. The touristic advertising offers of these regions still take up too little of these aspects and should be improved. The regions are also currently even more concerned about "bad weather alternatives" than about the effects of climate change in relation to heat in neighboring cities. In the sense of the "Luftkurorte" (climatic spas) that were prominent in the last century, a new counterpart to "pleasant summer climate resorts" or "Sommerfrische-villages" should possibly be created, which could not only promote good air but also cool air. To avoid maladaptation, climate-friendly travel should be set as standard in these regions.

Due to the need to create sustainable travel options and because of the relative remoteness of the two case study regions, the issue of regional and local public transport was perceived as utterly important. One region might gain attraction through the development of a high-speed train connection at the entrance of the valley. Again, the connection in the region remains a challenge and gains increasing relevance, in particular, to benefit accordingly from the new opportunities to attract car-free households. Both case study regions are directly adjacent to each other. A cross-border (federal states border) transport concept would possibly benefit both regions too.

5. Discussion

5.1. Adaptation to Heatwaves and Expected Changes in Tourism Demand

Overall, the investigations conducted within study reveal that half of the respondents experience high temperatures inside their city apartments as "bearable", while a little more than a third of the respondents perceives them as "burdensome". In relation to the record-breaking heatwaves of the summer of 2015, around two-thirds remembered the heat to be "burdensome" and/or as "particularly challenging at night".

These results are in line with several recent studies and published strategies (see [9] for a comprehensive summary), which describe heat stress as a fundamental issue that demands substantial efforts to adapt on the part of the population. The results of this study also re-enforces the conclusions drawn in several recent tourism studies [11,15], namely that heatwaves are already experienced as burdensome by large parts of the urban population. The gained insights, moreover, confirm studies on international cities, which describe heat as an increasingly common phenomenon [71] that can represent a problem for both residents as well as tourists [72,73].

Besides the heat, the weather conditions play an important role as a trigger for tourism demand. The results of a study by Falk ([74], p. 24) show that average sunshine duration and temperatures in

the peak summer season "had a significant and positive impact on domestic overnight stays in the same season, whereas average precipitation had a significantly negative effect". These impacts are target-group specific of course as e.g., Arabic guests appreciate moderate weather conditions.

Climate and weather patterns are also an essential resource for outdoor tourism activities. Therefore, changes in climate and weather patterns might affect the future state of tourism. A study by Grillakis et al. [75] analyzed the effects of a 2 °C global warming on summertime climate comfort in the sense of exercising activities that involve light body activity.

> "*The results indicate improvement in the climate comfort for most European areas for the May to October period. For the June to August period, central and northern European areas are projected to improve, while marginal improvement is found for Mediterranean countries. Furthermore, in specific cases of adjacent Mediterranean areas such as the southern Iberian Peninsula, the June to August climate favorability is projected to reduce as a result of the increase to daytime temperature*" ([75], p. 1205).

With respect to leisure activities during times of severe heat, most respondents in this study stated that they looked for ways to cool down. Hereby, two opposing adaptation strategies emerged from the data, both employed with the same degree of frequency (seeking refreshment outdoors or staying indoor). Similar to Babcicky and Seebauer's study [42] of the populations of the cities of Graz and Leibnitz, this study found that people from 50 years onwards were particularly likely to retreat into their own apartments during heatwaves. By contrast, adaptation strategies of younger age groups also included trips to the countryside to escape the heat. Around 20% of Viennese respondents chose to leave the city as an adaptation strategy in times of extreme heat. In Babcicky and Seebauer's study, only 8% of respondents named "trips to the countryside" as an adaptation measure they had applied in the past. This study demonstrates that the willingness to leave the city is so far greater among the Viennese population than in smaller cities such as Graz and small towns such as Leibnitz. The larger the metropolitan areas are the stronger the impact of heatwaves might influence the behavior of the citizens also in the future.

In this context, Babcicky and Seebauer [42] also underline the danger of maladaptation, since escaping the city to the countryside can contribute to climate change by causing additional CO_2 emissions, especially if no "climate-friendly" transport options are available or used.

5.2. Travel Behavior and Acceptance of Climate-Friendly Transport Modes

The insights gained in this study emphasize the crucial importance of reducing the complexity of car-free journeys to the destination. For the respondents, the most critical concerns relate to the organization of luggage transport (including sports equipment, suitcases, etc.), a minimal number of required changes between vehicles (ideally no required changes), and lower costs. These points are in line with the results presented in various other studies, that also highlight the perceived or actual difficulty of planning and performing travels by rail, especially when carrying luggage (see for instance [76–78]).

The travel behavior of the Viennese respondents living in car-free households differs significantly from those living in car-owning households in several key areas. Individuals who do not own a car generally travel less frequently and respond to heatwaves less often by leaving the city than their car-owning counterparts. This situation may be explained by the fact that spontaneous trips, in particular, are more feasible by car, as such trips were undertaken significantly less often by car-free households. Moreover, they tend to rate the accessibility of "Sommerfrische" destinations more poorly than those owning a car. Their infrequent visits to "refreshing" destinations can, therefore, be linked to the way these destinations are—or appear to be—difficult to access.

The results of the survey, here, clearly demonstrate that there is still a lot to be done in the domain of public transport travel, both in terms of creating more options for travelers to plan and execute uncomplicated spontaneous trips, as well as the way existing offers are communicated to the greater

public. A stronger focus on demand-oriented tourism mobility options seems to be a fruitful way forward, as previously suggested by other studies [78]. Specifically, the results of this study suggest that the connection of flexibility with affordability should be the core challenge of such offers. Gronau and Kagermeier [78] highlight, however, that negative associations with public transport (as being rather "un-fun") often weigh stronger than a good public transport connection, especially when performing leisure trips.

Since most places already allow access via public transport, on-site mobility involves a greater element of uncertainty. Destinations will have to address this issue head-on and work towards alleviating doubts, preferably already in the tourists' planning phase. To this end, they may take advantage of existing synergies between touristic and ordinary, regional traffic to improve mobility for different user groups without exceeding limited financial resources.

This suggestion also responds to the results of this study. While journeys to the destination have shown to be strongly dominated by car-use, this study revealed that on-site mobility is much more diverse. The main modes of transport used by respondents to reach their destination were relied upon much less often on-site and were frequently replaced by other modes (e.g., cycling and walking). This constellation—almost half of the survey's total number of respondents currently take the car to their destination but do not use it on-site—implies that there is already a fairly large number of people who could potentially conduct their "Sommerfrische-travel" without a car. A study in Berlin came to a similar conclusion, demonstrating that 36% of respondents who regularly use a car in their daily life could picture themselves travelling without a car to a holiday resort [54].

Despite the burden of negative associations, this study, however, also highlights the suitability of leisure travels for using public transport and the willingness of travelers to do so. The study by Schlemmer et al. [79] for example underlines the increased willingness among tourists to try out other means of transport during their holidays. Their mobility survey conducted in western Austria showed that decision-making factors and mobility needs during holidays significantly differed from those in everyday life. During holidays, respondents displayed greater willingness to switch to public transport than in their daily lives, which was in turn related to activity levels and people's willingness to partake in physical activities on-site. This propensity can provide a valuable opportunity for destinations to develop attractive mobility offers which promise both comfort and interesting experiences. Thereby, destinations may simultaneously support their clients in experimenting with and consolidating new travel habits and sharpen their own touristic profile. In doing so, destinations should try to present alternative travel options as "fun" rather than just functional since this seems to be a relevant criterion for leisure trips [78].

These findings suggest that the provision of climate-friendly modes of transport needs to be a priority. Tourism is always closely linked to mobility. Therefore, sustainable tourism should be linked to the concept of sustainable mobility. Destinations should consider mobility as an essential strategic component of sustainable tourism planning which gives them the chance to attract emerging and increasing segments of sustainable demand [80].

5.3. Motive Group Specific Travel Demand

To help ensure that the development of mobility offers can be sustainable, detailed results in consideration of different travel motives can offer a more precise indication of urban dwellers' travelling needs. Those predominantly interested in "recreation close to nature" constituted the largest segment of respondents. This group displayed a two-pole modal choice; both the car and public transport were used for journeys to the destination. Meanwhile, the segment looking for "manifold experiences" more often travelled by public transport and on foot. Lastly, those travelling with the motive to be "sports and outdoor" exhibited the widest range of used transport modes.

Regarding their potential for further changes in mobility behavior, two groups particularly stood out: The "physically active" segment and the segment "looking for diverse experiences". Both travel above average on foot or by bicycle.

The "sports and outdoor" group could be tempted to switch to car-free travel through special offers, such as hiking buses and bicycle transport-offers (see the example of South Tyrol mobile). These suggestions are in line with recommendations published by the Danube Competence Center [81], which saw the biggest potential for climate-friendly mobility patterns in the segment "nature and ecotourism". Additionally, Solèr et al. [82] found out that the guest segments "outdoor friends" and "social and sports active" are particularly open for climate-friendly mobility solutions. They assume a further potential for the type of "tradition-conscious" when combined with hiking or walking. They state that climate-friendly mobility is not only appreciated by regular customers but also has the potential to attract new guests.

Offers that enable easy access to different attractions are particularly interesting for the group looking for "manifold experiences". Such offers could be comprised of shuttle buses to tourist sites, as well as on-site carsharing systems, (e-) bike or Segway rentals. The group pursuing "recreation close to nature" may carry a large potential to make the switch to public transport based on their on-site mobility habits (journey to the hotel/spa and few/no further transport routes at the destination). Yet, this segment also displayed a particularly strong affinity for car-use as their preferred mode of transport for the outward journey. In order to gain a deeper understanding of possible tourism mobility patterns in relation to each of these differently motivated segments, further research will be necessary, as well as a detailed comparison with other transport-related segmentations (see for example [83]).

To address psychological barriers which may impede the switch to climate-friendly modes of transport, it would be a big advantage to customize offers and communication strategies to each target group's needs. Such measures may not only boost interest in the introduced initiatives but may indeed embolden some to "take the plunge". Therefore, further research could be useful that identifies the needs of people travelling without a car to develop mobility and tourism offers that diminish the perceived complexity of car-free travels.

5.4. Planning Implications

Overall, it has been determined that personal attitudes towards car-free travel constitute a big hurdle for the acceptance of initiatives encouraging the use of public transport. Particularly among respondents who use the car for their outward journey, this study observed a significant gap between general attitudes and actual behavior. While these respondents generally rated the idea of going car-free worse than those who were already travelling without a car, their approval rate sunk even further when it came to an assessment of their own habits and the likelihood of a behavioral change. Just under a half of respondents travelling by car stated that car-free journeys might be an option for them in the future, whereas only a third stated that they already had experience with car-free travel. These numbers confirm the results presented in several other recent studies [84,85]. The recommendations published by the project "Last Mile Link" emphasize the importance of gaining different experiences in dealing with alternative mobility options in order to dispel fears, especially as the urge to hold on to old habits such as car-use will instinctively appear as the most comfortable option [86]. Possible initiatives could include special events or introductory offers.

To counterbalance this lack of acceptance or willingness to "switch", it cannot be enough to expand and improve the range of available offers. Mobility offers increase their appeal when they confront the client with a concrete added value [78]. Aside from cost advantages, this is mainly achieved by conveying a "novelty", "experience" or "fun" factor (e.g., electric cars, e-bikes, e-scooters, bicycle taxis, horse-drawn carriages, boats, rafts, nostalgia busses, rickshaws). Therefore, innovative mobility solutions should become an integral part of the overall holiday experience.

6. Conclusions

This first representative study on the heat stress of Viennese citizens, a two million capital city, and the adaptation behavior of those stressed by the heat confirms the likely increase in demand to escape to near-metropolitan refreshing areas in times of heatwaves for both leisure and vacation

purposes. This trend could lead to (re-)vitalization potential for mountainous tourism areas suffering from losses in winter tourism as well as remote destinations rich of forests and/or water bodies, which are often characterized by depopulation and degradation of infrastructure.

A closer look at the respondents' tourism mobility behavior when travelling to rural Austrian areas, reveals a high risk for an unsustainable development and "maladaptation". Although the high and increasing share of car-free households in Vienna would suggest a strong demand for public transport, the study reveals that the likelihood to travel by car towards such destinations is even surprisingly high among this group. Results of this study suggest focusing firstly on the on-site mobility since most "Sommerfrische" travelers did not rely on a car during their stay at the destination. A closer look at the specific traveler segments of car-free households as well as their travel motives and mobility-related needs and preferences can help to develop more attractive mobility offers. As such, it might be interesting to analyze the different spatial characteristics and the supply quality of those destinations that are already visited by car-free travelers.

To maintain or increase the sustainable development of a region, the attractiveness to the tourists' needs should, however, not be the sole focus. Where possible, the long-term and multi-seasonal benefit should also ameliorate living conditions for the local population as to also prevent depopulation amongst the youth.

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Paper

Author's contribution:

The thesis author was the main contributor. Her roles included the conception of the paper, the analysis of data using SEM as well as the write-up of most parts of the paper (exceptions see below).

RH helped with the model development, the interpretation of results and commented on the methodology section. AJP wrote heat-related parts of the literature section and contributed to the interpretation of results and the write-up of the discussion, especially regarding the paper's planning implications. WU commented on the initial concept of the manuscript and helped with the interpretation of results.
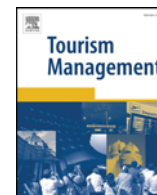
The mountains are calling! An extended TPB model for understanding metropolitan residents' intentions to visit nearby alpine destinations in summer

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ABSTRACT

This study investigated the suitability of an extended Theory of Planned Behaviour (TPB) to research the travel intention of metropolitan citizens to nearby destinations. The consideration of heat waves in this context is a novel approach. The survey data was collected from 877 Viennese respondents. Structural equation modelling shows a very good fit of the final model to the data; model extensions yield a strong increase of explained variance. The results suggest that heat-related change of intention is influenced by the strength of heat stress perceived during past heat waves. Nevertheless, subjective and social norm are the strongest determinants of intention, whereas attitude is a very weak predictor. Additional significant predictors are outdoor sports as a travel motive, media coverage, and past behaviour. The first application of an extended TPB model to summer tourism in the context of climate change yields important insights as to how climate change affects the destination choice of summer tourists. The results provide valuable starting points for attracting heat stressed metropolitan visitors.

1. Introduction

Understanding tourism behaviour and the intention to visit a destination are essential for tourism management. Major challenges such as economic crises and climate change require an extended view on destination choices and the factors determining them. Among the theoretical approaches to understand tourism destination choices[1] the Theory of Planned Behaviour (TPB) is a widely perceived option. It has been used several times in the context of tourism choices, including accommodation choice (Han, 2015), environmental values and travel behaviours (Goh, Ritchie, & Wang, 2017), as well as destination choice (AL Ziadat, 2015; Bianchi, Milberg, & Cúneo, 2017; Quintal, Lee, & Soutar, 2010; Quintal et al., 2010; Yuzhanin & Fisher, 2016) – in particular to survey the travel behaviour of Asian tourists or destination choices towards Asian countries (Chien, Yen, & Hoang, 2012), Hong Kong (C. H. C. Hsu, Kang, & Lam, 2006; Lam & Hsu, 2006), China (C. H. C. Hsu et al., 2006; Sparks & Pan, 2009), and Taiwan (T. K. Hsu, Tsai, &

Wu, 2009).

However, few studies have used the TPB to address major challenges such as climate change and its impact on the intention to visit a destination. This topic has mostly been studied using other approaches, in particular Discrete Choice Experiments (DCE). Several studies have used DCE to examine the expected impact of climate change on winter sport destination choice, e.g. Richardson and Loomis (2005), Kelly, Haider, and Williams (2007), Unbehaun, Pröbstl, and Haider (2008), Reilly, Williams, and Haider (2010), Landauer, Pröbstl, and Haider (2012), Pröbstl-Haider and Haider (2013), and Landauer, Haider, and Pröbstl-Haider (2014). Some further studies investigated the impacts of climate change on both winter and summer tourism destination choice (Landauer et al., 2014; Landauer et al., 2012; Pröbstl-Haider, Haider, Wirth, & Beardmore, 2015; Steiger, Abegg, & Jänicke, 2016). The usage of DCE is often reasoned by emphasizing the advantage of choice experiments in the context of surveying unexpected, novel developments. Some authors expressed doubts regarding the suitability of the TPB in

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this context. Yuzhanin and Fisher (2016) provide a relatively small meta-analysis of 15 studies on destination choices in which they analyse the efficacy of the TPB for modelling these choices. Based on the finding that different studies obtain diverging and contradictory results they argue that the TPB might be less suitable in this context than in other tourism research contexts. Furthermore, Pröbstl-Haider and Haider (2013) consider DCEs superior over the TPB in treating currently "non-existing alternatives" in light of climate change.

Given their different profiles we do not consider DCEs and TPB as substitutes. DCEs focus on the attributes of the choice object (price, service quality etc.); their strength lies in capturing the influence of these attributes on the choice. In contrast, the TPB emphasizes the importance of innate personality disposition of the choice maker in determining their choice. In doing so, it allows for a consideration of psychological factors in a generally self-controlled yet socially influenced decision process. These characteristics make the TPB particularly suitable for explaining tourism choices: They are subject to very specific service characteristics, such as high risk, required and possibly complex advance-planning, as well as a tendency towards collective decisions (Karl, 2018; Sirakaya & Woodside, 2005), which tend to be influenced by various different reference groups (Tasci & Gartner, 2007) and are often reached collectively with fellow travellers. A particularly important issue in Austria is the summer tourism to near-metropolitan mountainous regions; it has a long tradition and high economic relevance. Several studies discussed the impact of heat waves for the travel intention to these regions on a theoretical level, as highlighted among others by Allex, Brandenburg, Liebl, Gerersdorfer, and Czachs (2013), Fleischhacker and Formayer (2007), and the APCC (2014). However, empirically speaking, this topic is still under-researched. Some studies examined the impact of weather conditions and heat waves on travel behaviour using conventional questionnaires without choice experiments (Serquet & Rebetez, 2011; Rosselló-Nadal, 2014, Dubois et al., 2016). None of these studies surveyed which factors influence the behavioural adaptation of citizens relating to their visits of near-metropolitan areas.

The innovation of this study is (i) the application of the TPB to investigate the impact of climate change on the behavioural intention to visit summer tourism destinations as well as (ii) a TPB-based stated preference experiment exploring the response of intentions to an assumed increase of urban heat waves. The related research objectives are to (i) understand the intention of metropolitan residents to visit nearby tourism destinations in general and (ii) analyse the expected change of intention resulting from an increasing occurrence of heat waves in the future. Using a large survey of the Viennese population, we tested the suitability of the core TPB as well as an extended set of predictors to identify those factors, which (i) determine the destination choice intention and (ii) mediate the effect of increasing heat occurrences on the change of intention. Within the extended TPB model, the focus is on including potentially missing aspects within the context of destination choices, which will be discussed in section 2.1.

Within the framework of this paper we define "summer retreat" destinations (SRDs) as being in (1) rural, mountainous regions (2) in proximity to metropolitan areas (max. three hours away) with (3) lower than average temperatures in summer. Fig. 1 illustrates this.

The TPB is a widely used psychological theory of attitude-behaviour relations. It states that a defined behaviour is a reasoned process that is determined by an intention to perform it (Conner & Armitage, 1998). In turn, the intention to engage in a specific behaviour is a function of the following constructs:

(1) a set of attitudes towards the behaviour, defined as a person's evaluation of a specific behaviour with regards to its favourability or attractiveness (Steinmetz, Knappstein, Ajzen, Schmidt, & Kabst, 2016),
(2) subjective norms or the "*perceived social pressure to perform or not to perform the behaviour*" (Ajzen, 1991), and

(3) the perceived behaviour control (PBC) which is also defined as a person's self-rated ability to perform a behaviour in terms of capabilities and resources such as information, time, and money (Anable, 2005; Untaru & Ispas, 2014).

These constructs are themselves controlled by behavioural, normative, and control beliefs, respectively (Ajzen, 1991; Steinmetz et al., 2016). Based on these original TPB constructs, the paper proposes the following initial hypothesis: *The attitude (H1a) towards summer retreat destinations, subjective norms (H1b), and perceived behaviour control (H1c) positively influence the behavioural intention to visit summer retreat destinations.*

It has proven useful to extend the TPB to its specific study context, as has been done by many researchers. A paper by Conner and Armitage (1998) specifically investigated the various extensions that have been proposed to the TPB and reviewed their additional value to the model. They concluded that there is growing evidence for the inclusion of further TPB constructs including "*belief salience, past behaviour/habit, the structure of the PBC construct, moral norms, self-identity, and affective beliefs*" (Conner and Armitage (1998), p. 1452). A similar meta-analysis by Hagger, Chatzisarantis, and Biddle (2002) focussing on the field of physical activity finds that self-efficacy and past behaviour are strongly influential factors that should be included in further TPB studies in the field. Ajzen himself stated that the TPB is, "*in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behaviour after the theory's current variables have been taken into account*" (Ajzen, 1991).

Within the wide range of fields where the TPB is used, these studies have proposed many different suggestions for extensions. These are, among others: moral norms and obligations (Ajzen, 1991; Anable, 2005), impulsive decisions (Conner & Armitage, 1998), emotions (Moons & De Pelsmacker, 2015), past behaviour (Anable, 2005; Bamberg, Ajzen, & Schmidt, 2003; Verplanken, Aarts, van Knippenberg, & van Knippenberg, 1994) as well as environmental beliefs and consciousness (Anable, 2005; Juvan & Dolnicar, 2014; Untaru & Ispas, 2014), self-efficacy (Anable, 2005), identity (Forward, 1994), and familiarity and safety (Bianchi et al., 2017; Quintal et al., 2010). Visibly, the literature on relevant factors influencing destination choices offers a wide range of possible candidates within an extended TPB model. In order to add only those relevant to the given study context, we conducted a mix of a quantitative pre-survey and qualitative focus groups with tourism experts and citizens. The results of these studies with regards to the suitability of different TPB extensions is discussed by Juschten et al. (2017, pp. 183–193).

Existing literature on tourism destination choices often studies social norms within the overall framework of norms or social influence. Hsu et al. (2006), for example postulate that there is a higher influence of one's social surrounding in service consumption choices compared to product purchases. It seems to be particularly high in tourism choices due to the higher perceived risk of such choices. Regarding the desire to comply with other people's opinions, Hsu et al. found that primary reference groups (such as family and friends) were more influential than secondary reference groups (such as travel agents). Assuming that many people in Vienna have already visited near-metropolitan SRDs, the influence of social norms might be substantial. The study of Juschten et al. (2017, pp. 183–193) also suggests that the desires and the place of residence of close friends or family are very decisive for the choice of tourism destinations. Family members (especially children) also appeared to be influential on the entire family's destination choices. Accordingly, this study integrated the construct of (positively formulated) social norms into the TPB with the hypothesis that *social norms positively influence the behavioural intention to visit SRDs in the future (H2a)*.

With regards to the influence of media on shaping destination choice intentions within the TPB only few studies exist to date. The study by Sparks and Pan (2009) investigated the role of information
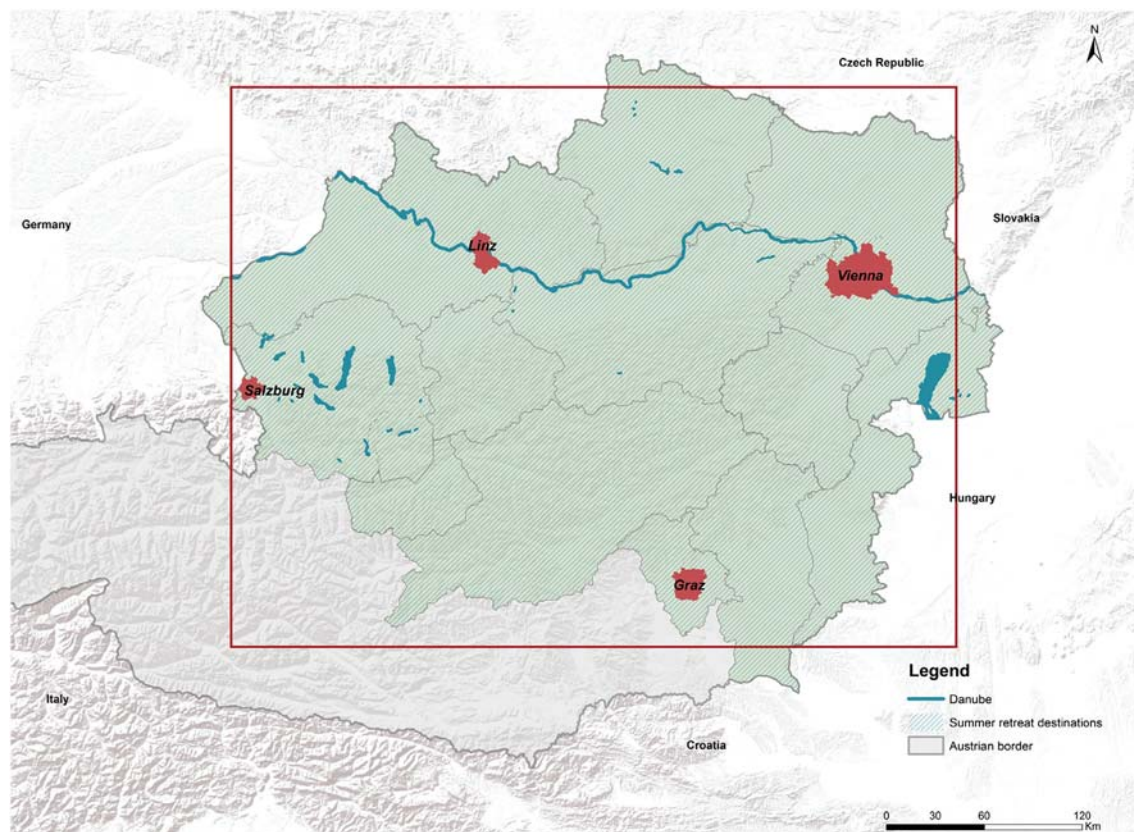
Fig. 1. Map of Austria with SRDs, highlighted by green diagonal lines Literature & hypothesis-formulation. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

sources in shaping destination images and influencing people's travel intentions in a study not based on the TPB. They find that media play an important role in shaping tourists destination image, which in turn influences the intention to actually visit a certain destination (Lee, 2009; see; Tasci & Gartner, 2007, p. 422). Furthermore, the results of Juschten et al. (2017, pp. 183–193) suggest that people's destination choices are inspired by advertisements in different digital and analogue media as well as general public campaigns. This construct was therefore included in the set of hypotheses despite the lack of empirical evidence or literature for including it. Literature also provides no clear guidance concerning its position within the model. As stated by Nabi and Krcmar (2004) as well as Sparks and Pan (2009), media coverage or media enjoyment might have a direct influence on people's attitudes or destination image. Hsu et al. (2006) on the other hand highlight the influential role of interpersonal information channels such as family, friends, or other reference groups for travel decisions. This argument may lead to the assumption that media coverage could be an influential factor to subjective norms and influence intentions only indirectly. Therefore, the following hypothesis is proposed: *The coverage of summer retreat destinations in public media positively influences the attitudes towards these destinations and the subjective norm (H2b/c).*

Repeated visits can have several reasons or advantages including reduced risks, emotional attachment, desires for further exploration and the desire to show the destination to other people (Phetvaroon, 1993, p. 199; Sirakaya & Woodside, 2005). While not included in the core TPB model, Ajzen (1991) was aware of its importance and stated that, "*perceived behavioural control (…) is assumed to reflect past experience as well as anticipated impediments and obstacles*", indicating that it should already be included in the PBC. Therefore, past behaviour should either have a very high covariance with PBC or not have any additional explanatory value at all. Other studies contradict this statement by presenting evidence for the strong importance of past behaviour as a

separate construct beyond the PBC. In the context of tourism destination choices this has been done by Chien et al. (2012), Lam and Hsu (2006), and Phetvaroon (1993, p. 199). In a study by Bianchi et al. (2017) a related construct called "destination familiarity" has been included, assuming that tourism travel intentions are affected by the familiarity with a destination and the reduced risk it entails. The qualitative results of Juschten et al. (2017, pp. 183–193) also provide evidence that the feeling of "knowing one's way around" (both in the planning and during the trip) resulting from past travel experiences can positively influence future visiting intentions. Beyond tourism destination studies, past behaviour is frequently included in studies on travel mode choices - often referred to as "habit" (Anable, 2005; Bamberg et al., 2003). Assuming the importance of past visits to SRDs beyond the PBC we hypothesize that *past travel behaviour towards these destinations positively influences the behavioural intention to visit them again (H2d).*

The role of travel motives, defined as the "*reasons why people travel*" (Chien et al., 2012, p. 492) or choose a specific destination, is largely unclear within the framework of the TPB. Quintal et al. (2010) for example highlight the importance of own preferences and personal goals for tourism destination choices, both being strongly linked to the motives underlying the trip. Within his discussion on the importance of both push and pull factors as travel motivators, Lam and Hsu (2006, p. 590) define push factors as "*intrinsic desires of human beings, including the desire for escape, novelty seeking, adventure seeking, dream fulfillment, rest and relaxation, health and fitness, prestige, and socialization*". They don't integrate them into the TPB model by arguing that push factors are mainly useful for explaining the overall desire to travel, while pull factors are useful for explaining specific destination choices. There are, however, studies integrating travel motives into the TPB model. Hsu and Huang (2012) for example attached them to the construct of attitudes. Chien et al. (2012) on the other hand argue that pull and push factors are to be included as separate constructs in the TPB model. Their

Fig. 2. Proposed extended TPB model based on literature and pre-studies.

results suggest that travel motives (combined as one single factor) had a significant direct influence on behavioural intention. A structural model (not TPB-based) by Lee (2009) also highlights the direct influence of travel motives on future behaviour. Therefore, a wide range of travel moti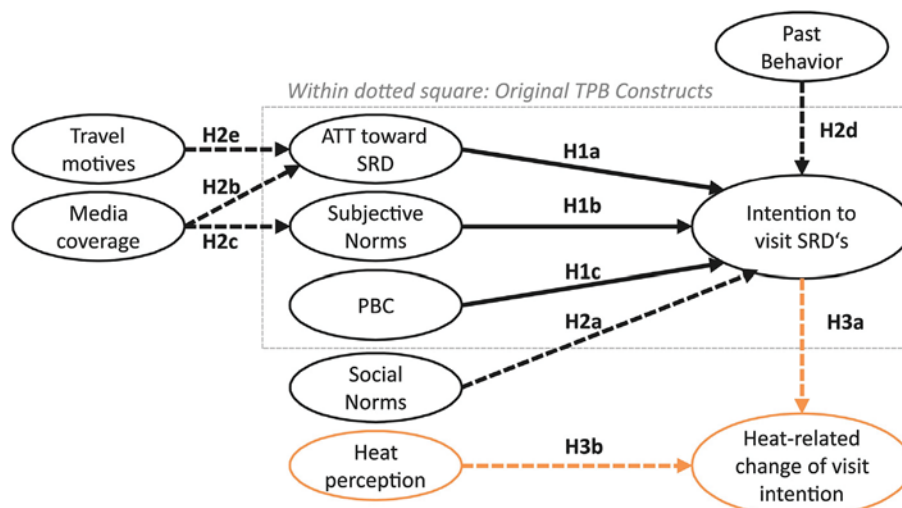vators, in line with those covered in the study by Phetvaroon (1993, p. 199), have been included in this study with the associated hypothesis: *Travel motives have a significant effect on the attitudes towards summer retreat destinations and therefore indirectly influence the behavioural intention to visit them (H2e).*

Finally, it is expected that hot days (with temperatures greater than 30 °C) lead to an increasing demand for short-term trips to refreshing areas, in particular from nearby urban source markets (Chladek, 2005; Serquet & Rebetez, 2011). There is strong indication from several studies that climate and weather conditions affect tourism travel behaviour in many ways. Various authors have assumed that with an increase in hot summers and heat waves more inhabitants of large cities will seek refreshment in rural tourism destinations in higher altitudes (Götz et al., 2012; Müller & Weber, 2008; Pröbstl-Haider et al., 2015). We apply for the first time TPB-based stated preference experiments to quantify the impact of heat waves on citizens' intention from metropolitan areas to leave for nearby refreshing rural areas. This novel approach is associated with two sub-hypotheses:

"The current intention to visit summer retreat destinations positively influences the change of intention to do so in case of increasing occurrences of heat in cities." (H3a).

A range of heat-related predictors can explain the change of intention to visit summer retreat areas in case of increasing occurrences of heat in the future. (H3b).

2. Methodology

2.1. Study design and underlying assumptions

1 This investigation consists of three consecutive methodological parts, that aimed at investigating the relevant factors for allowing citizens and destinations to adapt to climate change related increases of urban heat waves by fostering sustainable rural tourism in the proximity of metropolitan areas. The three steps are listed below and are explained in further detail by Juschten et al. (2019).

Qualitative Pre-Research Focus Groups with citizens and experts aiming to explore relevant trends and behaviours. The analysis results were used to inform the development of the quantitative survey and broaden the diversity of topics to be covered.

Quantitative Surveys aiming to investigate both attitudes and behaviours of the source market (demand side) in terms of tourism travel behaviour, adaptation intentions (based on the TPB framework) and capacities (potential), and demand for mobility services.

Qualitative Future Workshops aiming to reflect the survey results with two case study destination (supply side) by using a participatory research designs. The discussion results were used to design adaptation strategies to potential demand changes.

This investigation hence follows a mixed method design in order to ensure that results include a variety of different perspectives on both the demand and supply side and potential heat-related perceptions), while at the same time producing representative and transferable results. According to Hewlett and Brown (2018), this pluralism is required to adequately address complex questions.

The heat-related change in intention to visit an SRD within Austria (as a day trip, shorter or longer holiday) was the focal behaviour in this study. A large tourism survey provided the data for the estimation of the extended TPB model, covering the extensions identified in section 2.1. Regarding possible extensions, it seems crucial to highlight that the TPB assumes people to be rational agents performing reasoned actions (Bamberg et al., 2003). As Knabe (2016, pp. 1–256) puts it, the TPB "*is based on the assumption that humans are rational beings that make systematic judgments. The theory does not account for unconscious motives.*" Since tourism decisions require a certain level of pre-planning, information and preparation, this assumption creates less limitations in this context than it might for other consumption choices. However, it still means that the TPB can only grasp the targeted potential influences to the extent that people are aware of them and are able to articulate them objectively (Vogel, 1997). With that in mind, we aimed at identifying the most influential factors on behavioural intention by using the theoretical model in Fig. 2.

2.2. Sampling procedure

A power analysis for sample size estimates was conducted in R using pwr.f2.test {pwr}, based on the notations of Cohen (1988). The results indicated that 204 participants are sufficient to detect even small effect sizes (Cohen's $f^2 = 0.1^2$) at a power of 0.95 and an α of 0.05. However, a larger sample size seemed useful to enable group-specific analyses and

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[2] The assumption was that the intention to visit SRDs is explained by 7 predictors within the extended TPB model, accounting for 10% of the intention's variance.

Table 1
Survey questions relevant to this study (translated from German).

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1) Attitudes towards SRDs
(13 attributes, Semantic differentials on 5-Point Scale from [-2] to [2])
Attributes: attractive, appealing, sunny, affordable, exciting, unique, safe, innovative, easily accessible, refreshing, not crowded, relaxed

2) Subjective norms
(3 items, 5-Point Likert Scale from disagree [0] to agree [1])
The people with whom I travel want me to go to SRDs with them./People whose opinion I value support the visit of such destinations.

3) Perceived Behaviours Control
(7 items, 5-Point Likert Scale from disagree [0] to agree [1])
If I want to visit a SRD, I can simply do so./It is generally no problem for me to visit such a destination./The planning of SR travels comes easily to me./I can afford to visit SRDs./I know where to find information on accommodation and activities in such a destination./It is easy for me to orientate myself in a new environment./I enjoy getting to know new places.

4) Social norms
(3 items, 5-Point Likert Scale from disagree [0] to agree [1])
Many people in my surroundings find SRDs interesting./I can easily imagine that my family or friends would travel to these destinations.

5) Travel Motives
(13 items, 5-Point Likert Scale from disagree [0] to agree [1])
Being active, culinary offers, time with friends, sth. for one's health, culture, learning sth. new, escape heat, meet new people, sth. for the soul, exceptional activity, relax, escape the city, being in nature

6) Role of media coverage
(2 items, 5-Point Likert Scale from disagree [0] to agree [1])
Media coverage (TV, newspapers, online) convey a positive image of SRDs./ Media coverage makes me want to visit a SRD.

7) Past Behaviour
(item 1: 0/1, item 2 and 3: numeric)
Frequency of visits to SRDs in the last 2 years/nr. of regions visited

8) Heat perception
(3 statements, binary scale representing no [0] and yes [1])
Heat is a travel motive/heat is perceived as a burden/the temperature at home during heat waves is very hot

9) General intention
(3 statements, 5-Point Likert Scale from disagree [0] to agree [1])
I intend to visit a SRD this summer./I would like to visit a SRD this summer./I consider visiting a SRD this summer.

10) Heat-related change of visit intention
(3 items, 5-Point Likert Scale: from less [-2] to more [+2] than today)
How often would you intend to visit a SRD in case future summers get hotter?/ How much would you like to visit a SRD in this case?/How often would you consider visiting such a destination in this case?

11) Socio-demographics
This includes variables at the person and household level, such as age, gender, education, profession, adaptation to heat, income, location, second residence, mobility tools and behaviour with varying scales.

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to enable predictions with small standard errors from the sample. The survey conduction took place online between June and July 2017 and was carried out by a large Austrian Online Access panel provider (with approx. 100,000 participants). They contacted the panel members with a short email containing the broad topic "Travelling" and a personalized link to the survey. The participation was restricted using quotas for gender and age to ensure the representativeness of data concerning these characteristics. No stratification according to education, occupation, income or spatial characteristics took place. The completion rate of those starting the survey was 80.6% with an average completion time of 20.4 min. The final sample encompasses 877 respondents (without missing data for all TPB-relevant variables since all related questions were required in the survey).

2.3. Online questionnaire in the source market Vienna

Table 1 shows all items relevant for the TPB-based hypotheses testing. Topics 1–3 and 8 cover the core components of the TPB, topics 4 to 7 cover the extensions of the TPB model and topics 9 and 10 cover the extension for the heat-related TPB model. Topic 11 comprises different socio-demographic data at person and household level beyond the TPB. In order to guarantee the quality of the data this study

conducted a cognitive pre-test with 30 people (personally contacted by the project team) and a technical pre-test with 77 people (already drawn from the Online-Panel provider as part of the overall sample of the main survey) to subsequently adjust and finalize the survey.

2.4. Data analysis: Structural equation modelling (SEM)

After cleaning and preparing the data for further analysis, a first descriptive analysis took place comprising the distribution, means, and standard deviations of all variables. After reviewing these results, an exploratory analysis of all bivariate correlations was conducted in order to gain first insights into the covariance structure and the relevance of the presented hypotheses on the core and extended TPB variables. As a prerequisite for the SEM, the normality for all relevant variables was tested. Within the variables included in the model skewness ranges from −1.314 to 1.463 and kurtosis ranges from −1.984 to 2.174, illustrating good normality according to the limits indicated by Kline (1998). He suggested skewness to be between −2 and +2 and kurtosis between −3 and +3. Afterwards, all relevant variables entered an exploratory factor analysis in SPSS in order to test the strength of generated constructs. The reliability of the constructs was tested in two ways: Internal reliability using Cronbach's α; construct reliability using composite reliability (C.R.). Chapter 4.1 presents the results.

The measurement of destination choice intentions was done using SEM in AMOS, which represents a confirmatory approach. It aimed at testing the causal relationships between the different constructs and the general intention to visit SRDs in the future (INT_G). Given the complexity of the extended theoretical TPB model, we followed a systematic procedure of path elimination and construct extension: First the core model by Ajzen was built up and all variables with factor loadings lower than 0.6 or insignificant path coefficients were continuously eliminated from the model. Afterwards, the additional constructs were added one-by-one after verifying in equal measure their factor loadings, path significances, and effects on the overall explained variance of the model as well as the effect on Model Fit values. Chapter 4.2 contains the results of the final model.

After completing the model explaining the general intention to visit SRDs in the future, the model investigated the influence of heat on this intention in an exploratory manner. Therefore, the construct of "heat-related change of visit intention" (INT_H, topic 10 in Table 1) was added as an additional endogenous variable to the model. In doing so, it treated the questions on this change of intention under the heat assumption as a stated response through a hypothetical intervention. Due to the lack of literature on the relationship between heat and destination choice intentions, the analysis took place in an exploratory manner. For this reason, we systematically analysed the bivariate correlation coefficients of all variables with INT_H and tested them for significance and influence on explained variance of INT_H. The variables included in this exploratory analysis but excluded from the SEM due to lack of explanatory power are (i) home temperature, (ii) structural measures for heat avoidance at home, (iii) adaptation to heat with regards to leisure activities, (iv) tourism behaviour, and (v) heat as a travel motive. Chapter 4.2 shows the final model including all constructs with a significant influence on SRD visit intention.

2.5. Sample description in relation to the Viennese population

2 Due to the chosen recruitment method it was possible to set response quota, thereby allowing for a representative (Viennese) distribution regarding age and gender. All reference values for Vienna are derived from publications based on the micro census of "Statistik Austria" for 2015 (Kaindl & Schipfer, 2017; Stadt Wien, 2017; Statistik Austria, 2018). Based on this data we can observe a slight over-representation of highly educated people in the sample, which is partly because the Viennese education statistics also contain people above 69, who tend to have a lower level of education. Regarding the current

Table 2
Sociodemographic attributes of sample & Viennese population.

	Survey sample	Viennese Population
Average age in years	41.7	40.4
Gender		
Female	51.3%	51.3%
Male	48.7%	48.7%
Highest education		
No or a primary school diploma	7.2%	27.7%
Apprenticeship diploma	32.8%	36.2%
High school diploma	30.1%	19.1%
Higher education/University degree	29.9%	17.0%
Occupation		
Employed	62.1%	60.5%
Unemployed	6.2%	9.3%
Retired	15.2%	9.5%
In education	12.3%	7.0%
Other (staying at home etc.)	4.2%	13.7%
Household Types		
Adult households (HH), no children	73.4%	70.2%
All children between 6 and 17 years	14.8%	17.0%
At least one child younger than 6	11.8%	12.8%

occupation, we can observe a slight over-representation of retired people and those still completing their education. The Viennese population statistics were truncated to the age groups represented in the sample (14–69 years). The age restriction was predetermined by the pool of participants in the online-access panel provider who recruited the respondents but is also underpinned by tourism studies for the Austrian population which show a negative tendency in travel activities for elderly people. This age distribution explains the higher proportion of unemployed and the lower proportion of retired people in Vienna. Table 2 illustrates the sociodemographic attributes.

3. Results

3.1. Description of summer retreat visits

377.4% of respondents indicated that they have visited SRDs in the past two years. This sub-sample received an additional set of questions about the characteristics of one of these visits, summarized subsequently. When asked to place the visited areas as dots on a map, one sees that every respondent has undertaken 4.25 visits in 2.25 different regions on average. The main motives for these visits were relaxation, spending time in nature, spending time with family and friends, as well as treating oneself. The main associations with the term "summer retreat" cover relaxation, landscape features such as forests, mountains and water as well as specific destinations in Austria. 61% of the reported visits took place in summer and more than half were between 2 and 4 days long. The planning happens spontaneously, as 65% of visitors planned their trip less than four weeks in advance. The subsequent section on modelling results refers to all respondents' future visit intention, independent of past visits.

3.2. Measurement models: consistency & construct reliability

To measure the internal consistency, we examined whether the different TPB-related questions conform to the constructs developed by Ajzen and extended based on theoretical insights within this study. Therefore, we performed an exploratory Principal Component Analysis in SPSS (Varimax rotation, using Kaiser Normalisation) on these 48 items. The twelve-factor solution seems most suitable with all eigenvalues above one, all except five factor loadings being above 0.6 and no cross-factor loadings above 0.5, therefore indicating good discriminant validity (Lam & Hsu, 2006). The Kaiser-Meyer-Olkin (KMO) value of 0.893 suggests a very good sample adequacy. The cumulated explained variance of all factors accounts for 63.5% of the total variance. Table 3 shows the rotated factor solutions with all variables' factor loadings,

Table 3
Rotated factor loadings of all TPB-related items.

Construct & Variables	Factor loading	Communality	AVE	C.R.	Cronbach's alpha	
1) Attitude (ATT) - Attractiveness			0.496	0.872	0.870	8.8%
ATT1 - exciting	0.777	0.604				
ATT6 - diverse	0.770	0.593				
ATT3 - attractive	0.710	0.504				
ATT5 - unique	0.699	0.489				
ATT2 - appealing	0.696	0.484				
ATT4 - innovative	0.685	0.469				
ATT7 - sunny	*0.572*	*0.327*				
2) Attitude (ATT) - Convenience			0.478	0.842	0.765	5.1%
ATT8 - not crowded	*0.699*	*0.489*				
ATT9 - affordable	*0.681*	*0.464*				
ATT10 - easy to access	*0.660*	*0.436*				
ATT11 - relaxed	*0.588*	*0.346*				
ATT12 - safe	*0.541*	*0.293*				
3) Subjective & Social Norms (SSN)			0.473	0.841	0.866	8.0%
SSN1 - SubjN 1	0.752	0.566				
SSN4 - SocialN 1	0.745	0.555				
SSN2 - SubjN 2	0.729	0.531				
SSN3 - SubjN 3	0.727	0.529				
SSN5 - SocialN 2	0.616	0.379				
SSN6 - SocialN 3	*0.525*	*0.276*				
4) Perceived Behaviour Control (PBC)			0.469	0.861	0.850	8.3%
PBC6 - orientation	*0.724*	*0.524*				
PBC2 - no problem	0.723	0.523				
PBC1 - feasible	0.720	0.518				
PBC3 - easy planning	0.704	0.496				
PBC5 - information	0.662	0.438				
PBC4 - finances	0.642	0.412				
PBC7 - new places	*0.612*	*0.375*				
5) Role of Media (MED)			0.628	0.771	0.845	3.5%
MED1 - positive image	0.825	0.681				
MED2 - is inviting	0.758	0.575				
6) Past Behaviour (PB)			0.712	0.880	0.701	5.0%
PB1 - nr. of regions	*0.919*	*0.845*				
PB2 - nr. of visits	0.903	0.815				
PB3 - former visit y/n	0.691	0.477				
7) Travel Motive – Outdoor Sports (MOT)			0.558	0.787	0.711	4.1%
MOT1 - health	*0.830*	*0.689*				
MOT2 - active	0.810	0.656				
MOT3 - nature	0.574	0.329				
8) Travel Motive – Culture (MOT)			0.423	0.745	0.587	4.0%
MOT4 - culture	*0.717*	*0.514*				
MOT5 - extraordinary	*0.655*	*0.429*				
MOT 6 - new people	*0.626*	*0.392*				
MOT7 - culinary	*0.598*	*0.358*				
9) Travel Motive – Relaxation (MOT)			0.592	0.743	0.576	3.3%
MOT8 - relaxing	*0.790*	*0.624*				
MOT9 - good for soul	*0.748*	*0.560*				
10) Perceived heat stress (HEAT)			0.509	0.757	0.531	3.4%
HEAT1 - no sleeping	0.730	0.533				
HEAT2 - temp. home	*0.709*	*0.503*				
HEAT3 - negative	0.701	0.491				
11) Intention general (INT_G)			0.590	0.812	0.901	4.6%
INT_G2	0.792	0.627				
INT_G3	0.774	0.599				
INT_G1	0.737	0.543				
12) Heat-related change of visit intention (INT_H)			0.748	0.899	0.898	5.3%

Table 3 (*continued*)

Construct & Variables	Factor loading	Communality	AVE	C.R.	Cronbach's alpha
INT_H2	0.874	0.764			
INT_H3	0.865	0.748			
INT_H1	0.855	0.731			

KMO = 0.893; Bartlett's Test of Sphericity = 18.982.386 at df = 1128 with a significance of 0.000; in italics: variables not included in the final TPB model.

explained variance as well as the Cronbach's alpha, average variance extracted (AVE), and composite reliability (C.R.) of all factors. Appendix 1 contains a table with the means, standard deviations, skewness, and kurtosis for all these variables. C.R. for all factors shows consistently high values above the suggested threshold of 0.6 (ranging from 0.778 to 0.902), therefore demonstrating high construct reliability. Cronbach's alpha for all original TPB constructs is above 0.7, which is considered an acceptable measurement for internal consistency in social sciences (Nunnally & Bernstein, 1994; Yadav & Pathak, 2016). While many authors suggest AVE to be above 0.5 (Han, 2015), values above 0.4 can be considered acceptable for the overall convergent validity of the constructs if all C.R. values are above 0.6, which is the case here (Fornell & Larcker, 1981; Huang, Wang, Wu, & Wang, 2013). This wider margin of acceptance has also been chosen since the reliability and validity values increase after excluding those values that did not enter the final measurement model (marked in italics) due to their negative impact on construct validity (which is estimated slightly differently in AMOS compared to the factor analysis in SPSS).

The first factor represents a good half of the statements on the respondents' assessment of the destinations concerning different destination attributes. It can be interpreted as those attributes describing the region's general attractiveness. In contrast to this, factor 2 covers more specific and convenience-oriented features of these summer destinations. The third factor represents the influence of one's social surrounding, encompassing statements referring to both social and subjective norms. It seems noteworthy that the exploratory factor analysis joins all items belonging to subjective norms and social norms to one factor, suggesting that they represent a common construct. Within the SEM, they will therefore enter as one common latent variable. Factor 4 covers all statements constituting the PBC. Factors 5 to 10 cover the additional constructs of the extended TPB model: Media coverage, past behaviour, all travel motives (outdoor sports, relaxation, culture & diversity) as well as the perceived heat stress. Factors 11 and 12 include both intentions (general/change under heat assumption).

To exclude the risk of multicollinearity between the constructs and in order to obtain first insights into the influence of the different constructs on the behavioural intentions we calculated the bivariate correlation coefficients between the different constructs entering the final model (see Table 4). The strongest correlation between constructs of different measurement models amounts to 0.48 (media coverage and social & subjective norms), which is an acceptable value according to

Table 4
Correlation between constructs of the TPB model. All correlations significant at 1%-level, construct abbreviations: see Table 3.

	SSN	PBC	MED	PB	MOT	HEAT	INT_G	INT_H
ATT	0.47	0.15	0.31	0.07	0.21	0.01	0.36	0.20
SSN		0.43	0.48	0.20	0.26	0.03	0.56	0.32
PBC			0.31	0.39	0.20	0.01	0.43	0.31
MED				0.13	0.15	−0.03	0.43	0.24
PB					0.24	0.00	0.32	0.16
MOT						−0.03	0.33	0.14
HEAT							0.00	0.17
INT_G								0.42

Chien et al. (2012) and Bamberg et al. (2003). Regarding the structural model, the correlations suggest that subjective & social norms might have a strong influence on the general behavioural intention (INT_G) whereas INT_G is the main explanatory factor for the heat-related change of intention (INT_H).

These results suggest that respondents make clear distinctions between the different factors that influence their intention to visit such summer tourism destinations, providing for internally stable and clearly distinguishable factors for the modelling process. Furthermore, the data confirm the theoretical assumptions by allocating the statements to well-interpretable factors according to the underpinnings of the TPB. However, the factors suggest that changes might be necessary to the proposed core TPB model (see Fig. 2) regarding the integration of social and subjective norm and two types of attitudes.

3.3. Results of the structural equation modelling (SEM) in AMOS

In order to assess the causal relationships between the different core and extended TPB constructs and estimate their influence on people's SRD visit intention, SEM was performed. The final structural model contains all constructs (and underlying items) from the original hypothetical model that showed (1) high factor loadings within the measurement models, (2) significant path coefficients within the structural model, (3) an improvement of the overall model fit indices, and (4) an increase of the explained variance of the behavioural intentions (INT_G and INT_H).

Different model fit indices assessed the fit between the final structural model and the data. χ^2 indicates the difference between the implied and observed covariance matrices and is the base for most other indices such as the normed χ^2/df, which accounts for the complexity of the model (in terms of number of variables). Its value should be below 2.5, indicating a good overall fit of the model. RMSEA, the root mean square error of approximation, controls for sample size and should ideally be below 0.05 or 0.08 (Phetvaroon, 1993, p. 199). The Tucker-Lewis Index (TLI) as a relative index is comparably unaffected by sample size. It corresponds to the ratio between the χ^2 of the default model and the independent model; its value should be above 0.95 (Hu & Bentler, 1995). The goodness-of-fit (GFI) and adjusted GFI refer to the explained amount of variance: In general (GFI) and adjusted by the given degrees of freedoms (AGFI). Both values should be above 0.9 (Lam & Hsu, 2006). Table 5 illustrates the Model Fit values for the final model explaining both INT_G and INT_A, including the optimal range for each indicator as explained above.

Regarding the extensions of Ajzen's original TPB, the study used a stepwise approach to the modelling following the order of constructs in the hypotheses. After adding each new construct, we assessed the influence on the explained variance of the behavioural intention as well as the influence on the overall model fit. Table 6 provides the results of this assessment in order to justify the inclusion of these constructs in the final extended TPB model. The table illustrates that Social Norms (M1) improve the model fit while media coverage (M2), past behaviour (M3) and the motive outdoor sports (M4) improve the explained variance (E.V.) of the general SRD visit intention. The perceived burden of heat (M5) improves the change of behavioural intention under the assumption of heat. Three potential constructs suggested by the factor analysis were not included in the model because they could not improve it by any of the included indicators. These are "attitudes regarding convenience", "travel motive: culture", and "travel motive: relaxation"

Table 5
Model fit values for the final TPB model.

	X^2	X^2/df	RMSEA	TLI	GFI	AGFI
Default model	640,504	1708	0.028	0.975	0.953	0.942
Optimal range		< 2.5	< 0.05	> 0.95	> 0.9	> 0.9

Table 6
Stepwise improvements of the extended TPB model.

Additional Construct	Multiple R² of		Model Fit values	
	INT_G (general)	INT_H (heat-dep.)	X²/df	RMSEA
M0: Core TPB model	0.46	0.26	2.116	0.036
M1: with Social Norms	0.46	0.26	2.043	0.035
M2: with Role of Media	**0.48**	0.26	1.996	0.034
M3: with Past Behaviour	**0.51**	0.26	1.846	0.031
M4: with Motive: Outdoor	**0.54**	0.26	1.817	0.031
M5: with Burden of Heat	0.54	**0.31**	1.708	0.028

(compare Table 3).

Fig. 3 below visualizes the final model for the general SRD visit intention and the heat-related change of intention. It shows both the multiple R² of the behavioural intentions as well as the explanatory power of each of the constructs of the extended TPB model. It becomes visible that the model can explain 54% of the variance in the general behavioural intention to visit SRDs and 31% of the variance in the change of visit intention in case of heat. Appendix 2 shows the critical ratios for each path.

The direct standardized effects of the different constructs on the general behavioural intention to visit SRDs are as follows: 0.06 for attitudes towards these destinations (not significant, p = 0.10), 0.31 for subjective and social norms, 0.12 for perceived behaviour control, 0.18 for media coverage, 0.20 for the travel motive outdoor sports and 0.15 for past behaviour. This means that the combination of social and subjective norms has the strongest influence on the intention to visit SRDs, followed by the travel motive "outdoor sports", past behaviour, a

positive media coverage, and perceived behaviour control.

Concerning the heat-related changes of behavioural intention, we explored various extensions to the model. The only constructs with a significant direct effect on the change of intention caused in case of heat (INT_H) were the general visit intention INT_G with a path coefficient of 0.40, the PBC with a path coefficient of 0.15, and the perceived heat stress with a path coefficient of 0.26.

The overall variance in general behavioural intention (INT_G) explained through the model amounts to 54%. This is a high value compared to other studies in the field of tourism research (Han, 2015, p. 58%; Lam & Hsu, 2006, p. 35%; Quintal et al., 2010: between 21% and 44%). Armitage and Conner (2001) state in their meta-analytical review on several TPB studies that the TPB accounts in average for 39% of the variance in behavioural intention (Chien et al., 2012). The meta-study by Yuzhanin (2016, p. 141) concludes that the TPB could explain "*between 11 and 45 per cent of the variation in the dependent variable (intention) in the analysed studies*", confirming the sound results of this study. Concerning the heat-related change of behavioural intention, the model can only explain 31% of the variance, showing the weaker predictive power of the model when assessing the impact of heat on destination choices.

4. Discussion

4.1. Theoretical implications of the extended TPB model

The following section includes the discussion of the original TPB constructs and those additional constructs with strong explanatory power regarding the intention to visit SRDs in general (INT_G).

Within the present study **behavioural attitudes** have a small and non-significant influence on behavioural intention ($\beta = 0.06$,
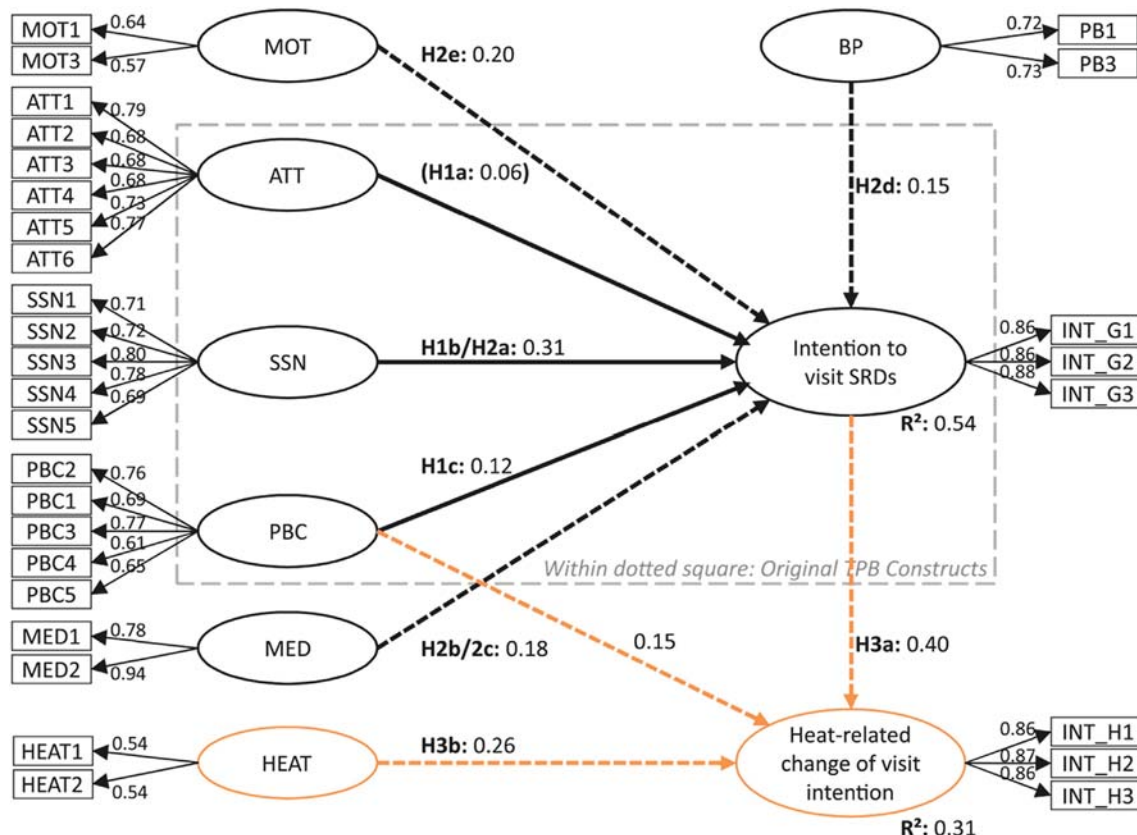

Fig. 3. Results of the structural equation modelling ( ) = path not significant, all other paths: p < 0.01, Dotted square: original TPB model constructs, Dotted lines: extended TPB model components (orange: heat-related model). f) Discussion and implications. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

p = 0.10). This contradicts hypothesis H1a and the main assumptions of Ajzen's TPB (Ajzen, 1991). It also contradicts studies from other fields such as physical activity and transport, within which attitudes tend to be a very influential factor for behavioural intentions (Bamberg et al., 2003; Hagger et al., 2002; Moons & De Pelsmacker, 2015). It goes in line with studies on tourism destination choices suggesting that attitudes may have a controversial role in this context. There are TPB studies on destination choices that find attitudes to have a significant influence on behavioural intention (AL Ziadat, 2015; Chien et al., 2012; C. H. C. Hsu & Huang, 2012). In none of these studies do attitudes appear as the most influential factor. Attitudes often have a very low to non-significant influence in other studies on tourism destination choices (Bianchi et al., 2017: b = 0.05; Lam & Hsu, 2006: not significant; Quintal et al., 2010: b = between 0.02 and 0.19 depending on the country of origin; Sparks & Pan, 2009: not significant). The reasons within the present study could be a generally good perception of SRDs, independently of actual visit intentions. Furthermore, it is possible that the attributes used to determine attitudes were not specific enough, as previously suspected by Yuzhanin (2016).

The results show that among the core elements of the TPB **subjective norms combined with social norms** (covered in H1b and H2a), have the strongest influence on behavioural intention ($\mathscr{B} = 0.31$, p < 0.01). This study can therefore confirm hypothesis H1b. This is in line with other studies on destination choices that highlight the role of subjective norms as the most influential factor (AL Ziadat, 2015: b = 0.47; Bianchi et al., 2017: b = 0.33; Chien et al., 2012: b = 0.23; C. H. C. Hsu & Huang, 2012: b = 0.32; Lam & Hsu, 2006: b = 0.37; Quintal et al., 2010: b = between 0.18 and 0.48 depending on the country of origin). According to Quintal et al. (2010) this large effect may be related to the cultural influence of the social surrounding, which is believed to be particularly high in traditionally more collectivist cultures such as China, Taiwan or Hong Kong.[3] The high relevance in the (more individualist) Austrian context may be related to the large share of people having family or owning second homes in rural areas which they may want to visit regularly.

As described before, **social norms** did not form an independent construct but an addition to subjective norms. The paper can therefore only confirm hypotheses H2a to a limited extent. Social norms influence the intention in a positive way, yet they do not add anything beyond the effect of subjective norms. However, their addition to the model improves the overall model fit. None of the analysed studies on tourism destination choices has added social norm as a TPB extension and the results of this study indicate that this might not be necessary as long as future studies inquire subjective norm in a suitable manner. This would follow Ajzen's plea to strive for as simple a model as possible (Ajzen, 1991). A potential reason for the low influence could be that people do not clearly differentiate between perceived pressure from their social surrounding and the desire to conform to it. TPB surveys are subject to much criticism with respect to their question complexity and adding two rather similar constructs might not help that aspect.

According to the TPB results, the **PBC** has a less strong but significant influence on behavioural intention ($\mathscr{B} = 0.12$, p < 0.01). The results can therefore also confirm the hypothesis H1c, which is in line with the postulations of Ajzen and his model. Compared to subjective norm, the role of PBC in other studies was less clear, although it was significant in most considered studies. In some of them PBC was the strongest influential factor (Bianchi et al., 2017: b = 0.54, for short-haul travellers even 0.60; C. H. C. Hsu & Huang, 2012: b = 0.17; Quintal et al., 2010: b = between 0.26 and 0.32 depending on the country of origen). In others it only played a minor role in explaining the behavioural intention (Lam & Hsu, 2006: b = 0.19). In one study on destination choices its effect was non-significant (Chien et al., 2012:

b = 0.09 with p = 0.059). One potential reason for the smaller relevance in this study is that the destinations within these pre-defined summer retreat destinations are already very accessible to Viennese citizens, especially when owning a car. Compared to travels to countries with different languages, climates or cultural settings, trips to SRDs area are easier to organize and undertake.

Despite the lack of literature on the **role of media coverage** as a predictor for behavioural intention, the construct (covered in H2b and H2c) adds additional explanatory value above attitudes and subjective and social norms. About its position in the model, the results can confirm none of the two original hypotheses: Media coverage displayed the strongest influence on the overall explanatory power of the model when added as a separate construct ($\mathscr{B} = 0.18$, p < 0.01) and not attached to attitudes or subjective and social norms. This is in line with the findings by Sparks and Pan (2009) who highlight the importance of information sources, especially television, as relevant aspect for shaping destination images. The results may also provide an underpinning for other studies discussing the strong relevance of social and conventional media in shaping people's consumption choices. The precise reasons for the importance within destination choices are subject to further research.

The indication of **previous visits to SRDs** (covered in H2d) has a strong influence on the intention to visit them again in the future, beyond the influence of the core TPB constructs and despite the covariance with other constructs ($\mathscr{B} = 0.15$, p < 0.01). The hypothesis can therefore be verified clearly, confirming the findings of other studies highlighting the role of past experience with a destination. In all of the respective studies it is also one of the most influential factors (Chien et al., 2012: b = 0.33; Lam & Hsu, 2006: b = 0.22; Phetvaroon, 1993, p. 199: b = 0.10). This suggests that past behaviour is not fully included in PBC and is a crucial addition to future studies on destination choices. A possible reason for this might be tied to the concept of "familiarity and safety", as discussed by Bianchi et al. (2017) Quintal et al. (2010), and Karl (2018). Especially under some of the grand challenges such as terrorism, climate change and other tourism-impairing factors as well as safety, risk-aversion, and familiarity might increase in importance.

Of three **motive groups** identified within the factor analysis, only one (outdoor sports, covered in H2e) added explanatory power to the model and was therefore integrated ($\mathscr{B} = 0.20$, p < 0.01). This diverges from the practice of other studies such as the one by Chien et al. (2012), who included one construct combining many different travel motives. The effect size, however, turns out to be similar with them obtaining a path coefficient of 0.15. Another study by Lee (2009), despite being a non-TPB structural model, finds that travel motives (again as one combined factor) have a path coefficient of 0.22, similar to the results of this study. Overall, we can conclude that travel motives play a crucial role in determining travel choices. This study, however, remains rather unclear about their precise location within the model on tourism destination choices. Future studies might also consider combining those motives with other pull factors such as specific destination attributes.

The model results of the exploratory analysis show that the general intention to visit SRDs in the future has the largest influence on the **heat-related change of intention** ($\mathscr{B} = 0.40$, p < 0.01). This confirms the hypothesis H3a and highlights that we cannot observe the intention for SRD visits under the effect of increasing independently of the respondent's current behaviour, attitudes, and perceptions. Additionally, the data show that the included variables on perceived heat stress form an acceptable construct with a strong influence on the heat-related change of behavioural intention ($\mathscr{B} = 0.26$, p < 0.01). Adding experienced heat-stress increased the explained variance of the heat-related change of behavioural intention from 26% to 31% (as visible in Table 6). The integration of heat stress into the TPB model confirms the potential impact of heat waves assumed by previous publications (Fleischhacker & Formayer, 2007; Götz et al., 2012; Serquet & Rebetez, 2011; Steiger et al., 2016). The effect of perceived heat stress in the past is an important factor, which can help to identify those guests who might be particularly interested in visiting near-metropolitan areas in

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[3] also see https://www.hofstede-insights.com/product/compare-countries/ for the comparison of countries.

the summer time. Further investigation of this group regarding their travel behaviour characteristics seems necessary and promising for SRDs.

Differing from the original hypotheses, none of the other tested heat-related variables (see chapter 3.3) could increase the model's overall explanatory value. The reasons for this single-focussed influence of heat stress are unclear so far and need further inquiries.

Additional to the hypothesised effects, the model tested the impact of the constructs of the extended TPB model on the heat-related change of intention. The results show that PBC is an additional influential factor. The reasons for this may be that people only feel capable of actively reacting to a stressful situation (such as heat) when possessing the right tools, resources and information. This means that the increase in heat may cause additional distress for some people if they feel helplessly exposed to the situation.

Summarizing the discussion, we can say that despite the criticism mentioned in the literature section the extended TPB model applied in this study explains the intention to visit SRDs in Austria very well. The modelling results also show that travelling is to a large extent a social rather than a purely individual decision. Furthermore, the importance of feeling familiar with a destination becomes visible through the strong influence of both past behaviour and the PBC. This result might be very specific to the chosen study context of summer destinations in close proximity to the source market. They are very suitable for repeated visits. Diminishing barriers of organising and performing those travels should be a priority of the respective destinations. In communicating SRDs, it seems important to use a wide range of media channels since the overall picture and awareness people have of destinations strongly affects their visit intentions. Another insight from the modelling results is the somewhat implicit yet fairly strong influence of past heat stress on the intention to escape from the city in case of future heat waves. While few people consciously stated heat as core travel motive, past heat stress experiences had a strong influence on the intended travel behaviour in case of future heat waves. People are often only aware of the positive refreshing effect of SRDs after experiencing it themselves in case of escaping heat waves. The subsequent section presents implications for destination management against the background of the discussion of hypotheses above.

4.2. Planning implications and potential further research

The influence of heat (in particular experienced heat stress) in combination with the impact of media emphasizes the potential to approach future visitors by seasonal media advertisement in times of heat waves. This weather dependent communication could encourage in particular those who already experienced heat stress in the past. Destinations could communicate the potential for "heat escapes" to SRDs in combination with more activity-based offers (e.g. rafting) or, if relevant, highlight the relaxation-oriented motive bundle. Furthermore, a visitor segmentation on heat-stressed citizens helps to specify the target groups and position the offers in the near-metropolitan areas accordingly. These further investigation according to main motives and other characteristics of target groups seems necessary, as first in-situ research (Steiger et al., 2016) showed diverse weather preferences in combination with activities for different visitor groups. A factor analysis of core-motives is presented and discussed in Juschten et al. (2019) showing three main motives, which are particularly relevant for travels to nearby refreshing destinations close to metropolitan areas: "Sports and outdoor-oriented travellers", "Manifold experiences" -oriented travellers, "Relaxation close to nature"-oriented travellers".

In addition to shaping a profile of future target groups in order to position summer tourism in context of heat and refreshment, the booking behaviour of the heat-stressed citizens could be of particular interest. Krajasits et al. (2008), Serquet and Rebetez (2011) as well as Zellmann and Mayrhofer (2017) show that weather mainly affects spontaneous trips. Consequently, short time weather provisions could influence booking. Further examination of the booking times of travels towards near-metropolitan summer destinations could be helpful in order to increase the influence of shorthand advertisement in response to upcoming heat waves.

The strong influence of the motive "outdoor" in the context of near-metropolitan summer destinations, as investigated by the extended TPB model, confirms the potential to market the natural attractions of these mountainous and/or woody SRDs. The impact of nature experiences and the combination of activities related to it deserve further investigation with regard to different visitor segments. As outlined in Juschten et al. (2019) in a factor analysis of the sample the motive "sport and outdoor-orientation" is very strong in context of SRDs. This is particularly relevant since previous studies such as Pröbstl-Haider et al. (2015) show a stronger response of activity-oriented visitors to changing weather compared to nature oriented visitors of Alpine summer destinations.

Another practical implication refers to the public accessibility of these rural tourism destinations, which are characterized by their location in close proximity to the metropolitan area of Vienna. Vienna displays an increasing share of car-free households, as do many other European capitals (VCÖ Verkehrsclub Österreich, 2017), a potential target group with very specific mobility needs. Given that rural areas are often characterized by low accessibility, this might have implications for people's perceived capability to visit such destinations (as tested by the PBC), especially if they have not been there by public transport before (tested by PB). Both of these influences are strong predictors of intention, which is why further research on this sub-group is necessary to discuss the implications for the destinations' tourism and mobility strategy.

One of the biggest challenges of the SRDs - in contrast to the aforementioned potentials - is the strong impact of social norms. At the beginning of the last century many of the SRDs around Vienna were attractive to Viennese citizens (Schmidt-Lauber, 2014; Zoidl, 2015). However, over the last decades several of them decreased in popularity. Some destinations managed to increase their attraction to daytime visitors in the last few years (in the majority for sport activities) but failed to attract vacationers. Both the lack of offers and infrastructure for a longer stay and the deficiencies in communicating existing offers might be a reason. The image of the destinations could be an additional impeding factor given the importance of social norms and media coverage. Zellmann and Mayrhofer (2015) emphasize the necessity for an experience-driven summer tourism and point out limits to a simple update of traditional summer retreat holidays solely based on nature and touristic infrastructure (e.g. lakes). The strong effects of both subjective norms and media are interesting for further research. It could help to change the image of SRDs and to create and market new experience-driven offers of these destinations. In this context the attractive landscape with diverse characteristics (pre-alpine hilly structure, mountainous areas, large forested areas with small lakes and flat to low hilly vineyard areas) on a low distance from Vienna are a major asset to attract new target groups by encouraging the synergies between remarkable landscape (as a complete contrast to the large metropolitan area) and cultural as well as sportive attractions in a short travel distance. Furthermore, the climatic conditions, which are quite favourable in contrast to the city in summer times, are special for the Viennese surrounding areas due to their mountainous topography but also due to the large forest areas and the variety of climatic zones around Vienna.

Finally, the strong effect of past behaviour on the intention to visit SRDs shows the potential to attract visitors on the long-term. Once metropolitan citizens re-discover SRDs, the likelihood of their return might increase. SRDs should therefore promote themselves as easily and quickly accessible destinations even for people with little travel experience. Against this background, the cooperation of several SRDs is a promising approach to increase the visibility and invite visitors to similar experiences in other SRDs after their first stay. Similarly, a joint-approach to change and communicate the image of Austrian SRDs near

Vienna could be more effective than the current competition under low demand. A positive example in this direction is the lake region in Central Austria ("Salzkammergut") that is internationally recognized for the values of refreshment and innovation of traditional summer holidays.

To summarize, there are new potentials to attract citizens in times of heat stress by offering escape to refreshing areas in a low travel distance. However, quality and image are crucial to convince metropolitan residents of the advantage to plan overnight stays rather than just day trips. In this context the short travel distance is both advantage and challenge, which can only be overcome by positioning these destinations along core travel motives (see also Juschten et al., 2019) and increasing the social recognition as well as the media appearance.

5. Conclusion and outlook

The present study has gone beyond existing research in providing empirical evidence that tourism destination choice intentions towards rural summer destinations are largely influenced by past behaviour, social and subjective norms as well as the image of the destination conveyed in the media. Attitudes on the other hand play a minor role in determining the visit intentions, as suggested by prior studies on destination choices in different geographical contexts. These insights represent a meaningful contribution to existing literature on destination choice intentions in a European context and suitable TPB extensions for this specific type of tourism decision.

Furthermore, the relevance of (presumably increasing) urban heat waves on visit intentions was examined for the first time in a large-scale empirical study, showing that experience with past heat stress and a positive PBC positively influence the intention to visit such destinations in the future. These new insights provide valuable implications to attract heat stressed visitors in the future for refreshing summer destinations in Austria and beyond.

The present study has several research limitations. Firstly, it did not conduct a post-summer survey to investigate the realised tourism behaviour. This would have helped in drawing conclusions on the suitability of the TPB in predicting actual behaviour. This should be addressed in further research to gain more insights into the intention-Behaviour gap with regards to tourism decisions. Secondly, the current study focussed mainly on push factors of travellers, hence intrinsic motivations. As suggested by Chien et al. (2012), the inclusion of

destination-specific pull factors might allow for a more holistic perspective. Thirdly, the survey frequently used the German term "Sommerfrische" to describe SRDs. However, it is likely that respondents have conceptualised it in different ways. Responses might differ depending on whether respondents applied a wider or narrower definition of the term "Sommerfrische".

Concerning the influence of heat, the results suggest that most people are not yet aware of the refreshing character of SRDs. They only believe and appreciate it once somebody else makes them aware of it or once they have experienced it themselves. This represents a promising starting point towards more diversified multi-seasonal tourism strategies for the respective destinations, which can help them decrease their dependency on the increasingly insecure winter tourism. Especially the overall relevance of subjective norms, media coverage, and past experiences represents an interesting starting point for future marketing campaigns that could aim at presenting these destinations as safe, relaxing, and easily accessible escapes from the stress of urban heat. To enrich and specify these results, an in-depth analysis of different customer segments seems necessary for the development of well-targeted tourism offers and marketing strategies.

Appendix

A1 – Descriptive measures for all relevant variables

Construct & Variables	Mean	Standard deviation	Skew-ness	Kurtosis	Excluded from model
1) Attitude (ATT) - Attractiveness					
ATT1 - exciting	0.629	0.251	− 0.219	− 0.427	
ATT6 - diverse	0.672	0.252	− 0.453	− 0.386	
ATT3 - attractive	0.747	0.238	− 0.984	0.907	
ATT5 - unique	0.626	0.249	− 0.391	− 0.169	
ATT2 - appealing	0.751	0.244	− 1.014	0.866	
ATT4 - innovative	0.549	0.262	− 0.041	− 0.47	
ATT7 - sunny	0.714	0.246	− 0.578	− 0.143	X
2) Attitude (ATT) - Convenience					
ATT8 - not crowded	0.669	0.269	− 0.553	− 0.374	X
ATT9 - affordable	0.607	0.250	− 0.175	− 0.462	X
ATT10 - easy to access	0.720	0.244	− 0.707	0.151	X
ATT11 - relaxed	0.824	0.229	− 1.533	2.37	X
ATT12 - safe	0.788	0.232	− 1.152	1.311	X
3) Subjective & Social Norms (SSN)					
SSN1 - SubjN 1	0.507	0.277	− 0.113	− 0.45	
SSN4 - SocialN 1	0.577	0.259	− 0.253	− 0.28	
SSN2 - SubjN 2	0.549	0.281	− 0.234	− 0.442	
SSN3 - SubjN 3	0.591	0.254	− 0.294	− 0.045	
SSN5 - SocialN 2	0.655	0.259	− 0.51	− 0.102	
SSN6 - SocialN 3	0.661	0.240	− 0.442	0.091	X
4) Perceived Behaviour Control (PBC)					

PBC6 - orientation	0.739	0.260	−0.891	0.295	X
PBC2 - no problem	0.730	0.269	−0.847	0.105	
PBC1 - feasible	0.695	0.278	−0.646	−0.288	
PBC3 - easy planning	0.703	0.259	−0.758	0.234	
PBC5 - information	0.739	0.268	−0.929	0.288	
PBC4 - finances	0.670	0.277	−0.509	−0.391	
PBC7 - new places	0.766	0.257	−0.984	0.435	X
5) Role of Media (MED)					
MED1 - positive image	0.595	0.268	−0.431	−0.206	
MED2 - is inviting	0.553	0.278	−0.214	−0.547	
6) Past Behaviour (PB)					
PB1 - nr. of regions	2.250	2.132	1.296	1.955	X
PB2 - nr. of visits	4.160	4.274	1.463	2.174	
PB3 - former visit y/n	0.770	0.418	−1.314	−0.274	
7) Travel Motive – Outdoor Sports (MOT)					
MOT1 - health	0.589	0.287	−0.267	−0.59	X
MOT2 - active	0.506	0.287	0.026	−0.659	
MOT3 - nature	0.747	0.260	−0.851	0.259	
8) Travel Motive – Culture (MOT)					
MOT4 - culture	0.641	0.2643	−0.413	−0.244	X
MOT5 - extraordinary	0.636	0.281	−0.328	−0.608	X
MOT 6 - new people	0.439	0.289	0.307	−0.532	X
MOT7 - culinary	0.665	0.271	−0.542	−0.158	X
9) Travel Motive – Relaxation (MOT)					
MOT8 - relaxing	0.874	0.209	−1.693	2.608	X
MOT9 - good for soul	0.861	0.218	−1.735	3.195	X
10) Perceived heat stress (HEAT)					
HEAT1 - no sleeping	0.450	0.498	0.186	−1.97	
HEAT2 - temp. home	1.220	0.682	−0.307	−0.863	X
HEAT3 - negative	0.460	0.499	0.144	−1.984	
11) Intention general (INT_G)					
INT_G2	0.573	0.343	−0.303	−1.098	
INT_G3	0.625	0.309	−0.517	−0.655	
INT_G1	0.634	0.327	−0.569	−0.752	
12) Heat-related change of visit intention (INT_H)					
INT_H2	0.579	0.206	−0.061	1.258	
INT_H3	0.577	0.205	−0.18	1.377	
INT_H1	0.604	0.212	−0.091	0.874	

A2 – Critical ratios for regression weights

Endogenous variable	Exogenous variable	Estimate	C.R.	P
1) Paths within structure model				
INT_G	SSN	0.452	6.233	***
INT_G	PB	0.141	3.189	0.001
INT_G	MED	0.248	5.043	***
INT_G	PBC	0.166	2.619	0.009
INT_G	ATT	0.087	1.589	0.112
INT_G	MOT	0.335	4.033	***
INT_H	HEAT	0.175	5.021	***
INT_H	INT_G	0.256	9.602	***
INT_H	PBC	0.138	3.673	***
2) Paths within measurement models				
ATT4 - innovative	ATT	0.902	20.131	***
ATT3 - attractive	ATT	0.821	20.002	***
ATT6 - diverse	ATT	0.977	22.874	***
ATT2 - appealing	ATT	0.835	19.343	***
ATT5 - unique	ATT	0.917	21.653	***
ATT1 - exciting	ATT	1.000		
PBC3 - easy planning	PBC	0.988	21.281	***
PBC1 - feasible	PBC	0.951	19.063	***
PBC2 - no problem	PBC	1.000		
SSN3 - SubjN 3	SSN	1.037	21.351	***
SSN2 - SubjN 2	SSN	1.037	22.557	***
SSN1 - SubjN 1	SSN	1.000		
INT_G1	INT_G	1.000		
INT_G2	INT_G	1.046	32.208	***
INT_G3	INT_G	0.965	33.349	***
PBC4 - finances	PBC	0.838	16.756	***
SSN4 - SocialN 1	SSN	1.034	20.931	***
SSN5 - SocialN 2	SSN	0.904	18.586	***
MED2 - is inviting	MED	1.258	19.094	***
MED1 - positive image	MED	1.000		
PBC5 - information	PBC	0.860	18.228	***
PB2 - nr. of visits	PB	10.299	12.806	***
PB3 - former visit y/n	PB	1.000		
INT_H1	INT_H	1.000		

INT_H2	INT_H	0.981	31.336	***
INT_H3	INT_H	0.972	31.221	***
HEAT3 - negative	HEAT	1.000		
HEAT1 - no sleeping	HEAT	1.000		
MOT3 - nature	MOT	1.000		
MOT2 - active	MOT	1.000		

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Paper

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Author's contribution:

The thesis author is the only author of this paper and solely responsible for all its contents.

No car, no travel? Exploring tourism travel strategies of car-free Viennese households

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Abstract: Despite the large share of car-free households in many European cities, little is known about their travel preferences and how they adjust to the lack of car-related flexibility. Most literature only suggests that they either stay home or fly (far) away, while this study focuses on their domestic tourism travel patterns. By using existing qualitative literature on car-free households, this study develops a classification of possible adaptive strategies that is then applied to the urban-rural tourism context. Based on this classification and a quantitative survey on domestic travel patterns of Viennese residents, this paper explores the empirical evidence for five adaptive travel strategies of car-free households for urban-rural tourism trips. These strategies are: i) use alternative transport means, (ii) change travel frequencies and durations, (iii) adjust travel planning procedures, and (iv) choosing destinations accessible to car-free travellers. Strategies (i), (ii) and (iii) are explored using descriptive analysis tools. Assuming that, as part of the strategy (iv), car-free households cluster in particularly suitable destinations, a GIS-based cluster and subsequent hotspot analysis is conducted. It identifies two types of destinations: those, that are mainly visited by car-travellers or those visited by car and car-free travellers alike. By annotating additional transport and tourism data to each of the visited destinations, the two clusters are then described in terms of available transport and tourism infrastructure. The overall results suggest that gaining access to other travel modes (rented/borrow a car or public transport) or choosing particularly suitable destinations (with good transport infrastructure and in-destination walkability) are the most common adaptive strategies. These findings have various planning and policy implications, especially with regard to the need for reducing both the physical and cognitive constraints of car-free travels.

Keywords: car-free households; sustainable tourism mobility; spatial clustering; destination features; exploratory analysis; Austria

1. Introduction

Despite a steady increase in overall road traffic and car registrations across Europe, inhabitants of many large cities are increasingly opting for car-free lifestyles (Haefeli & Arnold, 2015), as illustrated by Table 1. Despite the increase of households without cars, literature on this group is scarce so far. Most existing literature focuses on car-free city or neighbourhood projects (Kushner, 2005; see Nieuwenhuijsen & Khreis, 2016) or on the effects of car-free days or time restrictions on urban accessibility.

Only few, rather recent academic studies focus on car-free households (Brown, 2017; Haefeli & Arnold, 2015; Kühne et al., 2018; Lagrell et al., 2018; Mitra & Saphores, 2017), with the exception of an older study from Germany (Preisendörfer, 2001). Some of these studies distinguish between households not owning a car by choice (*car-free*) or by constraint (*car-less*), a definition that this paper will adopt. Overall, these studies show that car-free living is a phenomenon of urban, well-connected areas (Haefeli & Arnold, 2015; Mitra & Saphores, 2017) with small and young households with fewer children. In addition, more women than men are living a car-free life, which might be affected by both income and a higher affection towards cars among men. Both in the US and in Europe, deliberately car-free households display an above average income, placing them in a post-materialistic, well-educated social class (Brown, 2017; Haefeli & Arnold, 2015; Mitra & Saphores, 2017). In terms of transport modes, car-free households are most often frequent public transport users are more likely to be members of carpooling clubs to increase their personal flexibility (Brown, 2017; Juschten et al., 2017; Kushner, 2005; Mishra et al., 2015).

Table 1: Development of car ownership in some European and North-American cities

Cities	Now (Reference year)		Before (Reference year)		Reference
Vienna	45.0%	2017	41.0%	2013	(VCÖ, 2017)
Hamburg	43.0%	2017	34.0%	2008	German cities:
Berlin	51.0%	2017	41.2%	2008	(infas, 2008, 2018)
Basel	52.1%	2015	45.3%	2000	Swiss cities:
Bern	56.8%	2015	42.2%	2000	(Plattform autofrei /
Geneva	40.9%	2015	30.1%	2000	autoarm wohnen 2017)
Zurich	52.8%	2015	42.2%	2000	
London - greater	43.7%	2017	40.5%	2007	Greater & outer London:
London – inner	59.6%	2017	54.9%	2007	(TfL, 2017)

Compared to leisure trips in urban, well-connected areas, travelling outside the city towards rural areas can impose larger challenges for car-free households. This is particularly true when considering recent trends towards a larger amount of short trips, often conjoined with the desire to combine different motives rather than pursuing one core travel motive (Mahika, 2011; WKÖ, 2016). Especially for visits to rural, nature-based destinations (in Austria and beyond), the car is often the most convenient and time-efficient mode of transportation, sometimes even the only one available, resulting in a strong car dependence of travellers (Allis et al., 2018). Hence, car-free households might need to adapt their tourism travel behaviour or destination choices in different ways. However, most literature at the intersection of tourism and transportation is limited to travel options as gateway to destinations or on-site mobility (Dickinson and Robbins, 2008; Albalate and Fageda, 2016), presenting tourism and transport as rather separate sets of decisions (Van Truong & Shimizu, 2017). Car-free households, however, are restricted not only in their on-site mobility options, but largely also in their overall destination choices since in many rural areas; not having a car creates physical boundaries as to where someone can go within a given time frame.

In response to these research gaps, this study explores empirical evidence indicating how car-free travellers adapt to their lack of flexibility and to the characteristics of the chosen destinations in terms of public accessibility and tourism infrastructure, placing this paper at the nexus of tourism and transport research. Based on a literature review, possible strategies to car-free tourism trips were identified that provide the basis for the exploratory analysis using Viennese tourism survey data from 2017. Since some (rural) Austrian tourism destinations are more accessible by public transport than others, this paper assumes a clustering of car-free tourism travels. A spatial analysis therefore aims at identifying and characterizing the destinations in dependence of their degree of car-free arrivals and on-site mobility. The present study adds to the existing literature by providing empirical evidence to theoretically discussed car-free travel strategies and extending the knowledge on possible mobility strategies to the tourism context. Furthermore, it explores the relationship between spatial destination choices in relation to available transport options for rural destinations.

2. Conceptual Framework

2.1 Car-free accessibility of rural tourism destinations

As outlined by different authors (Dickinson & Robbins, 2008), rural tourism destinations are characterized by several features that favour a strong car dominance: First, they are loosely populated, attractions are dispersed and often far away from public transport (PT) routes. Second, travel motives of nature-based rural destinations frequently require the transport of heavy or bulky equipment (Dickinson & Robbins, 2008) and often seek remoteness over easy accessibility for large groups of people (Boller et al., 2010). Third, trips are not part of a routine and visitors might therefore be unfamiliar with the existing PT system. Therefore, many studies show that car dependency is strong in mostly rural, nature-based tourism sites (Davies & Weston, 2015).

Given the many negative effects associated to strong car-dependence such as noise, air pollution, visual intrusion, safety issues (Dickinson, 2006), and traffic (Connell & Page, 2008), low public accessibility may affect the overall image associated with the destination and its nature (Dickinson & Robbins, 2008). Good accessibility, on the other hand, can strongly enhance the tourist experience and enable growth (see La Rocca, 2015; Van Truong & Shimizu, 2017). The focus on high supply quality and accessibility is even more important when considering that for many tourists, the relationship between their own tourism behaviour and climate change effects is not considered strong enough or the personal benefits of driving by car override concerns about environmental impacts (Becken, 2004; Hall et al., 2015). Especially for short-stay tourism, access by high-speed rail may improve travellers' distance travel capabilities and increase a destination's attractiveness (Van Truong & Shimizu, 2017). In more detail, Litman (Litman, 2018) developed a framework of twelve factors affecting a region's accessibility, including, the overall transport network connectivity, reliability, affordability, available information and mobility substitutes, among others. His work shows that car-free travel can be constrained in different ways, as explained below.

One first constraint for a destination's accessibility is of pure (i) *physical* nature when the preferred or only usable transport mode is not available at a given destination. Another physical constraint refers to the physical (i.e. health- or equipment-related) inability of travellers to use public transit (Lagrell et al., 2018). The available or preferred modes of transport can also impose (ii) *time constraints* if the available transport connections take more time, and are less flexible than travelling by car, while at the same time travellers might be restricted to school holidays (Nyaupane & Andereck, 2008; Rugg, 1973). (iii) *Financial constraints* can occur depending on the family situation and available transport means since travelling by PT can actually be more expensive than by car (Nyaupane & Andereck, 2008; Rugg, 1973). The constraint can also be of (iv) *cognitive* nature when available transport connections seem overly uncomfortable or complicated to plan (i.e. many changes, different booking platforms) or come with other discomforts (i.e. inflexibility, lacking flexibility, anxiety of delays or unexpected problems (Hesselgren & Hasselqvist, 2016; Lagrell et al., 2018)). To provide seamless car-free accessibility, it seems crucial to target more than just the physical constraints but also addressing cognitive and perceived constraints and discomforts related to PT.

The complexity of accessibility is also created by the sequential, multistage nature of transport mode choices for tourism trips (Allis et al., 2018). When making transport mode choices for tourism purposes, travellers need to consider their mobility needs at two stages: for the journey towards and within the destination (La Rocca, 2015; Van Truong & Shimizu, 2017). While both decisions are strongly connected (also to the overall travel motive), they might still be characterized by differing needs, planning horizons and situational aspects. The challenge of on-site mobility mainly lies in the connection of dispersed tourist attractions and accommodations within often not well-defined destination boundaries (Van Truong & Shimizu, 2017). Given these interconnections, both stages will be regarded in the review of possible adaptation strategies for car-free travellers.

2.2 Transport-related constraints and adaptive tourism strategies of car-free households

As stated beforehand, the general tourism behaviour, preferences and car-free travel strategies of car-free households are widely unknown to date. More often, the motives of car users are explored and '*for social-recreational passengers, ease, freedom and pleasure were the most important motives for the car journey experience*' (van Hagen et al., 2012, p. 2). Only the Swedish study by Lagrell et al. (Lagrell et al., 2018) analysed accessibility strategies used by (voluntarily) car-free households to compensate for the car-freeness in their daily lives using in-depth interviews. While not focusing on tourism trips, the study provides valuable insights. First, it shows, that car-free households face a range of different constraints, limiting their possibility to fulfil personal needs in a timely and flexible manner (Lagrell et al., 2018). This corresponds, in a slightly different categorization, to the constraints of accessibility outlined above. Second, people use different strategies to compensate for their car-freeness. It is note-worthy, that respondents stated that the inconvenience of car-freeness increased substantially when planning and performing non-routine leisure and tourism trips, which are the focus of this paper.

Adaptive tourism strategies in response to car-freeness, the core of this paper, are defined as the way individuals adjust their tourism travel patterns to their household capabilities and constraints. While strategies are often defined as a strategic set of measures and decisions, it shall be noted that in this tourism context, they '*rather emerge dynamically from everyday negotiations and decisions in the household*' (Lagrell et al., 2018). The following table lists the strategies identified by Lagrell et al. (Lagrell et al., 2018) as well as Marshall & Banister (Marshall & Banister, 2000) and applies them to the tourism context. The table also shows, which of the travel constraints listed above the respective strategies might be able facilitate.

Table 2: Car-free daily travel strategies based on Lagrell et al. (2018) and their suitability (as rated by the author) to respond to constraints (c.) of car-free travelling. PHYS = physical c., TIME = time c., FIN = financial c., COGN = cognitive c.

Strategy	Adaptation to tourism context	Response to constraints			
		PHYS	TIME	FIN	COGN
choosing activities nearer home	choose destinations nearer home	○	●	●	○
seeking flexible opportunities (e.g. flexible work arrangements)	Be flexible with travel days	○	○	●	○
spending less time on travel-based activities or performing them less often	Travel less often (but stay longer)	○	●	●	○
using alter-mobility (i.e. walking, biking, and PT)	Carpooling, car rental, travelling with friends (by car)	●	●	○/●	●
employing travel/activity coordination and chaining (i.e. performing several activities during the same trip)	Coordination through travel agency or more long-term planning of trips	●	●	○	○/●
redistributing trips and tasks between household members	Order food and other services to tourist accommodation	○	●	○	○
seeking support (through car rides) from one's social network or renting a car elsewhere	Carpooling, car rental, travelling with friends (by car)	●	●	○/●	●
changing communication channels in favour of ICT use and virtual mobility	Not applicable, since tourism requires movement				
ceasing to participate in some activities and engaging in new ones (e.g. spending more time near home)	Travel to destinations closer to home	○	●	●	○

Applied to the tourism context, these adaptation strategies can be subsumed to five types:

1. *Change the travel frequencies and durations*. This could imply to simply not travel at all or travel less but stay longer in order to compensate for longer travel times (Lagrell et al., 2018). This can partly be supported by data showing that car-free households perform fewer and shorter trips both for daily (Haefeli & Arnold, 2015), leisure (Preisendörfer, 2001) and tourism trips (Dellaert et al., 1998).

2. *Change trip planning procedures*. While for daily trips, Lagrell et al. (Lagrell et al., 2018) mention the possibility to coordinate activities among household members and re-structure daily processes, the tourism application may involve more long-term booking horizons, flexible travel days or booking through travel agencies. Especially the latter can function as a replacement for a car since packaged tours often include the transport from the home city. Another possibility to decrease tourists' transport needs are delivery (i.e. food) or pick-up services (i.e. to tourist attractions) at the destination (Hesselgren & Hasselqvist, 2016).

3. *Use of alternative transport means* for the arrival or in-destination mobility. A possible strategy to overcome existing physical (and also cognitive) constraints can be to rent or share a car for either parts of the trip (i.e. specific day trips) or the whole journey. This can either be take place informally by travelling with or borrowing from friends or formally by using rental or carpooling schemes upon availability, both for arrival an in-destination mobility (Hesselgren & Hasselqvist, 2016; Lagrell et al., 2018). At the destination itself, rental systems for different vehicles can help to overcome physical constraints and tackle the fear of travellers to 'get stuck' in the destination, if communicated well in advance.

4. *Choosing different tourism destinations* (Dickinson et al., 2004; Lagrell et al., 2018), which is the special focus of this paper. This can be done in two ways: (i) Travelling mainly to cities or international, less car-dependent destinations (beach resorts, cruises etc.) or (ii) Travelling to destinations that cater to the needs of car-free households. This could be destinations that are either close to Vienna, reachable by high-speed rail or otherwise well-connected. In doing so, car-free households can reduce their travel time and costs, thereby counteracting existing budgetary and time-related constraints. However, physical constraints might remain since certain destinations might not be accessible. The characteristics of such car-free friendly destinations will be one core element of this paper and will be discussed in more detail in the following sub-section.

5. *Shape people's perception of travelling by public transport* from being a burden towards enjoying quality time spent on PT. Hesselgren and Hasselqvist (2016) illustrate in their paper on car-free families that the joy of travelling together by train was a great surprise to the formerly car-using families, enabling them to play games and have relaxed conversations. Other studies also highlight the intrinsic enjoyment of time spent on PT, especially trains (Davies & Weston, 2015; Guiver et al., 2007; Le-Klähn et al., 2014).

2.3 Spatial patterns of tourists with a specific focus on car-free households

Different studies have analysed spatial patterns or clusters of tourism movements, yet no studies could be found that focus specifically on spatial travel patterns of car-free or PT travellers within rural tourism destinations and the related supply characteristics. Many studies on spatial travel patterns have rather focused on determining routing types of tourism travellers (i.e. round trip, single-destination stopover etc.) (Connell & Page, 2008; McKercher & Lew, 2004), or mapping movements within destinations (Caldeira & Kastenholz, 2018; Domènech & Gutiérrez, 2017). However, insights can still be drawn from other studies with regards to influential spatial factors of destinations choices and forms of clustering.

Schirpke et al. (2018) focused on outdoor recreation in the European Alps and showed that tourists have strong preferences for either urban agglomerations (all year round) or remote areas in mountainous regions (strong seasonal variability), depending on the available tourism infrastructure. It illustrates that the Austrian areas with high tourism demand for the motive 'outdoor recreation'

can mainly be found in mountainous areas and little parts around Vienna, despite the supply being much more evenly distributed throughout most of Austria (Schirpke et al., 2018, p. 340). Overall, the study highlights the importance of environmental characteristics (relief types, naturalness), available tourism infrastructure (hiking/cycling paths, accommodations), accessibility, and perceptions (popularity) in fuelling tourism flows. These findings are in line with the results of a study within the Italian and German context, which illustrates that accessibility (by different transport modes) and attractions are the most relevant supply-related destination characteristics (Le-Klähn et al., 2015; Marrocu & Paci, 2012). Therefore, these aspects will be included in this paper's spatial analysis of tourism patterns.

3. Materials and Methods

The following **hypotheses** were guiding the analysis: (i) Despite differences in sociodemographic characteristics, car-free households have the same interest in or attitudes towards rural Austrian tourism destinations but feel less capable of going there. (ii) Caused by the need to adapt to their lack of car-related flexibility, car-free households use one or several of the five presented strategies when visiting these rural Austrian destinations without owning a car. (iii) One adaptation strategy is to specifically visit destinations with mobility and tourism infrastructures catering to the needs of car-free households. This will be done by exploring the empirical evidence to the theoretical strategies outlined in the literature section. Further studies are needed to analyse and discuss the full set of possible adaption strategies in tourism travels, since data only exist for the first four strategies.

3.1 Data sources and relevant variables

The basis for this analysis is a quantitative online tourism survey conducted among 877 Viennese inhabitants between 14 and 69 in summer 2017. Within the sample, 252 respondents (29%) do not own a car, 468 (53%) own one and 157 (18%) own more than one car. The detailed survey design, sampling and conduction process is described in Juschten et al. (2019). To analyse the characteristics of those destinations predominantly visited by car-free households, a combination of the survey data with other data sources was needed. The following data were included in the analysis:
- Household and person characteristics (based on Viennese survey from 2017)
    - o Sociodemographics: age, gender, education, occupation
    - o Household: Income, mobility tools, location, household size and type
    - o Attitudes towards car-free travelling and towards rural destinations
- Mobility features (based on searches in railway and destination websites from 2018)
    - o Regional connectivity (transport connections by different modes at the destination),
    - o Other mobility offers (i.e. carsharing, bike rental, tourist buses, cable cars etc.)
- Tourism supply quality characteristics (based on OpenStreetMap queries from 2019)
    - o Accommodation, attractions, gastronomy & shops, entertainment, trails & tracks

3.2 Analysis of car-free households and their travel patterns

For the analysis of sociodemographic characteristics of car-free households *(hypothesis 1)*, a t-test was performed to analyse the significance of group differences for all relevant variables. The attitudes and intentions towards the visited destinations were then compared using the mean values of the factor scores from a Structural Equation Model developed by Juschten et al. (2019) between the groups of car-free and car-owning households. The following model constructs were compared: (1) general destination-related attitudes, (2) perceived capabilities to go there and (3) resulting visit intentions.

To analyse the evidences for the different adaptive tourism travel strategies outlined in the literature section *(hypothesis 2)*, different descriptive analysis tools were used. They include: displays of frequencies, t-tests for the mean value differences between car-free and car-owning households including p-values for significance of the group differences, and cross tabulations.

In a last analytical step, the spatial clustering of car-free tourists was analysed *(hypothesis 3)*. To do this, the locations of all visited destinations were geocoded and unique destination IDs (dstID) were created. Afterwards, the different destination characteristics I, II and III were annotated using the dstID. To count available tourism infrastructure in a given walking/biking distance, a Service Area Analysis was performed using the Network Analyst extension in ArcGIS. Based on the OSM road network dataset, the service areas within 10, 20, 30 and 60 minutes of walking (at 5km/h) were determined. Using the spatial join, the sum of facilities (i.e. accommodation, attractions) within the service areas was calculated using the time thresholds as weights (i.e. 1/6 for facilities in 60 min walking distance or 1/3 for 30 min distance) to illustrate that closer places are more attractive than the ones further away.

Afterwards, a cluster analysis was performed in SPSS 24 to group destinations based on their respective shares of car-free and car-related arrivals and on-site movements. To determine the ideal number of clusters, a two-step cluster analysis was done using Euclidean distance as distance measure (since all eight variables are continuous). The results provide good cluster quality and suggest the division into three clusters. The actual clustering was then done using k-means cluster analysis for the same eight variables with k=3. The result were three destination groups: (i) destinations of main interest for car-free travellers (n=25), (ii) destinations of main interest for car travellers (n=175), and (iii) destinations of equal interest for both groups (n=112), even though a higher share of people travelled by car (corresponding to the sample mean). Table 3 illustrates the results of the cluster analysis.

Table 3: Results of k-means cluster analysis in SPSS

Variable	Final Cluster centres			ANOVA	
	Cluster 1 (n=25)	Cluster 2 (n=175)	Cluster 3 (n=112)	F value	P value
Arrival: PT used (not exclusively)	.987	.053	.423	431.137	.000
Arrival: PT used exclusively	.973	.016	.287	1179.815	.000
Arrival: car used (not exclusively)	.027	.983	.642	994.333	.000
Arrival: car used exclusively	.027	.983	.669	1083.392	.000
On-site: PT used (not exclusively)	1.000	.999	.954	12.781	.000
On-site: PT used exclusively	.973	.016	.287	1179.815	.000
On-site: car used (not exclusively)	.027	.983	.667	1094.569	.000
On-site: car used exclusively	.027	.981	.616	907.716	.000

In ArcGIS, the clustering of the three different destinations types was investigated using the Kernel density tool and the Hot Spot analysis to retrieve statistically significant hot spots for each separate destination group. In a last step, these destination types were compared with regards to the available transport options and tourism infrastructure using a mean value comparison of all variables in SPSS. The results of this comparison are illustrated in Table 5.

4. Results

4.1 Characteristics of car-free households and their attitudes towards SRD's

The sociodemographic data on car-free households are strongly in line with research previously cited (Brown, 2017; Haefeli & Arnold, 2015; Kühne et al., 2018; Lagrell et al., 2018; Mitra & Saphores, 2017). They show that members of car-free households are younger, more often female and tend to live in smaller households with no or less children. The younger age is also reflected in people's occupation and education: people in car-free households are more often in education and therefore are less often with a finished University degree. Furthermore, people in car-owning households seem to have stronger ties to the countryside, either by having grown up there or owning a secondary residence there. With regards to people's attitudes towards car-free travelling, the differences between the two groups are as expected, yet surprisingly large: car-free households have much more

positive attitudes towards this way of travelling. Yet, when it comes to the accessibility of rural tourism destinations, physical constraints seem to prevail: people from car-owning households find these destinations to be more accessible.

Concerning the interest of both groups to visit these mainly rural destinations, the results show a small difference in both groups' general interest in the destinations. However, they reveal a significantly larger difference in the perceived capability to visit them and the resulting intentions to go there (see Table 4). This shows that car-free households do feel constrained in their travel choices by a destination's accessibility without car. When considering that these perceived capabilities influences people's visit intentions much more than attitudes (see Juschten, Jiricka-Pürrer, et al., 2019 for SEM results), a focus on these constraints and possible strategies to overcome them seems crucial.

4.2 Travelling as a car-free household: possible coping strategies and evidence in the data

This paper analyses four different car-free travel strategies. The overall analysis results are summarized in Table 4 below and discussed separately for each strategy.

Table 4: Strategies of car-free and car-owning households (1&2) as well as car-free travellers (3&4)

Variables	Car-free HH (1)	Car-owning HH (2)	Car-free travellers (3)	Car-using travellers (4)	P value (1) and (2)	P value (3) and (4)
Destination attitudes, PBC and visit intention						
Mean of attitudes	0.576	0.608	0.606	0.610	0.019	0.767
Avg. perceived visit capability	0.600	0.680	0.652	0.708	0.017	0.001
Mean of visit intention	0.565	0.634	0.639	0.674	0.000	0.184
Strategy 1 – Use of transport means						
Arrival by car	45.4%	87.1%	/	100%	0.000	/
Arrival by PT	54.6%	12.9%	100%	/	0.000	/
On-site: walking	71.8%	70.9%	67.8%	72.1%	0.812	0.308
On-site: cycling	21.3%	25.7%	32.2%	22.5%	0.237	0.014
On-site: PT	26.4%	23.6%	46.3%	18.1%	0.187	0.000
On-site: car	29.9%	43.2%	28.9%	42.8%	0.002	0.002
Strategy 2 - Travelling frequencies and durations for rural Austrian destinations						
No visits in the past 2 years	31.0%	19.2%	/	/	0.000	/
1 or more visits in the past 2 years	69.0%	80.8%	100%	100%	0.000	/
Nr. of visits in the past 2 years	3.3	4.5	4.8	5.6	0.000	0.009
SRD: day trips	33.9%	25.5%	27.5%	27.6%	0.034	0.980
SRD: short vacation (1 to 4 days)	49.4%	54.3%	49.4%	54.7%	0.271	0.244
SRD: longer holiday (>4 days)	16.7%	20.2%	23.1%	17.8%	0.309	0.004
day trips p.a.	2,63	2.74	2.97	2.78	0.278	0.834
short vacations (1-4 days) p.a.	1.93	2.15	2.27	2.22	0.013	0.133
longer holidays (>4 days) p.a.	1.57	1.75	1.83	1.78	0.039	0.499
Share low-frequency travellers	33.7%	29.4%	24.3%	28.8%	0.213	0.032
Strategy 3 – Booking time horizons and trip complexity						
Booking: > 4 months in advance	5.2%	9.1%	6,7%	8,5%	0.101	0.483
Booking: 2-4 months in advance	5.2%	12.3%	4.0%	12.3%	0.008	0.004
Booking: 1-2 months in advance	14.9%	16.4%	11.4%	17.4%	0.644	0.081
Booking: 2-4 weeks in advance	21.3%	15.3%	22,8%	15.1%	0.067	0.026
Booking: < 2 weeks in advance	24.1%	20.4%	28.2%	19,4%	0.300	0.021
Booking: Spontaneously	29.3%	26.5%	26,9%	27,4%	0.479	0.901
Trip: A to B, stay in B	62.1%	45.5%	55.0%	48.3%	0,000	0.147
Trip: A to B, daytrips from B	29.9%	40.8%	37.6%	38.1%	0,011	0.907
Trip: Road trip, sev. destinations	5.7%	6.7%	5.4%	6.8%	0,649	0.534

<u>Strategy 1 – Use alternative transport means</u>

The most straight-forward reason to extend one's flexibility when travelling to rural destinations as a car-free household is to get temporal access to a car. This can either be by formally booking a rental or carsharing vehicle or by informally borrowing or sharing one with friends or family. Unfortunately, the survey underlying this paper did not investigate whose vehicle people used for travelling. However, the results suggest that many car-free households strongly rely on rented, borrowed or shared cars for their trips to rural destinations since 45% of travellers from car-free household arrived by car without owning one. The figures on their daily mobility also confirm their temporal access to either formal or informal car rentals: 35.7% of car-free households use a car 'rarely' or 'sometimes' in their daily mobility in Vienna. On the other hand, the results also show that car ownership doesn't inevitably lead to car usage; 13% of people in car-owning households arrived at their destination by PT. As a result, the following analyses will not only focus on car-free households but also on those arriving at the destination without a car (independently of ownership status), since they face the same structural constraints.

The analysis shows that on-site mobility is much more diverse and includes many different transport modes. Surprisingly, only 43% of those households arriving by car will actually use it once at the destination. Yet, for arrival, it provides greater accessibility and flexibility and reduces the dependence on insecure mobility options within the destination.

<u>Strategy 2 – Change travel frequencies and durations</u>

Changing travel frequencies and durations represents another option to adjust travel behaviour and could be framed in two ways: car-free households could either not travel at all or travel less but stay longer. When looking at evidence from the data (see Table 4), we can indeed find a larger share of car-free households that has not visited a rural Austrian destination in the last two years (31.0% vs. 19.2%).

When analysing the general travel behaviour (domestic and international), the differences between the two groups are not as significant. To determine whether not travelling at all is a frequent behaviour, we calculated the share of people in each group who are 'low-frequency travellers' (defined as less than one or no trip per year) in at least one of the three trip categories (day trip, short or long holiday). The share of low-frequency travellers is only a little higher in the group of car-free households (33.7% vs. 29.4%) and the difference is not significant. However, in the group of car-free travellers, the share of low-frequency travellers is significantly lower, suggesting that they are rather experienced with the use of PT offers to non-rural destinations. To conclude, only few car-free people decide or are forced to never travel, they just seem to visit other places than rural Austrian destinations for their trips. This could for example include international, less car-dependent destinations (such as city trips or beach resorts). This assumption can be strengthened by research showing that people in car-free housing districts in Vienna have higher air transport emissions (Kühne et al., 2018; Ornetzeder et al., 2008). Yet, to analyse the group's overall travel preferences would exceed the frame of this paper, which focuses specifically on the car-free accessibility and attractiveness of (mainly rural) Austrian destination.

Overall, people in car-owning households are more mobile. Both in terms of general travels and those to rural Austrian destinations, they display a higher number of visits. This paves the way for the second hypothesis: car-free households might travel less but stay longer to compensate for longer travel times. The data are, unfortunately, not detailed enough to analyse this. The results indicate that car-free *households* perform an above average amount of day trips, hence particularly short durations. When looking at car-free *travellers* instead, we can observe the behaviour as assumed: they do significantly more long-term vacations. The problem with these data, however, is the pre-categorization of trip lengths, which contains no precise information on the actual trip length.

<u>Strategy 3 – Adjust travel planning procedures</u>

Two possible strategies regarding trip planning procedures are to plan trips longer in advance to avoid increasing prices and choose days with the best price performance ratio, to plan less complex trips or to book (packaged) tours with travel agencies to evade the physical and cognitive constraints of PT trip to certain destinations. With regards to the spontaneity of travel planning, the results are

very surprising. Against the assumption, it becomes visible that not owning a car does not automatically relate to more ahead-planning. While 37.8% of car-owners plan their trips more than a month ahead, only 25.3% of car-free households do so. To make sure the results are not corrupted by those car-free households that used a car for their trip, we added the data of people travelling to their indicated destination with or without a car. By doing this, we can see that the booking horizon for this group is even shorter, suggesting that longer planning horizons are no frequently used adaptive strategy neither of car-free households nor car-free travellers.

Regarding the trip complexity, the data show the car dependence and limited flexibility of inter-regional mobility within rural areas, imposing both physical and cognitive constraints to car-free travellers. As a result, car-free households and travellers most often travel to their destination and stay within the proximity of it. Car-owners on the other hand use their car-derived flexibility to perform additional day trips starting from their destination.

This lack of inter-regional mobility could be counteracted by booking pre-packaged roundtrip tours. When looking at the booking preferences, the data show that car-free households most often choose to book their trips online (60.0%) or directly at the accommodation (52.4%). Diverging from the assumption, booking through travel agencies (i.e. to book car-independent tours) is even less popular among car-free households than among car-owning ones (24.2% vs. 31.5%). We can therefore conclude, that car-free households are not necessarily willing to give up their personal flexibility when travelling to such rural Austrian destinations, even if that limits the scope of accessible destinations, attractions and services.

4.3 Analysing spatial and destination characteristics of car-freely reached destinations

Strategy 4 – Choosing destinations accessible to car-free travellers

Table 5 illustrates the characteristics of the two statistically significant cluster groups (2 and 3). It shows that the destination where car-free travellers go do not contain the largest but clearly the most well-connected tourism sites (by nearly all transport modes: for arrival and on-site mobility). Their availability of on-site mobility features is above average for nearly all included on-site mobility and destination features. They are visited by car and PT alike, illustrating their high touristic value for all people paired with a good public accessibility for PT-affine travellers. This group seems to display the highest potential for mode shifts due to their good connectivity and existing attractiveness to car-free travellers.

Table 5: Characteristics of the destinations within the two significant cluster groups
Mob = Mobility options, Tour = Tourism infrastructure, Source: Author

Variable	Cluster 2 'Car' (n=175)	Cluster 3 'Car and Car-free' (n=112)
Inhabitants	15868	10634
# daily Railjet connections	3.52	5.41
# daily regional train connections	31.99	36.65
# daily bus connections	90.4	103.0
# daily on-demand bus connections	0.35	1.19
Nr. of daily boat connections	0.66	1.23
Sum of daily transport connections	127	147
Mob: carsharing (y/n)	0.20	0.17
Mob: special buses (y/n)	0.21	0.24
Mob: bike rental (y/n)	0.59	0.62
Mob: hotel shuttles (y/n)	0.50	0.55
Mob: Boats (y/n)	0.12	0.20
Mob: Fun vehicles (y/n)	0.39	0.37
Tour: tourism office (y/n)	0.65	0.62
Tour: online mobility information (y/n)	0.17	0.26

Tour: tourism card (y/n)	0.08	0.12
Tour: in mountainous area (y/n)	0.66	0.71
Tour: nr. of accommodation options	3.5	5.1
Tour: nr. of tourism attractions	3.6	5.8
Tour: nr. of gastronomy options	8.5	14.8
Tour: nr. of supermarkets	2.3	3.2
Tour: Sum of mtb/hiking routes in km	16.5	17.3

The following maps illustrate the frequencies of visits within the different cluster groups (based on the Kernel density and Hot Spot Analysis in ArcGIS). It shows that there are varying concentrations of travellers depending on the transport mode they used. Car-using travellers cluster in the areas of Gmunden, Bad Aussee (both mountainous areas), the Waldviertel and Lake Neusiedl (flat area close to Vienna). Areas equally visited by both groups can be found in the 'Salzburger Land' (mountainous areas) and other destinations within the mountainous areas of the Viennese Voralpen as well as Lake Neusiedl, all well-connected by public transit. Hence, in terms of spatial clustering, we can observe no obvious difference in terms of tourism portfolio but mainly with regards to PT accessibility.
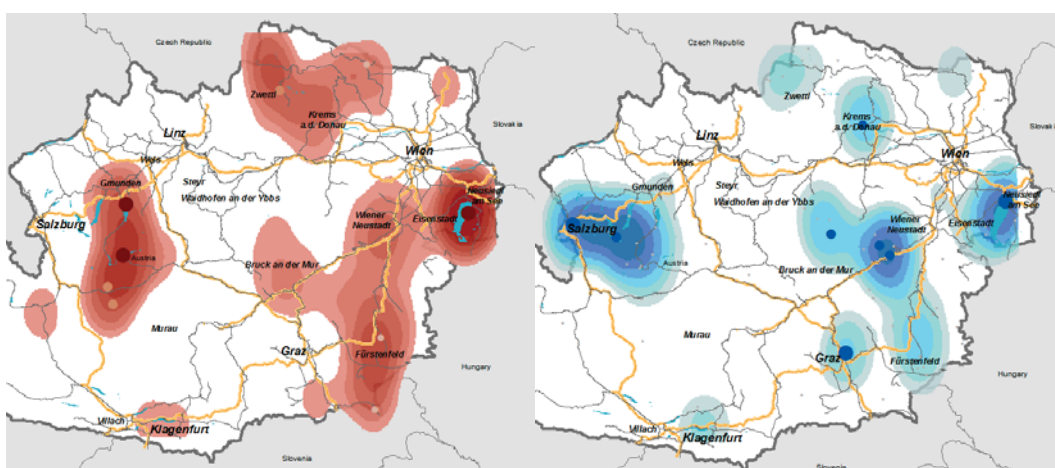

Figure 1: Geographical hot spots of car-affine and car-free-friendly destination clusters

5. Discussion and Conclusion

This paper investigated different travel options of car-free households and travellers for trips towards rural tourism destinations in Austria. Using different descriptive, cluster and spatial analysis tools, the study tried to explore the practices of car-free travellers. Subsequently, the identified travel patterns and their academic and planning implications are discussed.

Summary of results and conclusions

This analysis reveals a number of findings related to different adaptive strategies for car-free households or travellers in the tourism context. First, the analysis shows that car-free households feel more constrained in their ability to travel to rural Austrian destinations than their car-owning counterparts. Considering the large influence of perceived behaviour control on travel choices, as identified in previous research (Bianchi et al., 2017; Hsu & Huang, 2012; Juschten, Jiricka-Pürrer, et al., 2019; Quintal et al., 2010), these results highlight the need for making PT the easier, cheaper, more beneficial and therefore more obvious choice when trying to reduce car usage in rural destinations.

Second, the findings suggest that car-free households do adjust their travel patterns. In terms of transport modes, 45% still reach their chosen destination by car, despite their positive attitudes and predisposition towards car alternatives. Since only about half of the people arriving by car still use it at the destination, this propounds that many of the desired destinations are not sufficiently accessible by PT. This could refer to both the general accessibility, the need for transporting bulky equipment

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(i.e. surf boards, climbing gear) or that it represents a guarantee for precluding the risk for being stuck at the destination. Surely, the convenience and comfort of cars also attracts car-free households, but the author assumes this effect to be less strong for since car usage is much less habitual for them (Haefeli & Arnold, 2015).

Third, car-free households travel less frequently, which matches prior findings (Guiver et al., 2007). However, the car-free households that do travel, are very active travellers and presumably very experienced with using PT in different places. Also, members of car-free households seem to travel more often internationally and by plane than people owning cars, a re-occurring finding questioning the proclaimed sustainability of car-free living (Ornetzeder et al., 2008; Ottelin et al., 2014). While this might be a pure 'matter of interest' from the part of the younger and more mobile generation, it could also be the manifestation of a structural problem of many rural destinations that cater predominantly to car-bound travellers, thereby creating a rebound effect (Czepkiewicz et al., 2018).

Third, the analysis of planning horizons did, against expectation, not reveal any relevant results. Car-free households or travellers do not display longer planning horizons. This may be attributed to the fact that car-free households are on average younger and have fewer kids, allowing them to travel more spontaneously. The younger age and desire for spontaneity and flexibility might also explain why pre-packaged tours are not seen as an interesting alternative even though they would allow travellers to combine locations which they are currently not able to reach by PT.

Fourth, car-free household members travel to different places. This is in line with a study from a national park in the UK where most bus users where car-free households and they indicated that without the PT service, they would have visited a different destination (Guiver et al., 2007). Also, our analysis reveals varying concentrations of travellers depending on the transport mode they used. Compared to car-dependent destinations, those visited by both groups alike display the densest transport (as well as tourism) infrastructure, suggesting they are of high touristic interest for all as well as easily-accessible and with a higher degree of walkability. This shows the importance of good transport and local tourism infrastructure when aiming to attract PT users (LaMondia et al., 2010; Le-Klähn et al., 2015).

Planning implications in response to constraints of car-free travelling

Overall, the exploration of travel strategies illustrates the difficulty of visiting rural destinations without a car. Car-free households or travellers appear to have similar overall travel preferences but are much more dependent on transport and in-destination infrastructures. On top of these infrastructural barriers, car-free travellers face more complicated trip planning procedures and the fear of being 'stuck', which can only be solved by few of the strategies illustrated in Table2. Since this has a large influence on travel intentions (see Juschten, Jiricka-Pürrer, et al., 2019), destinations should aim at facilitating the respective adaptive travel strategies by enhancing access to alternative transport modes, by increasing in-destination walkability or by offering flexible services with reduced planning needs.

While the results from this study refer to Austrian rural tourism destinations, other rural destinations in Europe are equally car-dominated and have used various strategies to reduce this dependency (Davies & Weston, 2015; Dickinson & Robbins, 2008). Available measures include shuttle buses (often used in national parks), scheduled or on-demand bus systems for mixed use between tourists and locals, luggage transport organized by railway carriers, information provision from the part of destination management organizations, pick-up arranged by accommodation or tourist attraction providers (Guiver et al., 2007; Holding, 2001; Lumsdon et al., 2006). Destinations can also implement strict entry rules, as done by some destinations, for which car-freeness represents a unique selling point that aims to increase travellers' overall satisfaction with the visit (Holding, 2001; Niederer Sussanne; Walser, Roger, 2014). This list could be continued, however, what it aims to show is that car-free accessibility needs to involve the cooperation of stakeholders along the entire trip planning and conduction chain at various administrative and spatial levels (Bricker, 2017). Given

that transport mode decisions are made at different points in time, timely information provision is key (Allis et al., 2018).

A well-thought through mobility and service supply catering different needs (i.e. families with children, travellers with activity-specific bulky equipment, older travellers etc.) might reduce the perceived risk. Such offers need to be accompanied by comprehensive, up-to-date and well-designed information packages (digital or print), also from the part of the accommodation and tourist service providers (Allis et al., 2018). Especially the target group of young urban residents are experienced users of PT and new information technologies or different forms of on-demand/shared mobility services. They are therefore particularly receptible to new mobility offers and respective campaigns.

The amount of people in the sample renting or borrowing cars from friends for their trips suggests that there is a big market for new innovations or business model in the field of flexible ride- or carsharing towards or within tourism destinations. A study by Dickinson et al. (Dickinson et al., 2017, 2018) illustrates different tourism-related scenarios (lift share for activities and shopping collection) for which this represents an alternative. They emphasize though, that the design of such services (or apps) should emphasize on building trust in the system (i.e. through rating systems) and reduce people's feeling of indebtedness to for higher acceptance.

While being associated with 'promotional trips for the elderly' in Austria, hop-on hop-off coach travels are more successful, especially among younger travels, in other countries such as New Zealand (Allis et al., 2018; Becken, 2005). Such options and the relevant need for target group-specific marketing and business model could also be reviewed in Austria. However, this option ought to be chosen with care. Many, especially nature-oriented travellers, seek flexible, individual and possibly remote travel experiences (see tourism motives of this sample group in Juschten, Brandenburg, et al., 2019) that are partly incompatible with common target groups of tour-based group travels (see groups identified in Atout France, 2016). This possible mismatch of motivations shall be considered when planning such services. In that context, individuality, authenticity, and originality in their choice of destinations and arrangement of the trip itself may be important service features.

A last important aspect is the walkability of destinations, which clearly reduces the reliance on any other form of transport, therefore also targeting cognitive (and other) constraints. Previous research measuring the walkability of destinations mainly focused on urban settings (Hall & Ram, 2019), but the concept is also relevant in rural settings, despite being more difficult to implement. It aims at reducing the distance between relevant services and tourist amenities (i.e. shops, attractions, hiking trails) while improving the quality and safety of the respective passages. Further research may investigate the relevant types of amenities from a tourist perspective to explore suitable walking paths, which could in themselves be designed as tourist attractions, in different rural destinations.

Conclusions, limitations and further research

The analysis of possible travel strategies of car-free households and travellers shows that gaining access to other travel modes (rented/borrow car or PT) or choosing particularly suitable destinations are the most common adaptive strategies. When travelling by PT, available transport infrastructure in the destination seems to be a crucial factor influencing destination choice. The present study, while showing the distribution of in-destination transport and tourism infrastructure among the two destination clusters, cannot provide answers as to which supply criterion actually drives destination or mode choices (Allis et al., 2018; LaMondia et al., 2010). Further studies could use more enhanced data (especially regarding attributes of available travel modes) and inferential models to investigate the factors that could encourage people to choose car-free destinations. The inclusion of service quality features and ease of planning aspects seems relevant in the light of the findings of this study. Further studies could also investigate the adaptation strategies that were disregarded in this paper for reasons of lacking data availability.

Another data limitation refers to the voluntariness of car-freeness within the dataset. This information is not included in the data and we can, therefore, not distinguish between the strategies of voluntarily versus forced car-free (or car-less) households. It is noteworthy, however, that this study refers to the urban and European context, where cars are (usually) no prerequisite for

employment, social life, crucial services and societal participation compared to more car-dependent cultures (see Brown, 2017; Fitzgerald, 2012; Kühne et al., 2018).

The data quality of the survey data represents the strongest limitation since the survey's destination data only contained the name of the town or village but no specific address and no further information on movements within the destination. More precise destination data would allow for more enhanced analyses of tourists' movements (and possibly reveal other relevant adaptation strategies). Especially GPS data tracking precise movements within destinations could provide further information on tourism network structures and the factors driving people to choose the respective destination (Taczanowska et al., 2017).

Despite these limitations, the paper makes various academic and practical contributions. **Theory:** First, it suggests a classification of possible adaptive strategies for car-free households or travellers in the tourism context was developed based on literature on travel constraints and strategies. This set of five strategies can serve as a guideline for further studies with a similar focus. Second, this study provides insights into possible travel strategies of car-free households and travels in response to the constraints induced by the lacking car ownership. **Methodology:** The paper uses network analysis tools in GIS to characterize destinations visited by survey respondents. Such data annotation methods might provide interesting insights in various tourism contexts. **Policy and Planning:** this study provides policy-makers and destination managers with a clearer understanding of the needs of car-free travellers, which helps them design suitable tourism and mobility services.

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Paper

Author's contribution:

The thesis author is the main contributing author. Her roles included the conception of the paper, some of the data mining processes as well as the writing of the following sections: Introduction, determinants of mode and destination choice, conceptual methodology parts, parts of the descriptive results and most modelling results as well as the discussion.

RH is the second author. His roles included the overall data management, preparation and conduction of the modelling procedures in R with the related output of tables and figures as well as the write-up of the modelling-related methodology parts and some of the descriptive results. He also contributed substantially to the structure and content of the discussion.

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Out of the city – but how and where? A mode-destination choice model for urban–rural tourism trips in Austria

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ABSTRACT

Rural tourism is dominated by car travel. To attract tourists and facilitate a modal shift, a greater understanding is needed on the factors driving tourist decisions. This paper examines destination and transport mode choices as a combined choice in the context of urban–rural tourism in Austria. To do this, this article explores two different model structures, ultimately using a multinomial logit model, which is rooted in the random utility theory. The analysed data are based on a large tourism survey, with additional trip and destination characteristics annotated later on to allow for the anticipated focus on supply-side factors. The results show that (1) destination and transport mode choices are intertwined decisions, (2) car and public transport (PT) travellers perceive travel time and distance differently, (3) a high-quality web presence is the strongest destination attractor, (4) walkability facilitates both destination and public transport attractiveness, and (5) daily and tourist mobility are connected through underlying mobility cultures. These results have various policy and planning implications, especially for destination attempting to transition towards more sustainable tourism futures by means of new transport or tourism offers or social marketing measures targeting both tourists with their personal values and practices as well as tourism-related institutions.

Introduction

In many European cities, urban residents regularly use public transport (PT) or active modes (cycling, walking) for both their daily commuting and leisure trips (Fiorello et al., 2016). Research on tourism behaviour suggests, however, that city dwellers' transport mode preferences change when aiming for rural destinations (Le-Klähn & Hall, 2015). As a result of these practices, the car is responsible for 69.6% of all European transport-related emissions from domestic tourism (UNWTO & ITF, 2019, p. 41). On a global scale, research estimates that transport is responsible for three-quarters of all tourism-related emissions (Cavallaro et al., 2017; Scott et al., 2016), accounting for 5% of all global emissions (UNWTO & ITF, 2019). In the light of growing debates on climate change and both tourism as well as transport-related emission policies in the EU, the reliance on cars in rural tourism destinations represents a threat to the goal of sustainable tourism futures. Considering that most rural destinations' tourism portfolio is strongly tied to the enjoyment of nature (Woods, 2011), the development of sustainable transport alternatives becomes even more relevant.

Despite the challenges linked to establishing attractive PT infrastructure in rural areas (Le-Klähn & Hall, 2015), there are attempts from the part of rural tourism destinations to improve their car-free accessibility (Holding, 2001). For some destinations 'soft mobility' and car-free alternatives have

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even become a unique selling point that shapes parts of the destinations' overall tourism portfolio (Danube Competence Center, 2014; Scuttari et al., 2013). To support this process and offer attractive car alternatives, it seems crucial to understand in greater detail the relationships between and influences on destination and transport mode choices. Our key interest in this analysis is to understand why urban travellers – despite their predisposition for public transport opt for the car when visiting rural areas and which destination and PT features influence their choices. Using Austria as a case study, we analyse this for leisure-related trips from PT-affine Vienna (for its modal split see Buehler et al., 2017) to a wide range of rural, predominantly nature-based domestic tourism destinations (subsequently called 'urban–rural tourism'). Compared to destination-centred observations, the focus on Viennese travellers provides insights into the full set of available alternatives for domestic tourism near Vienna and the respective characteristics of these destinations.

Modelling tourism-related mode and destination choices

Much previous research has investigated people's tourism behaviour, both in terms of destination and transport mode choices. Such studies are often based on either (i) economic theories largely analysing objective attributes of the decision-maker and available choice alternatives or (ii) behavioural or psychological theories, which focus on the role of habit, attitudes, values or norms in explaining individual behaviour (for an overview, see Lanzini & Khan, 2017; Sirakaya & Woodside, 2005). For transport mode choices, personal, households and PT/car trip characteristics are frequently investigated influence factors (e.g. Gross & Grimm, 2018, p. 405; Hall et al., 2017; Le-Klähn & Hall, 2015), whereas for destination choices destination-specific supply-side determinants are a stronger focus (e.g. Marcussen, 2011; Marrocu & Paci, 2012). By using different types of economic (often discrete choice-based) or psychological models, previous studies on tourism mobility have investigated arrival trips from tourists' residential location to the destinations (Thrane, 2015), in-destination mobility (Gronau, 2017; Gross & Grimm, 2018; Gutiérrez & Miravet, 2016; Le-Klähn et al., 2015) or intra-destination mobility (Masiero & Zoltan, 2013). Destination choices on the other hand have been analysed in abundance, covering all geographical scales and contexts and using various qualitative, or quantitative approaches rooted in economic, geographical or behavioural models (Ho & Mulley, 2013; Sirakaya & Woodside, 2005).

There is, however, only little research that looks at tourism destination and mode choice in a combined, interlinked manner to understand how these two decisions influence each other and how they are both affected by different supply and demand-side factors (LaMondia et al., 2010). Past studies (LaMondia et al., 2010; Le-Klähn et al., 2015; Masiero & Zoltan, 2013) have made attempts to understand the relationship between both choices in a tourism context. The study by LaMondia et al. (2010) does this for travellers within the EU, but only covers a small set of highly disaggregate destination alternatives (six countries) and without data on trip-specific attributes. Le-Klähn et al. (2015) and Masiero and Zoltan (2013) both modelled destination choice as a binary choice, therefore providing little insights into the destination-specific determinants of different spatial decisions.

Table 1 presents a summary of some crucial studies quantitatively modelling tourism-related mode choices, destination choices or both combined. It illustrates their different research foci, spatial contexts, methodological approaches und data sources.

Contribution of the chosen approach in relation to previous work

Table 1 illustrates the uniqueness of this paper in terms of spatial context, modelling approach and available data in relation to previous studies. For the still under-researched context of urban–rural tourism, this paper combines tourism-related destination and transport mode choice in an integrated multinomial logit model. While previous studies used bivariate probit models for categories of destinations (see Le-Klähn et al., 2015; Masiero & Zoltan, 2013), this approach allows to integrate spatially-specific destination choices (and their respective destination features). For this purpose,

Table 1. Foci of previous tourism research on separate or combined models of transport mode and destination choices covered in the literature section.

Authors, year	Mode choice	Destination choice	Spatial context	Analytical techniques	Data	Attribute groups
Only mode choice (arrival – arr, on-site – dst or both)						
Gross & Grimm, 2018	Yes (both)	No	Diverse (all of Germany)	Chi-square & Kruskal–Wallis *H*-test	RA survey data* (*N* = 1649 pers.)	1, 3
Gutiérrez & Miravet, 2016	Yes (both)	No	Small urban (Spain, coast)	Multinomial Logit model	survey data (*N* = 4336 pers.)	1, 3, (5)
Kelly et al., 2007	Yes (arr)	No	Urban to rural (Canada)	Nested multinomial logit	survey data (*N* = 876 pers.)	1, 2, 3, 4
Lumsdon et al., 2006	Yes (arr)	No	Rural (Great Britain)	Regression models	survey data (*N* = 1261 pers.)	1, 2, 4
Thrane, 2015	Yes (arr)	No	Diverse (Norway)	Multinomial logit model	survey data (*N* = 2139 pers.)	1, 2, 3, 4
Only destination choice						
Marcussen, 2011	No	100+ countries	Diverse (all of Germany)	Regression models	EU survey data* (*N* = 37,579 trips)	1, 3, 5
Marrocu & Paci, 2012	No	107 provinces	Diverse (all of Italy)	Spatial interaction model	Aggregate tourism data*	1, 4, 5
Mutinda & Mayaka, 2012	No	33 national parks	Diverse (Kenya)	Factor analysis	Survey data (*N* = 118 pers.)	1, 2, 5
van Middelkoop et al., 2003	No	8 NL regions, 11 international	Diverse (NL, Europe, all)	Rule-based model	NL survey data* (*N* = 7121 trips)	1, 3
Delaplace et al., 2014	No	2 cities	Urban (Paris, Rome)	Regression models	Survey data (*N* = 378 pers.)	1, 2, 3, 4
Combined mode and destination choice						
LaMondia et al., 2010	Yes (arr)	6 countries	National (EU countries)	Multinomial logit model	EU survey data* (*N* = 2298 trips), destination data	1, 2, 3, 5
Le-Klähn et al., 2015	Yes (arr)	Periurban yes/no	(Peri-)urban (Munich)	Bivariate probit model	Survey data (*N* = 474 pers.)	1, 2, 3, 4
Masiero & Zoltan, 2013	Yes (dst)	One or more visited dst	Mainly rural (Switzerland)	Bivariate probit model	Survey data (*N* = 629 pers.)	1, 2, 3
Present study	Yes (arr)	295 destinations	Urban to rural (Austria)	Multinomial logit model	Survey data (*N* = 695 trips), destination data	1, 2, 3, 4, 5

Note: * marks usage of secondary datasets not specifically compiled for that specific study, dst = destinations.
Attribute groups: 1 = person and household characteristics, 2 = travel motivations, 3 = situational characteristics, 4 = attributes of car and PT trips, 5 = destination features.

Table 2. Number of candidate variables, variables used in the final model and data sources.

Determinant dimensions and variables	# candidate variables	# used variables in model	Source
Person and household characteristics			
income, location, heat exposure	30	0	Viennese survey
gender, age, education, travel patterns	109	0	
mobility tools: cars, bikes, PT reduction cards	13	2	
Travel motivations			
i.e. relaxing, sports, time with family, escape the city	20	0	Viennese survey
Situational characteristics			
i.e. trip duration, travel party, chosen accommodation	126	2	Viennese survey
Attributes of car and PT trips			
travel time, changes, service intervals, PT category etc.	21	4	VAO
Destination features			
mobility offers (i.e. bike rental, carsharing)	11	7	Manual search
connectivity by bus and train within the region	6	0	'Scotty' (ÖBB)
tourism facilities in 60-minute walking distance (accommodation, gastronomy, shops, attractions, trails)	5	1	OSM queries, spatial join in GIS

data from different sources (Traffic information Austria (VAO), OpenStreetMap and ÖBB Scotty; see Table 2 and the methodology section for a detailed list of generated data) were merged with the self-reported destination and mode choice survey data of Viennese travellers. In doing so, we could account for travellers' personal data, travel motivations, situational aspects, PT and car trip characteristics as well as the tourism (i.e. accommodation, attractions) and transport infrastructure (i.e. PT service quality) in the destinations, thus creating a unique, rich and disaggregate data source for the model. Based on these results, the paper aims to discuss how destinations and public transport providers can motivate urban residents to use PT for their travels towards rural destinations.

Determinants of tourism destination and transport mode choice

The following section discusses possible determinants for destination and mode choice in the context of urban–rural tourism or leisure trips. This context is characterized by (i) non-habitual, leisure-oriented destination choices, (ii) mode choices for non-habitual long-distance trips (Le-Klähn & Hall, 2015); (iii) a rural, loosely populated geographical context with often poor transport infrastructure, as well as (iv) unevenly distributed or scattered points of interest. This section on choice determinants is structured along the predominantly objective categories used by Kelly et al. (2007) and Le-Klähn et al. (2015), given the study focus on supply-side data (compare Gross & Grimm, 2018 for alternative classifications). It includes: (1) personal and household characteristics of the traveller, (2) travel motivations, (3) situational characteristics of urban–rural leisure trips, (4) attributes of car and PT trips, and (5) destination features. The data used for this study originate from a comprehensive survey containing most of the variables from categories 1–3. Data for categories 4 and 5 were annotated using external sources.

Person and household characteristics

The influence of sociodemographic variables (age, gender, income, education, etc.), mobility tools as well as socio-psychological factors (values, attitudes and preferences) have been the focal point of many empirical studies on tourism destination and transport mode choices (Le-Klähn & Hall, 2015). More often than not, the resulting models are strongly defined by the subjective factors, while sociodemographic determinants turned out to have less influence on destination choices (Le-Klähn et al., 2015; Masiero & Zoltan, 2013) or mode choices (Kelly et al., 2007; Lumsdon et al., 2006). This is contested by other studies who identified income or gender as strong predictors of destination choices (in Italy: Marrocu & Paci, 2012) or PT usage (in Spain: Gutiérrez & Miravet, 2016; for an overview of other studies see Gross & Grimm, 2018). Other studies have identified age as a positive factor for PT usage in rural areas, which they attribute to older people's reluctance to drive in unfamiliar places (Guiver et al., 2007; Le-Klähn et al., 2015).

More psychological choice determinants (i.e. behavioural attitudes, norms, emotions, motivations) are frequently studied choice factors (Anable & Gatersleben, 2005; Hsu & Huang, 2012), with environmental values increasingly often integrated (McCreary et al., 2019). Especially in the context of rural nature-based tourism, environmental values can produce a moral dilemma to many travellers. While often considering themselves as 'nature lovers', their behaviours, especially transport mode choices, often don't reflect this identity (Davies & Weston, 2015), describing an attitude-behaviour gap (Juvan & Dolnicar, 2014).

Travel motivations

Travel motivations refer to the type experiences and activities that intrinsically motivate their travels (push motivators) or externally attracts them to a specific destination (pull motivators) (Le-Klähn & Hall, 2015). The various travel motives reflect the heterogeneity of personal tastes and preferences

and affect many decisions taken within the wider tourism chain. This includes intra-destination visits (Masiero & Zoltan, 2013), accommodation choices, activity choices and related equipment intensity (LaMondia et al., 2010; Le-Klähn et al., 2015) as well as transport mode choices (Le-Klähn & Hall, 2015; Masiero & Zoltan, 2013). Certain travel motives or activities involve travelling to remote places with few people and low public accessibility, which conflicts with PT usage (Davies & Weston, 2015; Kelly et al., 2007). While often considered an obstacle to independent leisure and tourism activities, PT can also increase flexibility and enhance the experience, for example on non-circular biking or hiking trips (Davies & Weston, 2015; Guiver et al., 2007; Lumsdon et al., 2006). In these contexts, transport is not only a means to reach a destination, but a travel motivation in itself. This is also emphasized by studies on drive tourism in rural destinations in the U.S. (Meng & Hudson, 2012) or cycle tourism in China (Han et al., 2017).

Situational characteristics

According to previous work, travel party, group size and destination familiarity are influential determinants of mode choice for leisure (Kelly et al., 2007; Le-Klähn et al., 2015). Further determinants of mode choice are the overall trip complexity (a combination of destinations or chain of activities), which has shown to increase car usage (Gross & Grimm, 2018; Ho & Mulley, 2013; Le-Klähn & Hall, 2015). The cause or effect of this relationship is difficult to assess since the access to a car also allows for different types of trip patterns, as highlighted by Gross and Grimm (2018). Another relevant aspect is the length of stay, affecting general destination choices of German travellers (Marcussen, 2011) and (with increasing length) positively affecting the likelihood of PT usage of German and Spanish travellers (Gutiérrez & Miravet, 2016; Le-Klähn et al., 2014). In the case of Spanish coast destinations, accommodation was influential with PT being chosen more often by travellers staying in 4-/5-star hotels or private places of friends and family (Gutiérrez & Miravet, 2016).

Attributes of car and PT trips

Destination accessibility by the preferred mode of transport can both inhibit tourism but when established, can also enhance destination attractiveness (Della Corte et al., 2010; Marrocu & Paci, 2012) and affect mode choices (Davies & Weston, 2015; Le-Klähn & Hall, 2015). Another frequently mentioned factor is travel distance, time and related costs. Thrane's (2015) study in Norway showed no significant difference in mode choice probability of car and PT resulting from travel distance. This matches with other studies from Vietnam and Canada that show a decreasing choice probability of any transport mode when distance and travel time increases (Can, 2013; Kelly et al., 2007). The negative influence of distance on any mode choice probability might be caused by (fairly) linearly increasing travel costs instead of actual travel time. The latter increases less linearly (Kelly et al., 2007; Seddighi & Theocharous, 2002) with high-speed infrastructure (highways, high-speed trains) becoming available on longer distances, favouring PT usage for long-distance trips (Gutiérrez & Miravet, 2016; Ravazzoli et al., 2017).

Another important aspect is the quality of transport infrastructure, referring to the reliability, comfort and convenience of different modes. For PT, the specific modes (i.e. bus vs. train), as well as the type of train (regional vs. high-speed), the number of required transfers as well as the frequency of transport connections are influential factors (Kelly et al., 2007; Le-Klähn et al., 2014). In that context, regular high-speed train connections are an effective tool to foster tourism developments and increase PT attractiveness for tourists, both in Spain (Albalate & Fageda, 2016) and for alpine areas in Europe (Ravazzoli et al., 2017).

Despite this focus on increasing travel speed, studies from across Europe reveal that travel time does not inevitably represent a cost or negative utility in the tourism context. Time on the road or the train can also be perceived as pleasurable. The ability to actively use PT trips for the enjoyment of scenery, social contacts or other activities positively influences the willingness to use it (Davies &

Weston, 2015; Guiver et al., 2007; Le-Klähn et al., 2014). In this context, on-board comfort relating to cleanliness, safety, space and on-board amenities (WIFI, food and drinks) can also enhance the PT experience (Le-Klähn et al., 2014) and therefore promote its usage.

Destination features

According to previous studies, destination choices are mainly influenced by geographical features and available tourist infrastructure or attractions (Marrocu & Paci, 2012), whereas mode choice is affected by available transport infrastructure (Le-Klähn et al., 2015). This assumes that there is no cross-sectional relationship, hence tourism infrastructure is not presumed to affect mode choices, a viewpoint shared by LaMondia et al. (2010).

With regards to relevant tourism infrastructure, previous studies have investigated the positive effect of accommodation, gastronomy, museums and natural features (such as beaches and parks) on destination choices (LaMondia et al., 2010; Marrocu & Paci, 2012). For the context of Italian rural nature-based destinations, Marrocu and Paci's (2012) highlight the negative influence of crowdedness on destination attractiveness, which is in line with other research emphasizing people's desire for remoteness (Boller et al., 2010; Woods, 2011). Despite positively affecting destination choice, remoteness is hardly compatible with comprehensive PT supply, since a conventional PT network bases its effectiveness on density and consolidation (Kelly et al., 2007; Marrocu & Paci, 2012). Unfortunately, this aspect could not be included in the empirical part of this study since the available data contain no information on accommodation locations and intra-destination movements.

Previous research also highlighted the positive effect of people's level of information on choosing PT (Dallen, 2007; Le-Klähn & Hall, 2015). While this can be classified as a personal characteristic, it is strongly dependent on the information provided from the part of the destination (Le-Klähn & Hall, 2015). This aspect also translates into the overall ease of using PT systems for tourists who are not familiar with the local network. Another factor feeding into the ease of local PT use is the complexity of the fare structure and the additional services they include (Imhof et al., 2009; Lumsdon et al., 2006). To facilitate people's use of PT in the destinations, many German cities (inspired by Austrian destinations) have introduced so-called 'destination guest cards' (Gronau, 2017). These cards often come for free with the booked accommodation and entitle to free (therewith easy) PT usage among other benefits (Gronau, 2017; Hall et al., 2017). By also reducing the necessary budget for the entire time spent in the destination, such offers do not only shape mode choices but can represent a unique selling proposition that can also influence destination choices (Gronau, 2017; Marcussen, 2011).

Methodology and model development

Modelling procedure

The model used for this analysis must facilitate the parameter estimation of a combined choice of tourist destinations and transport modes. As visualized in Table 1, mode choice models are often discrete choice models (MNL model or its derivatives, such as nested logit (NL) or mixed logit, see Bhat, 1998; Schmid et al., 2019; Ortúzar & Willumsen, 2011). Modelling destination choices is less straightforward. One group of models are spatial interaction models (LeSage & Pace, 2010). Dealing with (i) revealed preference (RP) data, which are (ii) specified in real space, and (iii) aggregated, these models can capture inter-neighbouring interactive effects. They are, however, limited to the availability of aggregated statistics regarding trip and destination data. The second group of models are discrete choice models (Landauer et al., 2014). They are usually dealing with (i) stated preference (SP) data (usually generated through choice experiments with hypothetical destination features), which are (ii) not specified in real space, and (iii) disaggregate.

Our data represent an interim status between both types: They include (i) RP data on mode and destination choices, which are (ii) specified in real space (geocoded), and (iii) disaggregate. The

revealed nature represents a large advantage, especially with recent studies nursing doubts about the alignment of stated and actual behaviour (for waiting time: Krčál et al., 2019; for leisure time: Verbooy et al., 2018). Ultimately, our choice of using an MNL model is justified by the disaggregate nature of our data, the large number of destinations as well as our research focus on the spatially specified attributes of destinations and the trips to go there. The resulting data complexity poses considerable challenges on the modelling:

(1) A large number of alternatives: our dataset includes 295 different destinations with two mode choice options, which yields 295 * 2 = 590 alternatives (582 after removal of destinations not accessible by PT). We refrained from grouping destinations as a measure to reduce the large computational effort, because we consider the level of detail a particular strength of our data.
(2) A large number of possible model predictors (341 candidates) (see Table 2), making it impossible to test each variable separately (stepwise approach) or simultaneously.

Following from the latter point, we employed an ex-ante screening of predictors among the candidate variables using the semi-partial correlations with the choice variables (car, PT, destination) as an indicator of the expected predictive power. We performed an ex-post pairwise comparison of the t-values of model parameters and semi-partial correlations and found a fairly good match concerning the correlation (0.934) and the size of alpha.

Furthermore, we considered that the combined choice of mode and destination may generate a nested structure of alternatives. However, a test of the final model with a nested specification revealed that both nest parameters did not significantly differ from one. A reason for this could be the high explanatory power of the model predictors, resulting from the large set of candidates. It reduces the risk of missing out on 'hidden relationships' between the alternatives, that are not captured by the predictors and cause correlated error terms, that way violating the IIA assumption. The rejection of the NL results in a conventional MNL model, which takes the following form:

$$P_{(m=i \,\cup\, d=j)} = \frac{e^{V_{ij}}}{\sum^e V_{ij}} \text{ with } V_{ij} = \beta_m + \sum_o^\beta x_o + \sum_t^\beta x_t + \sum_v^\beta x_v$$

where P denotes the probability of a combined choice of mode i to reach destination j; $m = \{car, PT\}$ and $d = \{1, \ldots, 295\}$ the vectors of available modes and destinations; V_{ij} the deterministic component of the utility of using mode i to visit destination j; β_m the mode-specific constant; $\beta_o x_o$, $\beta_t x_t$ and $\beta_v x_v$ the parameters (β) and variable values (x) of origin-specific, trip-specific, and destination-specific attributes, respectively; subscripts of individuals are omitted. The origin-specific variables (x_o) do not vary across modes and destinations. The origin-specific variables could affect the destination choice only through interaction terms with destination-specific variables ($x_o \, x_d$), some of which were tested but not present in the final model. The model was estimated using R version 3.5.3.

Data sources and variables

The analysis is based on quantitative data from an online survey with 877 participants conducted in summer 2017 in Vienna (more details see Juschten et al., 2019). The survey population is representative for the Viennese population according to age (from 14 to 69) and gender by using respective quotas. Despite not being representative for all Viennese travellers, a high share of 80% of the sample have reported a visit to any Austrian summer destination in the past two years including further trip details (representing our data sample).

As part of the data preparation process, we geolocated all reported destinations at town/village level (adding 'train station' or 'town centre' to the query) using the 'geocode' function in R. After excluding non-locatable or bike/walking trips, the final sample includes 692 trips to 295 destinations, (for destinations, see Figure 1).
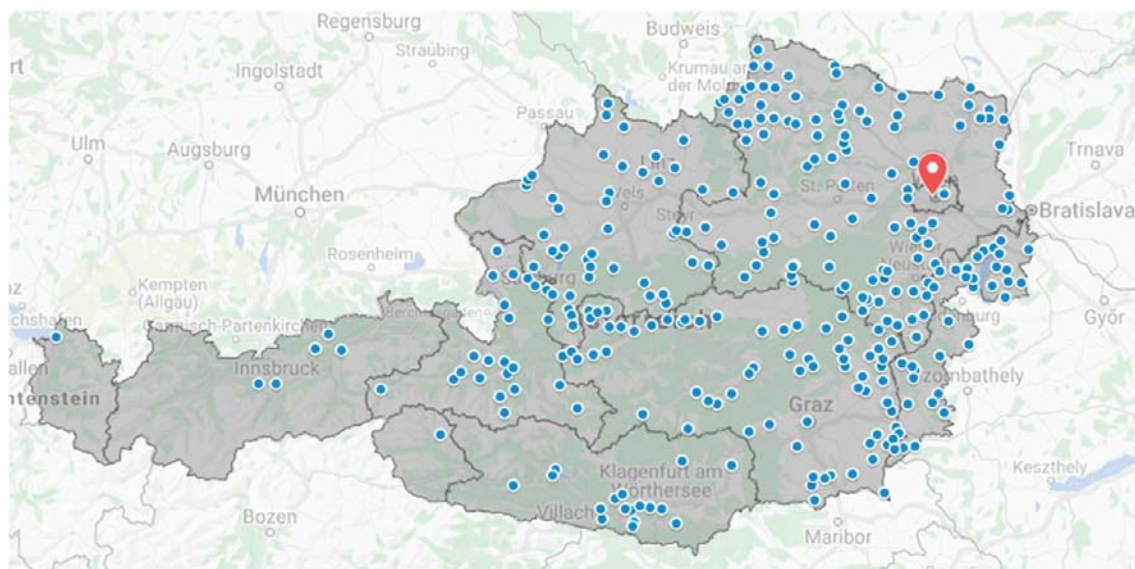
Figure 1. Map illustrating the locations of all 295 visited destinations, Authors' illustration using Google My Maps.

To go beyond the status quo of most existing studies in the tourism field, our analysis integrates both demand-side characteristics (based on the Viennese survey) and extensive supply-side characteristics (based on OpenStreetMap and VAO queries as well as manual internet searches, see Table 2). The tourism infrastructure characteristics was retrieved using OSM queries for the respective amenities (accommodation, etc.). To count available tourism infrastructure in a 60-minute walking or 20-min biking distance, a road network-based Service Area Analysis was performed in ArcGIS. Using the spatial join function, the sum of facilities within the service areas was calculated using the time thresholds as weights (to illustrate the attractiveness of close facilities). The trip characteristics were generated by performing rooting requests using VAO for all 6195 combinations of 21 origins and 295 destinations in R. All retrieved destination and trip features were linked to the survey dataset by means of unique trip and destination identifiers. Table 2 illustrates the number of screened candidate variables by category and the number of variables that entered the model.

The results from the semi-partial correlations show that both household and personal characteristic did not have strong predictive power on people's mode and destination choices, with two exceptions. Exceptions include mobility tools and attitudes towards and experiences with car-free travel options. The latter would explain the mode choice for a specific holiday trip with a generalized statement on mode preferences. Due to the problems related to such circular reasoning, we have excluded these pseudo-independent variables. This insignificance of household variables (especially income) contradicts previous studies (Marrocu & Paci, 2012) and may be related to the collective nature of tourism decisions (Bronner & de Hoog, 2008) or the specific tourism context of this paper. Compared to budget-intense long-distance trips, people might be less price-sensitive when visiting nearby, often familiar, destinations, confirming previous findings on determinants of price sensitivity (Masiero & Nicolau, 2012).

Modelling results and discussion

Descriptive results

The total number of trips in the sample is 692; 24% of which were done by PT. 64% of respondents travel with their partner (and possibly other people, i.e. children). The average trip distance of reported trips is 181 km, reached with an average speed of 85 km/h (car) or 56 km/h (PT). For 89% of trips, a train connection was available. This surprisingly high value (given the rurality of many destinations) might be the result of two factors: first, Austria has a high railway network density (for a comparison of three network

density indicators between all EU countries, see Global Mass Transit Report, 2017), extending into rural areas. Second, train stations (if available) or central village locations were used as input for the geocoding requests due to the unavailability of address-specific destination data.

Regarding in-destination mobility offers, the data show that rental bikes were available in most places (79%), whereas cable cars and boat rentals are less common (27% and 24%, respectively). In 21% of visited destinations, hailed shared taxi services were available and 19% of offered some sort of guest card that included free public transport (see Gronau, 2017). This matches roughly with the number of destinations who try to position themselves through a strong web presence, including mobility information (22%).

The relationship between travel distance and travel time for car and PT trips

An important aspect of the trip characteristics is the strong positive correlation between travel distance and travel duration. The resulting collinearity masks the true influence of both variables on the mode-destination choice. Preliminary tests showed that the effect of duration is not significant if both variables are present in the model. To disentangle the effects of distance and duration, we calculated the *specific* travel duration as duration/distance (min per km travel, the inverse of speed). The specific duration is more independent from the distance and correlates negatively with the latter, since long trips have higher shares on high-level infrastructure. More importantly, it reveals a systematic difference between the car and PT as shown in Figure 2. While the car is in most cases faster, the speed difference to PT diminishes as the distance increases and disappears at a distance of approximately 400 km. Please note that the car travel time is obtained from a routing information system, which returns the net travel time without breaks, whereas the public travel time is the actual scheduled time of real-life connections. This finding is in line with previous research from Spain and various alpine countries, which concludes that travel time of PT becomes more competitive over longer distances (Gutiérrez & Miravet, 2016; Ravazzoli et al., 2017), often facilitated by an effective high-speed rail network in place. The distance was left unchanged; it captures the sensitivity to the distance as such (if there is any) plus the sensitivity to that part of travel duration, which would result from a travel at average speed.

Results of MNL model and discussion of model fit

Table 3 shows the result of the MNL model. The rho-squared (McFadden, 1974) is very low, but it is no suitable diagnostic criterion in this case because it decreases with an increasing number of alternatives. We were, however, not interested in the particular destinations themselves but in the predictive power
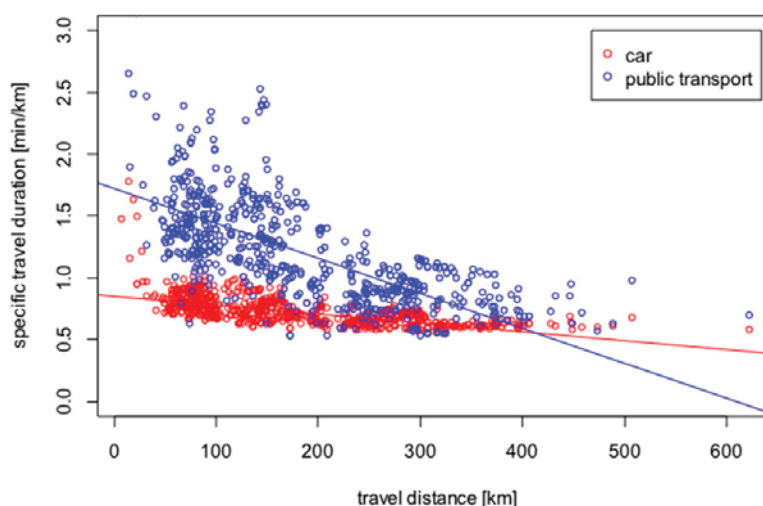

Figure 2. Relationship between distance and specific duration for car trips and PT trips in the sample.

of the destination features. More suitable diagnostics are therefore the t-values of the individual parameters and the sum of absolute *t*-values, roughly indicating the total explanatory power of the model.

The model includes a total of 19 parameters, which deviate significantly from zero with the exception of the 'availability of mobility offers in the tourism card'. In order to test the model's affectedness by confounding effects, we compared the t-values of all parameters with those of the bivariate correlations between the predictors and the choice variable, amounting to a correlation coefficient of 0.905. It indicates that the model is fairly robust despite the numerous predictors, because they are sufficiently independent from each other.

The parameter estimates provide new insights into the factors influencing destination and mode choice in the context of urban–rural tourism trips in Austria. The relatedness between both types of choices is evident from the mode-specific parameters, which involve trip attributes as well as destination features. Please note that these parameters indicate the size but not the direction of the interaction between mode and destination choice. To facilitate the interpretation of the predictors, Figure 3 illustrates the t-values of the parameters. They indicate the direction and strength of the variables' statistical influence on transport mode choice (blue: PT; orange: car use) or destination choice (light green).

Discussion of relevant model predictors of mode and destination choice

Person and household characteristics

Figure 3 shows that the available mobility tools (car and PT discount card) are the only person/household predictors in the model, with car ownership negatively and PT discount cards positively

Table 3. Parameter estimates of the mode-destination choice model.

	Parameters related to choice of …			
Variables	public	car	destination	Robust *t*-values
Constant (fixed at 0 for normalization)		0.000		n.d.
Constant	−1.618			−2.393
Person and household characteristics				
# Cars in the household (hh)	−1.107			−4.651
# Public transport discounts in the hh	0.829			5.610
Situational characteristics of overall urban–rural leisure trip				
Joint travel with partner	−1.062			−4.671
Private accommodation at destination	1.119			3.894
Attributes of car and PT trips				
Travel distance		−0.004		−5.705
Car travel duration per km		−1.272		−2.567
Travel distance	−0.002			−2.855
Public transport travel duration per km	−0.012 *			−0.052
No train connection avl. (only bus)	−1.450			−3.103
Destination features				
Quality of web presence			0.738	6.314
# Shops within walking distance	0.042			5.624
# Shops within walking distance		0.005 *		1.039
Tourism office or information point avl.			0.393	3.481
Rental bike available			0.373	3.472
Cable car available			0.398	3.041
Rental boat available			0.294	2.952
Mobility offers in tourism card avl.			0.154 *	1.275
Shared taxi available			−0.210	−2.084
Diagnostics:				
# of observations 692			Null log-likelihood −4405.729	
# of alternatives 590			Constant log-likelihood −4311.012	
# of parameters 19			Final log-likelihood −4063.873	
			McFadden's rho-squared 0.078	

Please note that (i) the standard errors and *t*-values were calculated using the Delta method (Daly, Hess & de Jong, 2012); (ii) * indicates parameters, which do not significantly differ from zero ($a > 0.05$).
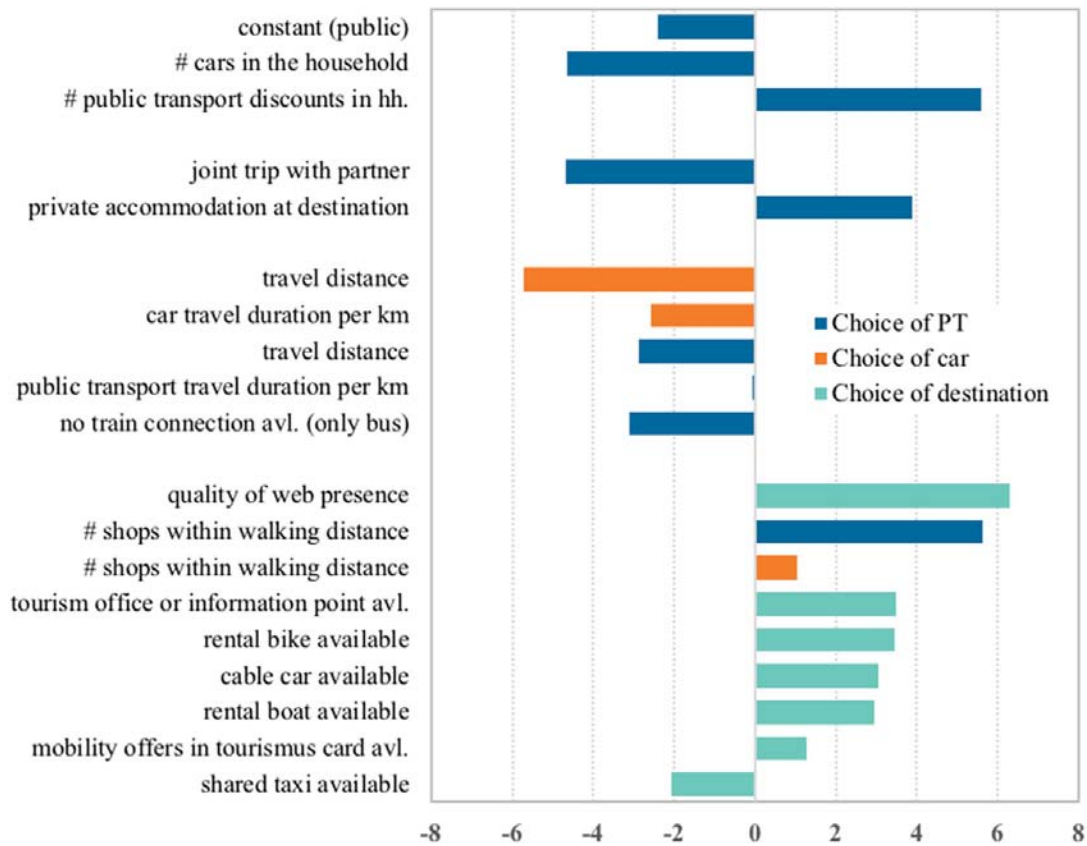
Figure 3. Illustration of the explanatory power and direction of the effect of different model predictors.

influencing PT usage. It illustrates that tourism mobility choices are related to people's habitual mobility, despite the differences in trip characteristics and motivational aspects. The car ownership effect is in line with previous research highlighting its relevance for various mode choices (Gross & Grimm, 2018).

Situational characteristics

The travel situation affects people's mode choices through two variables: travel company and type of accommodation. Travelling with a partner decreases the likelihood of using PT. Part of the reason might be that travelling with several people increases the cost of PT proportionally, whereas the car costs remain the same. Furthermore, privacy and the enjoyment of the trip together also favour car use for groups of two and more people, as highlighted by previous studies (van Middelkoop et al., 2003). The opposite result of Le-Klähn et al. study (2015) is likely to be caused by sample differences. Theirs also contains business travellers, who are well-known for being more car-affine. The second predictor is the accommodation type: travellers staying in private accommodation (friends or family) are more likely to use PT for their trips. While this has been previously highlighted (Gutiérrez & Miravet, 2016), this aspect came somewhat unexpected. We were aware that considerable share of the visitors of Austrian summer destinations grew up and/or have family ties at the visited places (Juschten et al., 2019), yet we did not expect them to be more PT-affine. One possible reason is that they can more easily organize their mobility at the destination without bringing their car along by relying on family and friends.

Attributes of car and PT trips

The effect of travel distance and travel time has been noted in many studies (Can, 2013; Kelly et al., 2007; Marrocu & Paci, 2012). Our study confirms their importance. The two main findings are: (i) the longer the distance, the lower the probability of usage of both modes, which means a lower probability of visiting the destination at all; (ii) the longer the distance the higher the probability of

using PT instead of a car when visiting. The latter effect operates on several systematic differences between car and PT, which involve infrastructural characteristics as well as travellers' tastes:

1. PT travellers are less sensitive to travel distance (and travel times) than car travellers. This can be explained by the relatively steep increase of PT travel speed with increasing distance (see Figure 2), such that the average travel duration increases under-proportionately to the distance.
2. PT travellers (within the Austrian context) are almost insensitive to the travel speed, but they are sensitive to the type of vehicle: being forced to use a bus instead of a rail connection is perceived as a downgrade in terms of travel quality.
3. Car travellers, in contrast, are quite sensitive to travel speed. This is not surprising, because low car travel speed usually implies driving on small rural roads, which can be strenuous on long distances.

The lower time-sensitivity of PT travellers compared to car travellers is confirmed by recent studies, which revealed a much lower value of travel time saving for PT than for the car (7.90 vs. 12.40 €/h, see Hössinger et al., 2019; as well as Schmid et al., 2019). The low willingness to reduce PT travel time was argued to result from the release from the driving task, which enables PT users to engage in many kinds of secondary activities that make the time spent on travels more comfortable, entertaining, and useful (Davies & Weston, 2015; Guiver et al., 2007; Le-Klähn et al., 2014).

Destination features

The large number of influential variables on destination features illustrate that much can be done in and by the destinations to attract visitors and shape their mode choices. The most influential variable favouring the destination choice is the destination's quality of web appearance, including their online advertisement of non-car travel options. The variable reveals the broad positive effect of attractive, comprehensive and up-to-date information provision and online marketing (possibly also on other aspects such as tourist attractions and events). This reflects findings from previous studies highlighting the challenge to actively address tourists in relevant target markets instead of passively waiting for their arrival (Pesonen & Tuohino, 2017). The availability of destination guest cards also tends to have a positive (although not significant) effect, which shows their attractiveness (see also Gronau, 2017). Beyond the individual benefit arising from such cards, such offers demonstrate a more systemic destination quality: they portray the destination as a well-connected, engaged and forward-thinking community, a worthwhile public perception.

For tourists arriving by PT, the results indicate their need for sufficient sources of local supply in walking or biking distance. The number of shops is in fact a proxy for other local suppliers such as accommodation options and gastronomy, which are not included because of confounding effects. It suggests that PT travellers like to maintain their independence in that they wish to find relevant services nearby without relying on transport services (Ho & Mulley, 2013; Le-Klähn & Hall, 2015). This is no confounding effect with the town size or settlement density, because the number of inhabitants was also included in the candidate list but had a lower effect.

Within destinations, cable cars, rental bikes, and rental boats are attractive forms of local mobility that are often available and enhance a destination's likelihood to be visited. These mobility tools illustrate what kind of destinations features or tourism activities people are seeking for when travelling to summer destinations: proximity to mountains, water and bikeable sceneries allowing them to explore their surroundings in an active manner. This confirms the findings from previous studies on tourist segments and their demand profile in this research context (Juschten et al., 2019). Shared taxis, on the other hand, decrease the attractiveness of destinations, which might come as a surprise. However, from a tourists' perspective, this form of mobility represents an emergency solution that resonates the lack of an attractive PT system. Demand-based systems are often perceived as risky (due to the lack of schedules and pre-defined stops), requiring the tourists to familiarize themselves with the functionality and specifics of each particular system. Former studies have shown that tourists

also struggle to familiarize themselves with schedule-based bus systems in rural areas (Guiver et al., 2007), but this is not necessarily an argument for demand-based systems.

Conclusion and implications

This paper investigates the combined destination and mode choices of urban–rural tourism linkages between Vienna and predominantly rural Austrian destinations. Using a MNL model, this study yields new insights into the interrelations between these choices. In doing so, it depicts the effects of mobility tools, trip and transport quality features, as well as on-site mobility options and tourism infrastructure on the revealed mode and destinations choices. Other than previous studies that focused more on the demand side (Marrocu & Paci, 2012), this study covers a large number of supply-side factors, which were obtained from an innovative data gathering procedure.

This study has several findings with significant theoretical and planning implications. First, this study reveals that trip characteristics are more influential on these tourism choices than sociodemographic characteristics (see also Kelly et al., 2007; Le-Klähn et al., 2015). Second, while previous researchers treated tourism destination and transport mode choices separately (LaMondia et al., 2010; Le-Klähn et al., 2015), we show that (i) both are intertwined rather than isolated choices, and (ii) destination and transport features both affect the combined choice.

Third, car and PT travellers perceive the time and distance of travel differently. Both groups are reluctant to drive long distances, but car drivers much more so, especially when driving at low speed. PT travellers are more willing to accept long distances, first because they can use the time for pleasurable things and second because longer distances benefit from high-speed trains. For the destinations, this means that PT has the potential of attracting visitors from further away if they can offer a train connection (Ravazzoli et al., 2017). PT operators, on the other hand, are required to provide comfortable and affordable train connections to the destinations. The substitution of rural branch line trains by bus systems is clearly no help in this regard, because a bus is regarded as a downgrade from a train from the travellers' perspective.

Fourth, with respect to the destination features, the most powerful determinants were (i) the destination's branding and information provision with a focus on attractive and innovative online marketing and (ii) the connectivity of destinations in terms of local supply infrastructure. Especially for PT users, walkability within a tight-knit, well-connected community enhances attractiveness, because it reduces travellers' mobility needs and minimizes the planning efforts for trips, especially when accompanied by comprehensive information online. Such a setting facilitates people's tendency for risk avoidance (which we assume to be high in the context of get-away from everyday stress) and replaces their fear of 'getting stuck' without a car by a sense of independence and enjoyment of active mobility. For destinations, this implies a need for a thorough assessment of their communication platforms in terms of attractiveness and ease of use, and the need for closer cooperation between various stakeholders to develop a diverse yet well-connected and easily accessible tourism portfolio.

Fifth, tourist mobility is connected to everyday mobility through path-dependency-creating choices such as the purchase of a car or a PT season ticket. It suggests that both are embedded in (and controlled by) an overall setting, which we attribute to underlying mobility cultures (see Haustein et al., 2020). This finding has several implications. Policy-makers need to work on developing a mobility culture with positive attitudes towards PT and a lower car-orientation. A focus may be placed on enhancing the intrinsic enjoyment of travelling (as with drive or bike tourism) through target-group specific mobility offers (Guiver et al., 2007). Ideally, destinations should offer landscape-specific vehicle rentals (i.e. mountain bikes), related PT offers (i.e. buses with bike racks) and related trails within a wider motivational package highlighting the involved affective values.

Figure 4 summarizes the essence of our understanding and is based on the following arguments: first, individuals are embedded within a wider mobility culture that affects all further travel decisions. Second, the travel situation sets the scene for the options at hand in terms of travel and mode

choices. Third, mode and destination choices are both influenced by destination and transport features, showing their interconnectedness. We are aware that this visualization cannot match the full complexity of reality but we consider it a helpful visualization of our results with regard to relevant factors influencing mode and destination choices in the context of urban–rural tourism in Austria.

While this paper advances the understanding of transport mode and destination choices in tourism contexts, it comes with some limitations and needs for further research. First, the visited destinations were specified as place names rather than addresses. More detailed location information, as well as tourism movements and activities within the destination, would improve the understanding of tourism choices. Second, this study's findings and discussion thereof is more strongly embedded in and contrasted to previous work on (touristic) mode rather than destination choices, requiring further theoretical and empirical research on their interconnectedness. Third, further research is needed to understand in which ways urban mobility cultures (as in the sum of material and symbolic factors influencing the dynamics around infrastructures, institutions and social practices of mobility, see Haustein et al., 2020) affects the way people travel for leisure, especially towards rural areas. Our study merely included the number of cars and PT discount tickets as a proxy for materialized (or institutionalized) automobility respectively PT-affinity in Vienna, lacking a deeper understanding regarding people's perceptions of and experiences with the built environment. Fourth, we identified the destinations' web presence as the strongest single predictor for destination attractiveness, but this feature was measured in a broad way. It remains to be investigated which precise information travellers desire and which communication channels and presentation forms are most suitable to present the destination as a place worth visiting, especially by PT. Lastly, this study is limited by the methodological shortcomings of model-based analysis, which can never fully comprehend and quantify all personal, situational and wider societal determinants that affect people's travel choices.

Despite these limitations, the paper contributes to the advancement of tourism research in various ways. The study combines theoretical knowledge on choice determinants from two usually separate fields of social science research, tourism and transport research. The study uses a rare combination of spatially specified revealed preference data at the disaggregate level. While rare in existing choice models, this approach improves both the study's reliability and level of analytical detail. The novel results are only made possible by the innovative data sourcing procedures, which account for the changing realities in social science research. By offering new perspectives on mechanisms underlying tourism choices, this paper can serve as an additional element of the knowledge basis required for the wider discussion on transitions of socio-technical regimes (including automobile-dependent tourism systems) towards more sustainability. While this study focussed its analytical efforts on the
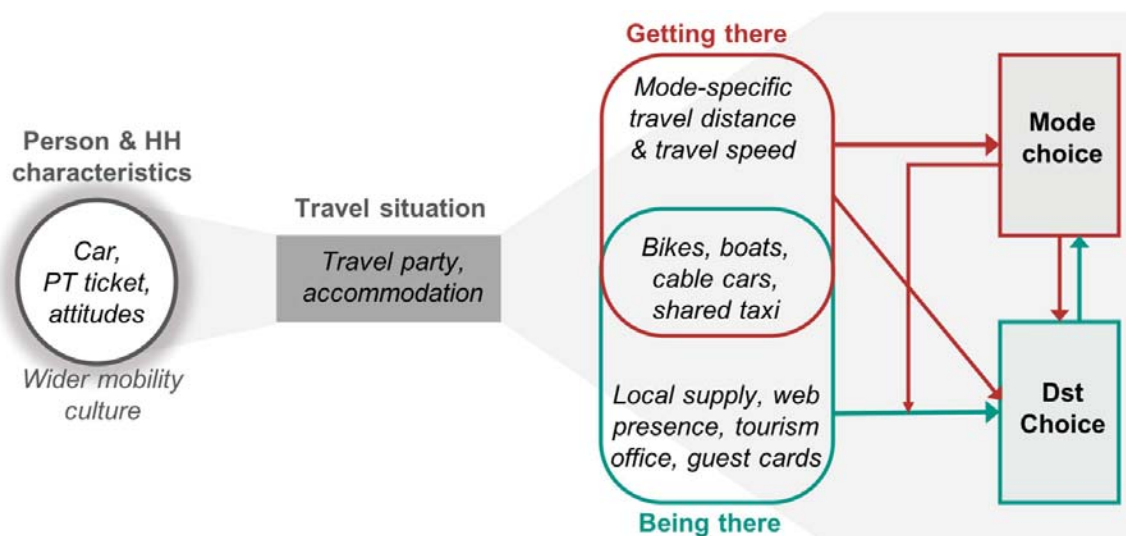

Figure 4. Conceptual framework on factors influencing urban–rural tourism choices, boxes referring to influences of destinations choice (green) and transport mode choice (red).

individual, any transition efforts should understand the tourist as one element within a wider system, requiring both individuals as well as institutions to change (see Hall, 2016). A possible starting point for this are social marketing concepts that incorporate this need for a multi-level and interdisciplinary perspective within their set-up.

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Paper

Author's contribution:

The thesis author is the main contributing author. Her roles included the conception and conduction of the overall study, the data analysis as well as the conception and write-up of all paper parts as well as the majority of editing within the revision stage.

Both co-authors provided feedback on the overall methodology, the structure and contents of the paper. They also supported the revision and editing process, and provided language support.

Article

Mindsets Set in Concrete? Exploring the Perspectives of Domestic Travellers on New Zealand's (Auto-)Mobility Culture

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Abstract: Tourism trips in New Zealand are strongly car-dominated. Research suggests that such car use practices do not only emerge from purely rational economic considerations but also result from symbolic and affective motives, institutionalized mobility cultures, and habitualized mobility practices that have developed and materialized in spatial structures over decades. This paper explores the notion of automobility and its influence on the domestic tourism mobilities of Christchurch residents. It does so by applying Q methodology, an inherently mixed method that involves participants structuring statements by their level of agreement, followed by a range of qualitative post-sorting questions. The statements draw on insights from the study of tourism mobilities, mobility cultures and classical mode choice research, allowing this study to provide novel insights into the under-researched field of urban–rural tourism mobility. The juxtaposition of quantitative Q and the qualitative interview results reveals influential factors at the personal, interpersonal, societal/political and infrastructural level. The results then feed into a conceptualisation of influential factors of tourism mobility choices using an embedded, interlinked structure that captures the dynamics of social interactions (i.e., feedback-loops). Policy implications are discussed with regards to possible sustainability pathways in line with New Zealand's decarbonisation strategy.

Keywords: mobility culture; rural leisure trips; New Zealand; sustainable tourism mobility; exploratory analysis; Q methodology

1. Introduction

New Zealand is a country that is well-known for its vast natural landscapes, breath-taking sceneries and a unique diversity in flora and fauna, and its tourism marketing has focused on these landscapes and natural features since the very beginning of tourism in the late 19th century [1]. While most research focuses on international visitors, the large share of domestic guest nights (57.4% of the 40.4 million guest nights counted in the year ending in June 2019) were experienced by domestic travellers (see [1]). This justifies further research on domestic tourism, with its large economic and social significance for New Zealand. Especially during times of exogenous shocks (such as the economic crisis or the recent global pandemic), New Zealand's economy largely depends on domestic tourists, increasing the importance of research on its motivators, facilitators and structures [2].

Inspired by the diversity and spatial proximity of natural and cultural sights, New Zealand's tourism is largely mobility-based (rather than resort-based tourism, such as in the Maldives, for example).

In consequence, domestic tourism or leisure trips (defined as trips above 40 km outside the travellers' place of residence, see [1]) towards rural destinations are strongly dominated by car travel. Between 81% and 94% of domestic leisure trips are taken by car [3], according to our own analysis using New Zealand's Household Travel Survey data from 2003–2014.

New Zealand's second largest city and the tourist source market investigated in this study, Christchurch, has undergone various efforts in the past years to promote cycling and public transport (PT) usage. Many of these initiatives have been part of the rebuilding processes after the 2010/11 earthquakes hit this city of 340,000 inhabitants characterized by a polycentric urban structure and low urban density. Nevertheless, Christchurch is still largely car-dominated in terms of people's minds, the materialized urban structures [4] and the trips being made; e.g., 84% of Christchurch's commuting trips are made by car, see [5]. Automobile dependency is even stronger in the rural areas that many of New Zealand's tourist attractions are located in. As such, self-drive tourism either by car or van is the most prominent way of travelling in New Zealand [6], and is a substantial contributor to regional economies along classical tourist routes in many parts of New Zealand.

Research suggests that people's practices of car usage—both in the context of daily trips and tourism—do not only emerge from purely rational economic considerations but are also a product of aesthetic, sensory and affective motives, as well as institutionalized mobility cultures that have developed over decades [7–9]. As a global phenomenon, car ownership and usage is associated with core features expected from development and modernity, namely freedom, individualisation, convenience and comfort [10]. As such, the role of the automotive industry exceeds beyond jobs and GDP contributions; it has turned into a "technological regime dominating the economies of several industrialized countries" [11] and, in consequence, shapes public and political discourses. Despite there being no uniform global experience of car travel, the various forms of car-focused tourism mobilities prevail in most Western—as well as many developing—countries. They can be conceptualized as automobilities, reflecting "a simultaneous achievement of autonomy and mobility" [12]. This concept strongly revolves around the notions of freedom, sense of control and independence when travelling, all of which have become essential experiential tourism expectations [9]. Wilson and Hannam [12] challenge the often uncritical and rather "dreamy" notion of automobility that disregards the various social, environmental and economic problems associated with extensive car travel. As pointed out by Hannam et al. [9], the study of tourism (auto)mobilities, as framed within the mobilities paradigm, understands travelling as an activity that is strongly bound to people's every-day life and social realities, rather than an isolated event outside the normal, therefore tying the problems arising from tourism automobility into a matter of every-day life choices.

1.1. Factors Influencing Transport Mode Choices in a Tourism Context

Increasingly for every-day life choices in cities, but to a lesser extent also for tourism mobility in urban and rural settings, awareness is rising that ever-increasing private and fossil fuel-based car usage creates a wide range of problems, ranging from environmental and health concerns to debates over the just and efficient usage of limited public spaces. Not only to promote the use of existing transport alternatives to the private fossil-based car but also to develop new options in line with travellers' experiential expectations, understanding transport mode choices and underlying narratives matters. In tourism mobility, this need for understanding covers both destination and transport aspects, due to their interconnectedness, with transport having the role of either a facilitator, a constraint or even an inherent goal for any tourism activity [13]. In this sense, the relevance of the results also extends beyond classical policy-making, since tourism mobility also touches upon destination management, cooperation between private and public stakeholders, and transport policy-makers at different spatial levels.

Within the analysis of influential choice factors, much of the existing research in transport is shaped by positivist thinking and practice. Dominated by econometric modelling techniques based on stated or revealed preference-based data, the majority of such empirical research mainly covers quantifiable

and therefore more rational choice influences, which are possibly even answered by respondents with a bias towards socially-desirable responses [14]. Given the methodological individualism involved in these modelling approaches, most of these studies assume travellers to have full agency to perform whatever choice is most rational (or, at least, beneficial) to them. However, research shows that these underlying assumptions of rationality and full agency don't match reality [15,16]. In many cases, personal agency is restricted by external factors. This is especially applicable to tourism decisions, which are often joint decisions with other co-travellers [17], strongly limiting the personal power of decision-making. While people might, for example, consider themselves environmentally conscious, these factors can lead to them still making environmentally harmful tourism choices [18]. Typically, these studies cover some or all of the objective and subjective dimensions (a modified version of the classification by [19] is shown in Table 1 below), and are integrated into empirical studies through a range of indicators of individual tourism mobility choices.

Table 1. Dimensions and influential factors for tourism travel choices partly based on [19].

Choice Dimension	Examples of Choice Influences	Literature
Objective Influence Factors		
(1) sociodemographic features including available mobility tools	age, gender, education, income, car ownership, PT ticket	[19–21]
(2) overall trip characteristics	length of stay, budget, travel party, spontaneity of trip booking	[19,20,22]
(3) transport mode attributes	travel time, costs, service quality	[22–25]
(4) destination features	tourism and transport infrastructure	[20,25,26]
Subjective Influence Factors		
(5) attitudes, norms, perceptions	attitudes towards cars and PT and relevant destinations, risk perceptions	[21,27,28]
(6) travel motivations and related experiential expectations	i.e. relaxing, sports, culture, expectation of privacy, adventure	[9,29,30]

Some qualitative studies using alternative methodologies also display a bias towards these utility-maximization narratives, and both their research set-up and resulting data is shaped that way [31]. Especially in empirical studies, only a little focus is given to the cultural meanings of automobility, and the related drivers and barriers to behaviour change [25,32].

1.2. The Perspectives of Tourism Mobilities Research on the Desired Experiences of Car Travel

In contrast, research on tourism mobilities has largely focussed on the less rationalized choice factors, and the underlying meanings and experiences tied to different transport modes, especially to the car as the "chief purveyor of autonomous movement" [9]. Hannam et al. [9] also emphasize that transport means can have a considerable influence on the overall tourist experience. As such, the existing research points out the personal benefits of automobility with regards to the freedom, sense of control, flexibility and individuality it provides to travellers by extending their spatiotemporal range. Furthermore, the co-existence of friends or family members in a private, controlled space can turn the car into an extension of one's home, where one is shielded from the expectations, views and disturbances of the outside world. The fact that this private space and the landscapes experienced through different senses can usually be tailored to personal needs in terms of temperatures, music, travel speed and outside views enhances these comforts. Additionally, the research emphasizes the sensations of unpredictability along the road compared to rigid train tracks, offering little moments of surprise in terms of routing and speeds (and if so, they might not be the kind of surprise people are actually seeking) [9]. By enabling access to more secluded sights, they might also transmit a sense of superiority, or at least avoid the feeling of being excluded from worthwhile sights [33].

In this context, Edensor [34] argues that public transport insulates people from truly experiencing the landscapes through which they travel by turning travellers into static observers, as opposed to the sense of adventure tied to the spatiotemporal and mental freedoms that car travellers may experience.

Butler and Hannam [2] contest this notion by pointing out that PT travel also involves experiential benefits; for example, by enhancing the visual glance of the passing landscapes with the peace of mind to enjoy it without the need to concentrate on the road. Along similar lines, Sheller and Urry [35] emphasize the restrictions of car travels regarding sensual outside experiences, the speeds at which cars usually travel and the blurriness of experiences caused by the driver's need to focus on the road. This last aspect may be especially applicable to New Zealand's South Island, with its many curvy and narrow roads. When adding the distress and frustration that some travellers experience in the face of difficult road or weather conditions or heavy congestion, these studies may offer alternative perspectives on the convenience and comfort often tied to car travels only. In doing so, they represent interesting starting points for discussing the design elements of a sustainable and appealing tourism mobility system in both New Zealand and beyond.

To date, little insights exist on the factors influencing the tourism mobilities of domestic travellers in New Zealand. Vaguely connected studies exist that emphasize the prevalence of automobility in every-day life, which is assumed to transcend into travel patterns for tourism purposes (as the previously listed modal split statistics illustrate). The work by Fitt [4], for example, identifies the stereotypes associated with bus users, as well as the habitus of non-bus use practices (even though adequate routes and schedules might be in place) and general anti-bus dispositions as a main barrier to the use of public transport within Christchurch, even though residents might consider PT use in different geographical contexts. Hopkins and Stephenson [36] argue, however, that despite the existing (infrastructural, political and psychological) path dependencies of New Zealand's car-reliantculture, the share of younger travellers using various transport modes is increasing, which challenges the notion of a car-only country. This view is contested by a study on active travel, which shows that, for rural settings in New Zealand, travel distance plays an exceedingly strong role, leading to the perceived infeasibility of car alternatives [37]. With regards to tourism mobilities, most research in New Zealand is centred on international travellers or particular groups of campervan or cycling tourists (Bell, 2018). While some of these aspects may also apply to domestic travellers, existing car ownership, driving habits, familiarity with the roads and both written und unwritten rules, as well as the beforehand mentioned habitus of not using public transport in every-day life in Christchurch, may further inhibit alternatives to car use for leisure trips.

Regarding their choice of destination, the self-perception of many New Zealanders as being "an outdoor-loving people, with a way of life that is shaped around action and interaction with the environment" [38] can be assumed to affect the mobility practices and needs of domestic travellers. Within the general travel motives (outdoor activities, culture, visiting friends and relatives etc.), Hall and Kearsley [39] observe an increasing importance of individual values, self-fulfilment and achievement, as well as a desire for simplicity that contrasts people's demands for convenience in daily life. While parts of New Zealand's car dominance for leisure trips can be attributed to its spatial patterns, existing transport infrastructure and automobile culture [40], leisure-specific motives can be assumed to also play their part in determining travel needs and shaping expected experiences. However, research on rural tourism in New Zealand is scarce, and different studies highlight the need for a better understanding of the motivations and travel patterns of travellers visiting rural places [39], especially for different types of domestic travellers [3,41].

1.3. Resulting Research Objectives

Given these research gaps, this study tries to explore the various influences on the domestic tourism travel behaviour of New Zealanders, and asks: "Which factors frame people's narratives of their tourism-related transport mode choices?" Previous research from quantitative transport science highlights the relevance of instrumental choice motives including costs, time and the reliability of the available services. In contrast, the study of tourism mobilities emphasizes the importance of the emotional and symbolic nature of car use motives, and the role that togetherness, privacy, freedom, a sense of control and experiential expectations may play [9,12]. Research on mobility cultures, defined as

"specific socio-cultural settings consisting of travel patterns, the built environment, and mobility-related discourses" [31], additionally highlights the role of public norms and discourses—as well as materialized infrastructures and spatial forms—in such decisions. In a rather exploratory manner, this paper aims to combine these various perspectives, and to identify different groups of travellers by their subjective viewpoints regarding travel needs and their experiential expectations related to the trip. Given the semi-exploratory nature of this question and the aim to identify different types of travel narratives, Q Methodology—as the study of subjectivity—seems most suitable [42].

Novel insights were generated by applying Q Methodology as an inherently mixed method to the under-researched study field of the domestic tourism mobilities of Christchurch residents. By building on existing research on tourism mobilities [9,12], mobility cultures [8,31,43], travel motives and transport mode choices [20,23,32], it attempts to strengthen the interrelations and intersections between these research domains. In doing so, the paper provides a more integrated perspective on tourism-related mobility narratives and practices. Influenced by the increasing urgency of action to mitigate climate change, this study will use the findings to discuss possible sustainability pathways in the field of tourism management and transport policies.

2. Materials and Methods

Our research question is neither purely quantitative nor qualitative. Furthermore, relevant previous research has been conducted using various methodologies including quantitative surveys, qualitative interviews, group discussions and theoretical considerations on tourism mobilities. To take as many of these previous insights as possible into consideration while at the same time exploring the perceptions of transport options and reflections upon personal choice influences in a structured manner, Q methodology seems suitable [44–46]. It develops an in-depth, yet standardized dataset into a qualitative question, and uses statistical tools and qualitative content analysis to explore the existing viewpoints on the question at hand. Q methodology tries to identify groups of people who share the way they structure a set of items on a given topic, assuming a limited number of distinct viewpoints on any given subject [47]. Unlike classical R methodology, which tries to find relations between people, Q tries to find relations between statements or topics in order to draft a comprehensive picture of the available discourses in society on a given topic [48]. To identify the full set of viewpoints, sufficient focus needs to be placed on diversity aspects within the statement development and participant selection [49].

Not many studies use Q methodology in the context of transport or tourism choices. Q studies in the field of transport mainly look at attitudes towards transport modes in an urban context [32,50,51] and their relevance for policy-making [52,53] or social inclusion [54,55]. Despite being few, some of these studies provide interesting insights for this study. The research by Cools et al. [32], for example, has aimed at depicting dominant discourses around medium-distance travel decisions. One of the groups is those of 'exclusive motorists', whose strong car preference makes them choose their destinations by car-related accessibility. Given the modal split and existing public debates, this might be the dominant type in New Zealand. In the tourism field, several studies exist using Q methodology as a research method. Their focus primarily lies on either the visitors' destination meanings or images [42,46,56], stakeholder perspectives [57], or the residents' perspectives on how tourism affects their community [45,56]. Since this study focuses mainly on transport mode choices concerning leisure trips, different meanings associated with the visited places are secondary for this study.

2.1. Q Sample—'Concourse' Development

The Q sample of this study is structured along the different behavioural, infrastructural, political and cultural dimensions of mode choice factors, and applies it to a leisure context to depict the factors influencing tourism-related transport choices. The nature of Q as the study of subjectivity does, however, contradict the holistic integration of both subjective and objective indicators. Therefore, we place the focus of our Q statements on the subjective indicators (categories 5 to 9). For these

categories, a separate literature search was performed seeking existing Q studies in order to integrate reliable and tested sets of statements. When these were unavailable, the statements were developed based on similar non-Q study research findings [39,58] or distant Q studies [46]. Within the bounds of possibility, some of the other indicators (categories 3 and 4) were re-phrased as perceptive statements; others were left out intentionally. Table 2 illustrates the data collected throughout the study.

Table 2. Data collection within the Q study.

No.	Category (CAT)	Elements Included in the Study	Study Part [a]	Statements	Relevant Literature
1	Sociodemographics	Gender, age, education, occupation, family size	S	/	Information from [8,58]
2	Urban form indicators	Residential location	S	/	Information from [8,58]
3	Transport and tourism infrastructure and supply	Satisfaction with and importance of infrastructure	Q	5	
4	Travel Behaviour	Car ownership, mode choice	S, Q	5	
5	Transport policy	Need for political action	Q	4	Adapted loosely from [8,32,52,55]
6	Public discourses	Problem awareness, i.e., environmental issues	Q	6	
7	Instrumental car use motives	i.e., time, costs, convenience	Q	7	Adapted from [32,51]
8	Symbolic-affective car use motives	i.e., status, freedom, fun, norms	Q	6	
9	Additional trip aspects	i.e., repetition of journeys	Q	5	
10	Preferred type of leisure activity during trip	Tramping/walking, fishing, camping, water sports etc.	S	/	
11	Chosen destination	Memory related to trip	S, I	/	Adapted from [56]
12	Motivation for leisure trip	Relaxation, nature, family time, local culture etc.	Q	9	Adapted loosely from [39,46]

[a] information retrieved from either S = short survey, Q = Q sorting process, I = pre-/post-sorting interview.

To test the comprehensiveness and intelligibility of both the statements and the introduction, questionnaire, and post-sorting questions, four pilot studies were conducted with researchers from tourism (2) and transport (1), and with former Q experience (1). The pre-test provided valuable feedback on useful changes with regards to the intelligibility of the statements and the ease of use of the material (laminated cards, scale labelling etc.). However, future studies may also consider performing pre-tests with lay people to include their needs and preferences in the design of the material.

2.2. P-Set—Study Participants

The literature suggests that, in Q methodology, the diversity of the participants is more important than the number of participants [55,59], and studies have provided relevant results with as few as 17 participants [60]. Some research suggests that the number of statements should be around double the number of participants [45,59]. To ensure this diversity of viewpoints, a structured participant sampling approach was applied using the following criteria: (a) Christchurch residents above the age of 18 with (b) an interest in one or more outdoor leisure activities (e.g., tramping, mountain biking, fishing, boating) and (c) vehicle ownerships (i.e., SUV, EV). Christchurch was chosen as a case study because it is the largest city in the South Island, and thereby represents one of the largest source markets for domestic tourism. The recruitment of the 25 participants took place through personal contacts and their suggestions (snowballing system), as well as social media groups related to different leisure activities.

All of the study participants live in the Greater Christchurch area, and therefore live in the context of a low density city with high levels of car ownership and use [5]. Public transport provision in Christchurch primarily consists of bus use (there is no urban rail provision, and one small public ferry service to an outlying settlement). Bus use amounted to 2% of daily travel in the city in 2018 [61]. The research's focus on outdoor leisure pursuits (such as tramping and boating) suggests that regional travel conditions may be more important to the study objectives than travel options within Christchurch itself. Christchurch is linked to national rail and bus services, but these are very limited in terms of the destinations that can be reached and the frequency of the services. From Christchurch, it is possible

to drive to any other road-accessible settlement in the South Island of New Zealand within a day, with Bluff (to the South), Nelson (to the North), and Greymouth (to the West) all accessible in (usually) less than 8 h.

2.3. Q Sorting—Interview Procedure

All of the interviews were conducted in New Zealand's peak domestic travel season, between December 2019 and January 2020. The interviews started with a short welcome, followed by the questionnaire completion and an introduction to Q methodology. After that, the participants were asked to describe a memorable domestic summer leisure trip to provide them with a tangible picture in mind, as described by [56]. They were then handed the 47 statement cards and were asked to sort them into piles of agreement, disagreement and neutral, followed by the fine sorting on the bell-shaped Q-sorting board (see Figure 1). Upon the completion of the sorting, a semi-structured post-sorting interview (in average 20 min) was performed. The questions covered: (1) the reasoning behind their placement decisions (with a focus on the extreme ends of the Q board) and respective follow-up questions, (2) missing statements, (3) possible statement contradictions, and (4) their views on electric vehicles (EVs) and public transport (PT) as alternative tourism mobility options.
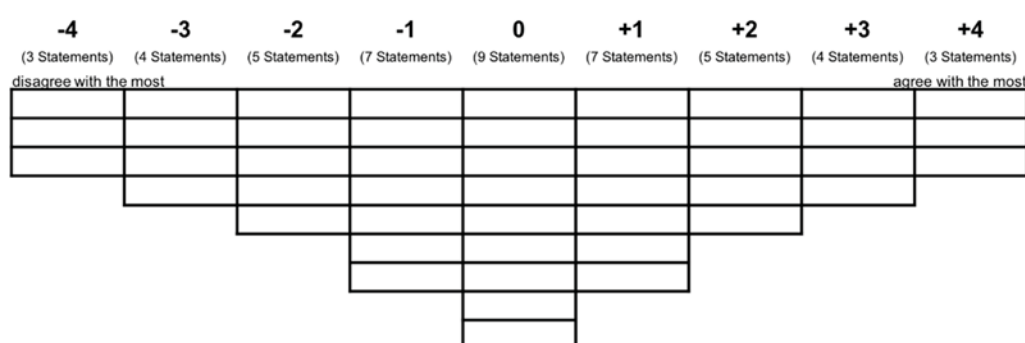

Figure 1. Model of the Q-sorting board.

2.4. Analysis of the Q Methodology and Interview Data

The data were analysed using Ken-Q Analysis Version 1.0.6, a web-based analysis tool. It applies a by-person (instead of a by-variable) factor analysis to retrieve themes shared by different groups of participants [59,62]. The first step is a Pearson's correlation of all of the entered Q-sorts [62] with each other, followed by a Principal Component Analysis applied to all 25 Q-sorts. The selection of factors to be kept for factor rotation followed both statistical and theoretical considerations [59,62]. We considered the eigenvalue of all of the factors (seven factors had an eigenvalue above one); the number of significantly loading Q-sorts per factor (four factors had at least two Q-sorts significantly loading on each factor), the shape of the scree plot (suggesting a three- or four-factor solution), as well as the theoretical significance of resulting factors. Ultimately, four factors were kept for the Varimax rotation. Afterwards, the factor matrix was generated, which illustrates how strongly each participant matches the viewpoints covered by each factor. To determine the significant Q-sorts for each factor, Q-sorts with loadings above $2.58 \times (1/\sqrt{N})$ (± 0.38) were considered significant at the 0.01 level [47]. To increase the statistical scrutiny and minimise the number of sorts to be excluded, the significance threshold was raised to ± 0.50 [55]. In the last step, the factor scores were computed, which show how strongly each statement scores on each of the factors (see Appendix A Table A1). The rough transcripts of the post-sorting interviews were analysed thematically, and the data were coded using categories that relate to the key insights of the statistical factor description, in order to be able to contrast both parts of the findings.

3. Quantitative Q Study Results

The results of this study stem from 25 Q-sorting interviews which were conducted with 13 female and 12 male participants between the age of 22 and 74 (average age: 42.5, median age: 39). Among the participants, five were students, 16 were employed, two were self-employed and two were retired. Eight participants lived in one of the inner suburbs, ten in one of the outer suburbs and seven in one of Christchurch's satellite towns. On average, the participants' households owned 1.03 cars per adult in the household (0.84 vehicles for the entire household). With regards to the memorable trips to predominantly rural, nature-based destinations, a number of different destinations throughout New Zealand were mentioned. They are visualized in Figure 2, below.
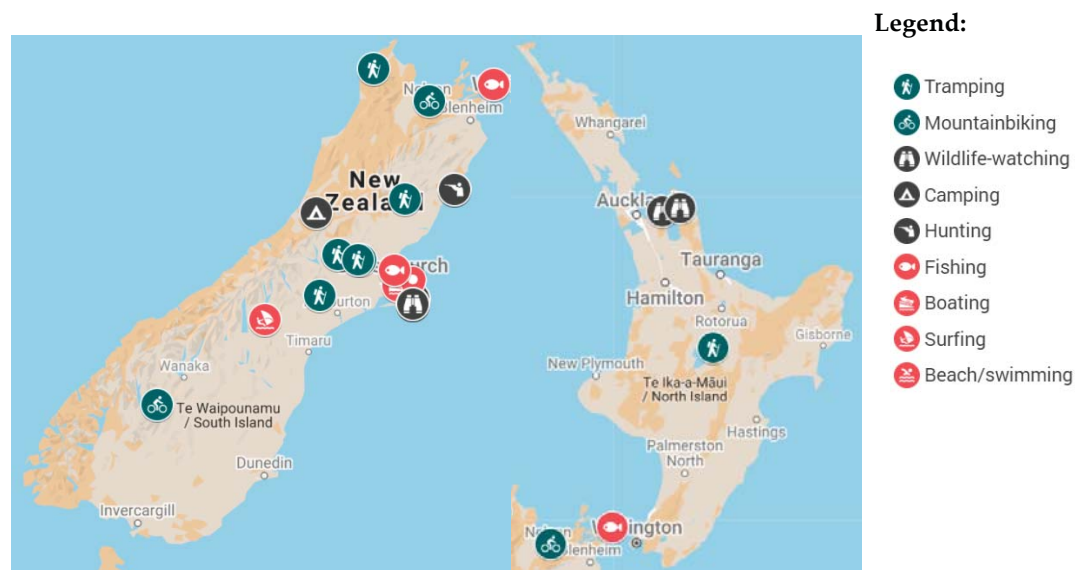

Figure 2. Memorable trips participants had in mind when sorting the Q statements and activities performed there (**Left**: South Island; **Right**: North Island). Map created using Google MyMaps.

The inverted factor analysis performed within the Q methodology reveals four distinct perspectives concerning the conceptions of or perspectives of Christchurch residents on their individual tourism mobility when travelling in New Zealand. These four groups are: (1) convenience-driven car proponents, (2) PT-affectionate multi-modal travellers, (3) EV- and PT-positive car dependents, and (4) those who are car-attached for stress avoidance. This four-factor solution accounts for 56% of the variance within the data. Table 3, below, shows the factor matrix of all of the participants, supplemented by personal and household characteristics. In total, 23 participants loaded significantly on one of the retrieved factors or viewpoints (indicated by an 'X' in the factor matrix), thereby exemplifying what this factor stands for [59]. None of the Q-sorts were confounded, but two Q-sorts did not load significantly on any factor. The reliability (and strength) of the final factor solution is commonly judged by the composite reliability, which increases with the number of defining Q-sorts, and will ideally be above 0.95, see [53]. The correlation values between the factors show that Factors 1 and 4 are fairly similar (0.55), and that Factors 2 and 3 share some similarities (0.42). This follows the line of argumentation of Britton [63], according to whom "the dynamics of tourism can only be fully understood with reference to its wider societal contexts". Consequently, individual choices must be observed with consideration of their broader societal framing.

Table 3. Rotated four-factor matrix with participant characteristics; 'X' indicates a defining exemplar.

Nr.	Personal Characteristics				Factor Scores (>0.38)			
	Sex, Age	Used Vehicles and Nr. of Cars Per Adult in HH [a]	HH Size [b]	HH Location	1	2	3	4
P17	Female, 39	4WD, EV (1)	2 + 2	outer	0.726X			
P23	Female, 30	SUV (0.5)	2 + 0	outer	0.683X			
P19	Female, 34	CC (2)	1 + 1	outer	0.681X			
P07	Male, 65	4WD (0.67)	3 + 0	outer	0.651X			
P01	Female, 71	CV, 4WD (3)	2 + 0	inner	0.644X			
P18	Male, 35	CC (2)	3 + 0	inner	0.627X			
P09	Male, 59	SUV, CV (0.67)	3 + 0	satellite	0.512X		0.436	
P24	Female, 23	NoC (0)	1 + 0	outer		0.766X		
P25	Female, 74	CC (1.5)	2 + 0	outer		0.710X		
P04	Female, 60	NoC (0)	3 + 0	satellite		0.696X		
P21	Male, 36	CC (1)	2 + 2	inner		0.637X		
P06	Male, 48	NoC (0)	2 + 2	inner	−0.427	0.548X	0.485	
P08	Female, 34	NoC, (CC) (0.5)	2 + 0	inner		0.532X		0.383
P11	Male, 39	EV, 4WD (1)	2 + 1	inner			0.784X	
P14	Male, 39	CV (0.5)	2 + 0	inner			0.665X	
P22	Male, 24	4WD (1.33)	3 + 0	satellite			0.648X	
P20	Male, 36	4WD (1)	2 + 0	outer			0.617X	
P10	Female, 47	SUV, CV (0.67)	3 + 0	satellite		0.405	0.557X	
P03	Female, 45	CV, EV (2)	2 + 2	satellite				0.734X
P05	Male, 36	CC (1)	2 + 0	outer				0.633X
P13	Female, 49	SUV, 4WD (1.5)	2 + 2	satellite	0.436			0.607X
P12	Female, 23	CC (1)	3 + 0	satellite				0.567X
P16	Male, 42	4WD, EV (1)	2 + 2	outer	0.478			0.500X
P15	Male, 34	SUV, CC (1)	2 + 0	outer	0.448			0.409
P02	Female, 43	4WD, EV (1)	2 + 1	inner				
	Eigenvalues				6.41	3.56	2.35	1.59
	% Explained variance				18	13	14	11
	% Cumulative explained variance				18	31	45	56
	Number of defining Q-sorts				7	6	5	5
	Composite reliability				0.966	0.96	0.952	0.952
	Standard error of factor scores				0.184	0.2	0.219	0.219
	Factor Correlation				1	0.31	0.35	0.55
					2	—	0.42	0.13
					3	—	—	0.16

[a] NoC = no car, CC = conventional car, EV = electric vehicle, 4WD = 4-Wheel-Drive, CV = Campervan, [b] Household (HH) size: adults + children.

Overall, the four factors share their desire for nature experiences, preferably in remote places, rather than city or cultural holidays. The importance of freedom and independence is another aspect ranked highly by all but one group. The frustration with car-dependency and the resulting need of a different transport system were unanimously placed in less decisive positions. Part of the reason might be that some participants generally consider PT to be a useful option, but not in rural places, leading to ambivalent feelings about this PT-related statement. This is also illustrated by the disinterest of participants in using car alternatives in the destinations themselves. On the other hand, there is a consensus that investments in car infrastructure and improved accessibility aren't desirable, often justified by people's interest in keeping remote places remote. The four factors are described below: the annotated numbers refer to their ranking (from −4 to +4) of the respective statement numbers. For example [S23: +3] means that this group ranked, in their ideal-type sort, statement 23 positively at position +3 on the Q board).

3.1. Factor 1—Convenience-Driven Motorists

For Factor 1, cars represent an essential part of their lifestyle, and they could not imagine travelling in any other way. Having the possibility to go to remote natural places, often for challenging physical activities, and stop along the road to explore things, is a substantial element contributing to the enjoyment of their leisure trips [S34: +4; S29: +4; S40: +3; S43: +4]. The group's mobility choices are very habitualized and convenience-driven. Without ever assessing travel options besides the car [S10: +2; S6: −2; S36: −4], they believe that PT is not a feasible option in NZ [S21: +3; S3: +2], which is undoubtedly related to them not enjoying any aspect of using PT (i.e., acquaintances or time to enjoy the scenery [S30: −2; S27: −3]). Driving, in turn, is considered practical, comfortable, independent and fun, especially in unfamiliar places [S32: +2; S25: −4; S26: −4]. Hence, while they do seek adventure, they want to be in control of the people surrounding them, as well as timing and routing. Overall,

this group is rather reluctant to use any new infrastructures or transport options, probably preferring things to remain roughly the same [S14: 0; S15: −1; S11: +1; S13: 0]. In their overall sorting choices, this group displays a pronounced 'me-perspective', ranking personal leisure and mode choice motives highest, while largely disregarding more societal or policy-related statements.

3.2. Factor 2—PT-Affectionate Multi-Modals

Factor 2 contains all four car-free households, which strongly shapes the group's viewpoints on leisure mobility. When travelling, they primarily seek relaxation through beautiful landscapes and nature experiences [S40: +3; S39: +3]. Driven by curiosity, they also look for meaningful interactions with others and activities related to local culture and self-improvement [S45: +2; S42: +3], preferably in unknown destinations [S38: −3]. Unlike all of the other groups, they have positive associations with PT and are above-averagely familiar with PT options. To them, travels by PT add to the tourism experience through the facilitated experiences. They enjoy the possibility for new acquaintances, relaxing rides watching the scenery, and not having to focus on the road, which has an element of stress and exhaustion for them [32: −2; 27: +4; 30: +2]. However, they dislike the dependency on other people and on public accessibility, as well as the planning needs and limited travel options that come with New Zealand's car culture, especially in the destinations themselves [S8: +2]. Unsurprisingly, they support the idea of a more attractive and comprehensive PT network, and wish to actively challenge the prevailing car culture [S11: +2; S23: −2; S16: −3], but are divided on opinions of environmental responsibility (and implications for governmental restrictions).

3.3. Factor 3—EV- and PT-Positive Car-Dependents

Factor 3 displays the most unique response pattern in terms of statement placement, with a strong concern for political and infrastructural issues. Largely driven by environmental concerns, people in this group mentioned the feeling of 'guilt' related to driving [P11, P14, P20], and consider car use reductions and the change of related cultural norms as a societal and political imperative [S19: +4; S18: −3; S13: −3; S16: +4]. While still using cars for convenience and necessity reasons, their viewpoints are reflected in their travel behaviour, including electric vehicle (EV) ownership [P11] or purchase considerations [P10, P20, P22], carpooling where possible [P22], and cycling [P14]. Despite their relatively positive PT attitudes [S27: +2; S37: +1], PT is not their transport mode of choice, especially not for trips within rural areas in NZ where they expect to experience freedom and flexibility [S21: +2; S7: −2]. They consider EVs to be the most attractive, but not yet affordable, alternative to conventional cars, and don't mind the involved planning needs, additional travel time and range limitations [S17: +4; S1: −4; S24: −1]. Car alternatives would be an interesting option, provided that they make sense for that specific trip [S10: −2; S6: −1].

3.4. Factor 4—Car-Addicts for Stress Avoidance

For Factor 4, cars represent practicality and a tool to facilitate their otherwise stressful lives. The purpose of their trips is to spend time with family [S44: +4], preferably in remote natural places [S46: +3; S40: +2], and having an uncomplicated and relaxing time while doing that [S44: +4; S39: +4; S41: −3]. While they don't actually enjoy driving overly much [S32: 0], they value the convenience of taking large amounts of bulky equipment (for sports, activities, kids or pets) and not needing to plan much. The car is the choice that minimizes their travel-related stress and, as such, is the only viable and practical option for this group [S21: +2]. Consequently, they don't see much point in changing NZ's car culture [S16: +2], and value personal freedom more than environmental concerns (and the resulting policies) in this respect. Unsurprisingly, the group has no interest in or experiences with PT [S9: −4; S36: −3; S8: −1], accompanied by strongly negative PT attitudes [S27: −4; S30: −4], again partly justified by the forced social interaction with strangers. Despite there being EV owners in the group, they don't consider it an option for leisure trips, which is again motivated by additional planning or trip complexity and range issues [S1: +1; S17: +1].

4. Qualitative Q Study Results on Factors Influencing Tourism Transport Mode Choices

This study investigated the different notions of Christchurch residents on tourism mobility choices and their interplay with the expected tourism experience. The underlying objective was to identify different perspectives regarding the perceived benefits and motivations of personal car use, and the factors inhibiting the use of alternative, more sustainable forms of tourism mobility. The identified themes will now be presented and complemented with the qualitative interview findings (the participant numbers of each quote are annotated in squared brackets).

4.1. The Notions of Automobility in Relation to Expected Tourism Experiences

The results of both the Q study and the subsequent interviews show that the type of expected tourism experience, the activities involved and the travel company strongly influence mode choices. In line with previous research on experiential tourism expectations, the Q results and the interview results identify a number of partly intersecting themes related to expected tourism experiences that relate to or motivate the tourism (auto-)mobility choices of the interviewed participants. These are: (1) the desire for private co-existence with family and friends; (2) the desire for solitude or the avoidance of unexpected encounters; (3) the wish for adventure and outdoor experiences; (4) a connection with, or an unspoiled experience of, the natural environment and sceneries by use of different senses; and (5) a desire for freedom, flexibility and control. These expectations relate to all of the stages of the tourism trip. It relates to the planning phase, where all hassles and stress ought to be avoided. It relates to the actual trip, which for some represents the start of joyful quality time with their travel groups, whereas others seek the enjoyment of natural landscape features. This enjoyment, including the palpability of the road, as well as the gaze of the surrounding landscapes, is often enhanced by the freedom to adjust the route whenever desired. Lastly, it also relates to the time spent at the destination, where automobility often enhances flexibility, privacy away from the crowds, and a sense of adventure from both the expected (including one's preferred leisure activity) and the unexpected; see also [9].

Activities, such as boating and hunting, involve large and often heavy gear, including sports equipment, toys or pet-related equipment. The statement that "the comfort of having a car like a giant suitcase is quite tempting" [P23] indicates that it may function as an extension of one's private garage, allowing for the full set of potentially pleasurable activities and the freedom to flexibly choose the most suitable one; see [20]. Nevertheless, alternatives to car travel were mentioned to enhance the experience for certain activities, namely hiking, mountain biking, kayaking (non-circular trips) and fishing (not much equipment). However, this was only mentioned by people with positive PT attitudes, who would be inclined to use them if the available offers matched their needs. For these groups, the current car dependence, despite its convenience effects, is largely caused by a lack of alternatives in terms of transport infrastructure; see also [64].

Some of the interviewed people perceive cars as a closed system where they can act and interact free of societal expectations and interactions. This expectation is line with previous findings on the desire of travellers and commuters; see the example of [65], from England, for private co-existence with family and friends rather than forced encounters with strangers [9]. Similar concerns around personal space have also been reported as a car use motive in the context of commuters. Within this theme, participants mentioned the pleasures of individual music and temperature choices, traditional family food stops, and other family rituals that have tied automobility to a pleasurable and memorable aspect of the family holiday. For this reason, the majority of people consider PT, in its reliance on consolidation effects, as the antithesis to what they look for in a leisure trip: privacy, remoteness, and freedom.

While, for certain leisure activities, the tranquillity related to remote places was a required (bird-watching, hunting) or fundamental part of the enjoyment (trekking), most people simply found it pleasurable to only be surrounded by nature, family and close friends. The desire for remoteness was somewhat perceived as a 'Kiwi right', but also represents a fundamental expectation for travellers in other places, such as peripheral Swiss mountain areas [29]. As such, not even convinced car travellers

(factors 1 and 4) supported the expansion of transport infrastructure into remote areas because these places "need that natural limitation" [P12] and would otherwise "lose a bit of magic" [P5]; see also [29]. For most of the participants, the attachment to remote places was closely related to the need for freedom and independence in transport modes. Participants noted that "freedom is a big thing for Kiwis, they want to be able to just spontaneously go" [P10]. Partly, this is justified by the characteristics of certain leisure activities (i.e., weather-dependent sports) as well as the importance of being "in control of our own timings" [P13] that benefit from flexibility. This desire for freedom is strongly tied to the necessity of automobility [12]. It reflects the individualist traits related to car usage, allowing people to act more upon personal preferences and attitudes than societal considerations [32,66].

For some, but very few, participants (mainly of group 2), automobility was associated with feelings of fear and distress. This was mentioned either in relation to the personal discomfort of driving in general or in unknown places, and also in relation to external and often unplannable traffic and weather conditions. This aspect has already been discussed by Sheller [67], who highlights the apparent paradox of cars being associated with freedom, when congestion and traffic regulations may actually be quite the opposite of freedom. Most people, however, cannot relate to this "mental bondage" of automobility because they enjoy driving and value their privacy higher than arrival times or travel speeds. For these type of travellers, the sensual enjoyment of the trip and the landscapes is much more associated with bus and train trips, where "my mind can wander, I get there in the end without having to think about it" [P4], an experience shared by travellers in previous studies [35].

4.2. The Notions of Automobility in Relation to Urban Mobility Cultures and Sustainability Aspects

People's leisure transport mode choices are not disconnected from their daily transport choices. They establish habits in their daily life which travel with them on leisure trips, as already mentioned previously, see [9]. Unsurprisingly, most participants commented on how Christchurch's transport network encourages car dependence. Furthermore, the oftentimes-poor PT supply in rural areas [58], especially in NZ, represents a constraint for PT use. Especially for car-free households, the existing infrastructure represents a strong limitation, and their travel plans are largely influenced by the question "Is it reachable for us?" [P6], often resulting in either dependency on other people or rental cars. As already highlighted by Fitt [4], habitus strongly affects which options are even considered viable by travellers. Some people (especially those in groups 2 and 3) don't necessarily oppose PT use; it is simply not in their mind or awareness spectrum as an actual alternative to be considered.

From the personal embeddedness in such a choice-restricting automobility culture follows a moral dilemma or attitude-behaviour gap for some more environmentally-conscious participants in groups 2 and 3, as illustrated here: "What I struggle with is picking the difference between what I actually do and what I do in my ideal reality" [P22]. Often related to the feeling of guilt, this dilemma illustrates strong social norms towards environmental protection [68,69]. As the share of environmentally conscious people in New Zealand increases [70], this effect can be expected to grow. For now, however, some study participants expressed frustration: "Somehow, the car has gained this magic status that is not allowed to be touched" [P11]. This status-quo bias is a strong decision-driver, and it affects which type of political action is societally acceptable.

While status related to transport modes was unanimously considered unimportant for travel choices within the Q study, it was frequently mentioned in the qualitative interviews; for example, by stating: "I'm a big guy and I don't wanna look like a giant sitting inside" [Q21]. As "loser cruisers" [P7], buses were associated with people of low social classes who cannot afford a car. This is in line with Fitt's [4] study, where people mentioned the low status associated with buses, while at the same time stating that this wouldn't affect their personal choices. Buses were unanimously seen very negatively among all factors. However, diverging from the findings of Fitt's study, participants frequently justified their negative connotations by relating buses to safety concerns. Based on these concerns, people would also discourage family members from using them, highlighting the influence of peers and parents on mobility choices [36,71].

Train travel, on the other hand, enjoyed a better reputation across Factors 1 to 3, partly caused by people's own experiences using trains when travelling abroad. Electric vehicles (EVs) were seen as the most positive alternative to conventional cars, associated with progress and the fun of driving. Besides stigma, other constraints to using PT included the perceptions that it is slow, costly, complicated in terms of planning, and limiting in terms of destination and route choices. Especially, across Factors 1 and 4, the discomfort of having to engage in "(. . .) forced interactions, sitting beside somebody unknown in a bus" [P23] is a considerable limitation. Social interaction is perceived more positively among people in Factor 3 and especially Factor 2, suggesting that personality features (i.e., introversion) affect people's willingness to use PT. Hannam et al. (2014) also points out that the choice for a car is often choice against other transport modes. As highlighted by Collin-Lange and Benediktsson [72], Icelandic novice drivers frequently dismissed other travel options that they considered inferior because of perceived unreliability, lower availability or perceived safety concerns, which matches the findings of this study.

5. Discussion and Conclusions

5.1. Policy and Planning Implications for Sustainable Tourism Mobility

New Zealand's Ministry for the Environment has, as part of the country's adherence to the Kyoto Protocol and the United Nations Framework Convention on Climate Change, set both international and domestic greenhouse gas emission targets [73]. While it is on track for its 2020 targets of reducing emissions by 5 per cent compared to 1990 levels, its domestic targets are much more ambitious. As part of 2019's Climate Change Response Amendment Act, the government set into law the domestic target of being net emission free by 2050, see [74] for more details. As part of this, a NZ Emission Trading Scheme was implemented in 2008, which has also covered the transport/liquid fuel industry since 2010. Nevertheless, emissions from private transportation have risen constantly since 1990, partly caused by the increase in vehicle kilometres and supported by the lack of vehicle emissions standards.

Both in terms of infrastructure and mobility practices in New Zealand, there appears to be no default setting towards PT in general, and rail travel specifically. For New Zealand to meet its decarbonisation goals, simultaneously implemented financial, legal, infrastructural and socio-psychological (dis-)incentives are needed. Policies should also target the Christchurch transport system, given the influence of daily practices in determining tourism-related practices. Presumably, such political efforts would be challenged, given the strong societal values of the 'Convenience-driven motorists' and the 'car-addicts for stress avoidance'. For more PT-affective car users, such as the 'PT-affectionate multi-modals', it may be worth reinforcing the positive qualities of PT and the moral obligation to travel more sustainably where possible [75,76].

Expanding bus travel seems impracticable, with some minor exceptions (i.e., non-circular hiking tracks). A revival and expansion of the existing train network, however, was viewed more positively, and even considered a necessity for commutes in and out of Christchurch. Personal preferences related to the values of strongly individualist societies as is NZ—see [77]—must be taken into consideration in planning. In that context, transport operators should prioritise people's comfort and need for privacy and personal space over high vehicle occupancy when designing PT [78]. For rural travel, a train network strongly relies on flexible, most likely car-based travel options at the destination itself, although the walkability of destinations has been shown to facilitate PT use [25]. Assessing possible PT business models and respective demand patterns would be a necessary step, within which a strong emphasis should be placed on the experiential expectations of tourists in situ and en route (see Hannam, 2014). In connection to this, a combination of train and bike travels might be a worthwhile consideration which can fulfil the desire for remoteness, solitude and flexibility while also reducing long-distance transport emissions. However, given the current infrastructural settings and habitual practices, any substantial investment in passenger rail would represent a considerable change in direction for NZ transport policy.

Besides PT, EVs were seen as an attractive and somewhat sustainable alternative to conventional petrol cars by participants (especially in Factor 3), despite people's awareness of battery production and disposal issues. The largest concern related to tourism travel by EV was believed to be the limited range of the more affordable vehicles. By increasing the awareness of existing charging infrastructure density (using existing apps, for example) and incentivizing local or national sharing schemes using long-range EVs, policy-makers could address people's range anxiety and fear of losing control.

5.2. Conceptualising Factors Influencing Tourism Mobility Choices

The statements of the Q study, as well as the results derived from it, largely draw on the concepts of mobility cultures, the study of tourism (auto)mobilities, and findings from classical mode choice models. These three scholarly strands provide a good analytical lens for the identification of the various aspects affecting notions of automobility and related tourism mobility choices. While research (especially in positivist statistics-based fields, such as tourism and transport economics and management) often illustrates these different factors as isolated determinants [79], we would like to suggest an integrated and interconnected conceptualisation of the different dimensions affecting these choices (see Figure 3). This follows the line of argumentation of Britton [63], according to whom "the dynamics of tourism can only be fully understood with reference to its wider societal contexts". As a result, the broader societal framing must be taken into consideration when studying individual (tourism mobility) choices. The illustration in Figure 3 is based on the following arguments: first, individual agency with regards to tourism mobility is limited by the importance of structural surroundings. This refers to intrapersonal factors (i.e., family travel preferences, experiential expectations), societal and political factors (i.e., individualism and related policy debates), and the materialized infrastructure and spatial form (i.e., rural accessibility by road and PT). Second, this understanding presupposes an embedded structure of all dimensions with various feedback loops between them. Third, it reflects the hierarchical nature of the different dimensions. We are aware that this visualization, with its evenly-spaced and embedded spheres, cannot match the full complexity of reality. The order of the circles was chosen not to elect the individual as the central and most important element of our analysis, but to illustrate our understanding of the individual's limited agency and dependence on surrounding structures. We consider this a more realistic way of looking at the interconnectedness of the different spheres that shape current social tourism mobility practices.
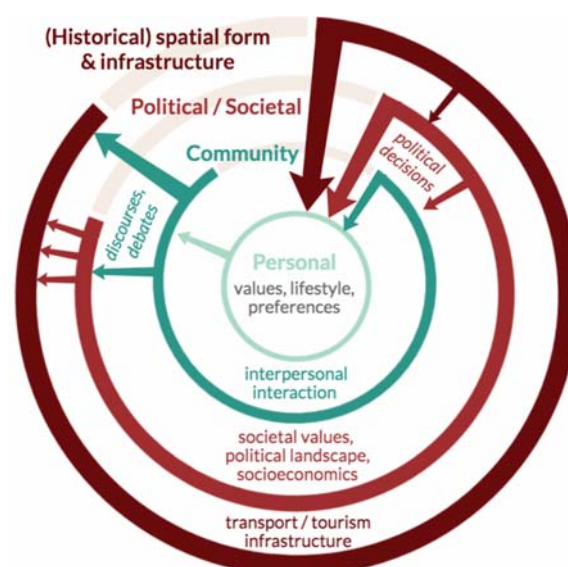

Figure 3. Relationships between the factors determining mode choices in tourism contexts.

The analysis of all four of the identified factors and the qualitative study of the post-sorting interviews revealed several influential factors on mode choice in the tourism context. They suggest that certain instrumental factors affect mode choice considerations. While costs and time appeared as minor factors, the type of expected leisure activities and the related equipment requirements were mentioned by many respondents, especially those travelling with children.

On a more personal and interpersonal level, the experiential expectations of the tourism trip appeared as influential factors both throughout the Q-sorting and the post-sorting interviews, and they diverged between different groups. This included people's desire to find remoteness and solitude (as opposed to crowdedness and encounters with strangers) in visited places, with privacy and family time as a key aspired experience. Escaping societal expectations and feeling at home while travelling adds substantially to the enjoyment of some of the interviewed travellers, largely driving automobility developments. What is more contested is the notion of freedom, independence and fun associated with car travels. While some people perceive automobility as the definition of freedom and independence, and largely enjoy being on the road, others feel stressed by the dangers and exogenous factors (weather, traffic), perceiving the peace of mind and the lack of responsibility during train trips as pure freedom and independence, which is an insight that matches previous studies [9,33].

On a societal and cultural level, social stigma around certain bus use was frequently mentioned, despite respondents denying its relevance in shaping personal mode choices. The results, however, question this notion, and assume a relationship between social stigma and personal decisions based on previous findings [4]. For electric vehicles, social stigma was much less of an inhibiting factor, since they were perceived as progressive, fun and interesting. With regards to EVs, most concerns were of a more instrumental nature, addressing range anxiety, the costs of initial investments, and uncertainties regarding future technological developments and related changes of policy objectives.

On an infrastructural and political level, the results reveal the limitations of existing transport infrastructure, both in Christchurch and rural tourism destinations. Existing structural and societal lock-in effects are accompanied by a reluctance to change, and also by a pronounced habitus towards automobility where alternatives to the private car are simply not considered, no matter the personal values, attitudes and preferences. Given the increasing environmental pressures and calls for a post-carbon future, policy-makers might experience an increasing pressure for alternative technological configurations that they ought to bring in accordance with a continued demand for comfort and convenience from the part of individual travellers, where train or coach travel are perceived as a downgrade. Finding smart and appealing solutions to this conflict of interest might be a core responsibility of policy-makers, transport planners and destination management.

Based on this conceptualisation and these results, we argue that future research should try to further bridge the gap between transport work in tourism that has often taken a largely positivist and deterministic approach, and research drawing more from social practice theories and the mobilities paradigm. Mobilities scholarship emphasises nuance, complexity and fluidity [80,81], and social practices approaches focus on the above proclaimed interconnectedness of the different elements of social life [82]. Furthermore, studies on lifestyle mobilities have highlighted that the increasing importance of physical travelling (or so-called 'corporeal mobility') in times of increasing possibilities of digital exchange has become less of a necessity, and more a matter of lifestyle choices, with choices becoming more dynamic and complex [83]. This research has found that increasing the inclusion of these perspectives would be beneficial in future explorations of mode choice for leisure trips.

5.3. Limitations and Conclusions

Unfortunately, the Q Method, based on its structured (and not random) sampling approach, does not aim at retrieving the exact allocations of these retrieved typologies within society; therefore, it does not allow for generalizable results across larger populations [53]. Further research using different methods will be necessary to retrieve generalizable, and therefore more policy-directed, results. Furthermore, given that all of the study participants lived in Christchurch, the variance in viewpoints

regarding the transport infrastructure and the built environment was low. Further studies should consider applying this Q set to a larger cross-cultural sample within different geographical settings in order to retrieve a broader understanding of views on the effect of the existing built environment on travel choices.

Despite this limitation, the paper makes various academic and practical contributions. Theory: the conceptual model contributes to the wider understanding of interconnected influences on notions of automobility and personal tourism mobility choices, and can help to determine the study focus of future research. Methodology: considering the limited agency of individuals within tourism mobility practices, this study contributes to the growing awareness of combining both qualitative and quantitative methods in the methodological design of future research when aiming for an understanding of travel practices and motivations. Policy: this study—when combined with similar studies—may provide Christchurch transport policy makers with a clearer picture of the complexities and experiential expectation of tourism mobilities, as well as the various psychosocial factors affecting behaviour change, which need to be addressed in order for policies to be successful and accepted. The insights from this study may also be applicable to similar cities in New Zealand, and possibly further afield. Planning: this study contributes to a wider body of literature that can help destination managers better understand the various factors along the trip chain that need consideration when wanting to increase the car-free or fossil-free accessibility of leisure destinations. While focusing mainly on the Christchurch area, these insights may still add to a wider 'toolbox' that planners can select from and adapt when seeking to make changes that are relevant to their own specific context and circumstances.

Appendix A

Table A1. Q statements and standardized factor scores on the extracted four-factor solution.

No.	Statement	Score by Factor			
		1	2	3	4
	3—Infrastructure				
1	EVs aren't really an option for longer trips yet because the range and charging infrastructure aren't sufficient.	0	−1	−4	1
2	I have already explored the options of travelling with an EV for myself.	−1	−1	1	1
3	With the current train and bus infrastructure, it seems impossible to travel around NZ without a car.	2	1	0	1
4	I specifically look for places that have a good amount or accommodation, food and drinking options.	−2	0	−3	−2
5	A broad visitor infrastructure, like tramping and mountain bike trails is very important for my leisure trips.	2	−2	3	0
	4—Travel Behaviour				
6	I just use whatever mode of transport is most practical, so I re-assess that for every new leisure trip.	−2	3	−1	3
7	Once I arrive at my holiday destination, I prefer to move around without my car.	0	0	−2	0

Table A1. *Cont.*

No.	Statement	Score by Factor			
		1	2	3	4
8	I would love to take a relaxing train or bus to my destination, but I need a car there to visit the places I want to see.	−1	2	2	−1
9	I have already tried traveling to rural places in NZ by train or bus.	−1	0	0	−4
10	I don't think too much about how to travel somewhere for leisure; I just use my car wherever I go.	2	−4	−2	1
5—Policy Discourses					
11	The government should invest more money in establishing a comprehensive public transport network.	1	2	4	−1
12	The government should invest in alternatives like EV infrastructure.	1	0	3	2
13	NZ is too sparsely populated to build an attractive train or bus network.	0	−2	−3	0
14	The government should invest in a more efficient road network to decrease congestion and facilitate traveling.	0	0	−1	−1
6—Problem/Environmental Awareness of Tourism Mobility					
15	We should have a transport system which dissuades people from using cars, even in rural areas.	−1	−1	0	−2
16	NZ is built around cars, especially in Christchurch. Changing that wouldn't work.	0	−3	−4	2
17	I think EVs are attractive for leisure trips, too; if you just plan it well enough.	0	−1	4	1
18	Everybody should just do whatever works best for them. And if they like driving, they should be able to do so.	−1	1	−3	−1
19	Everybody should feel responsible for the environment and should try to drive their cars less.	0	2	4	1
20	I'm more concerned about the environment than most people and that affects how often and how I travel for leisure.	−1	0	1	0
7—Instrumental Mode Choice Motives					
21	I don't think the outdoor places that I like to visit are accessible without a car.	3	−2	2	2
22	I usually have a lot of bulky equipment with me that I wouldn't want to transport without a car.	1	−3	2	3
23	If traveling by car got significantly more expensive, I would reconsider using other transport modes for leisure trips.	−3	−1	0	−1
24	Door to door travel time plays an important role in my choice of transport mode for leisure trips.	1	1	−1	1
25	I find driving longer distances by car very exhausting because I need focus on the road so much.	−4	−2	−1	−2
26	I dislike driving in unfamiliar places.	−4	−4	−3	−2
27	Going by bus or train gives me time to read, nap or enjoy the scenery, which I enjoy a lot.	−3	4	2	−4
8—Symbolic-Affective Mode Choice Motives					
28	The cars people drive reflects who they are and what they spend their leisure time with.	−1	1	0	0
29	Having the freedom to stop along the way whenever I want or change my plans spontaneously is what makes travelling fun.	4	4	1	4
30	In the train or bus, you sometimes meet nice people. I enjoy that a lot. The car is much more lonesome.	−2	2	−1	−4
31	Going on holidays by bus or train seems a little odd to me.	−2	−3	−2	0
32	I simply love driving by car and really enjoy time on the road when going on longer trips.	2	−2	−1	0
33	I am a dedicated follower of the four-wheel-credo. I wouldn't want to travel anywhere without my car.	−3	−4	−4	−2
9—Other Determinants of Leisure-Related Transport Mode Choices					
34	I like to do my own thing when travelling and not depend on others or timetables.	4	4	1	3
35	It annoys me sometimes that I'm so dependent on my car to get to cool places in the outdoors.	0	0	0	0
36	I know exactly, which rural places I can reach by bus and transport and how to do so.	−4	0	−1	−3
37	For the type of activities I like doing, having alternatives to the car would sometimes be more practical.	−3	0	1	−1
38	I prefer going to places that I've already been to and where I know my way around.	−2	−3	0	0
10—Travel Motives					
39	When traveling, all I want is to relax and forget about the stress of every-day life.	1	3	−2	4
40	I am primarily looking for nature experiences and beautiful landscapes when traveling in New Zealand.	3	3	3	2
41	When going on leisure trips, I need adventure and challenging experiences.	3	1	2	−3
42	I always want to try and learn new things to improve myself, also when I'm travelling.	2	3	−2	−1
43	Physical activities and sports are a very important part of the leisure trips I do in New Zealand.	4	−1	3	2
44	The main reason to travel for me is to spend time with my family and friends.	1	−1	0	4
45	Travelling in New Zealand to me means experiencing and understanding the local culture.	0	2	0	−3
46	When I head out of Christchurch, I love to visit remote rural places where there are not many other people.	3	1	1	3
47	Showing my friends or family the diversity and heritage of New Zealand is one key reason for me to travel.	1	1	1	−3

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CONFERENCE OR SEMINAR PRESENTATIONS OF PAPERS

Paper I   Juschten, M.; Unbehaun, W.; Jiricka-Pürrer, A.; Czachs, C.; Brandenburg, C.; Prutsch, A.; Offenzeller, M.; Weber, F.; Rosenberg, B. (2017): *Renaissance der Sommerfrische in Zeiten des Klimawandels?* 12th Climate Day, Vienna, Austria.

Paper II   Juschten, M. (2017). *'Sommerfrische' as a strategy für climate change adaptation in tourism?* Member assembly of the LEADER region Pongau, Schwarzach, Austria [as invited speaker].

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Paper IV   Juschten, M. (2018). Soc*iodemographic, psychological and spatial patterns of tourism mode and destination choices of Viennese households.* Hochschultagung Verkehrswesen, Obergurgl, Austria.

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Paper V   Juschten, M.; Hössinger, R. (2020). *Out of the city – but how and where? A mode-destination choice model for urban-rural tourism trips in Austria.* BTR 2020: Bridging Transportation Researchers Conference, Online participation.

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Paper VI   Juschten, M.; Page, S.; Fitt, H. (2020). *Mindsets set in concrete? Exploring factors influencing New Zealand's (auto-)mobility culture in the tourism context using Q-methodology.* NZGS 2020: Biannual New Zealand Geographical Society Conference 2020, Wellington, New Zealand.

ABOUT THE AUTHOR

Maria Juschten was born on 15 September 1988 in Dresden, Germany. Inspired by previous travels and international trade movements, she started a dual study program in 2008 combining theoretical studies of Transport Economics and European Studies at the Berlin School of Economics and the Hague University of Applied Sciences with continuous rotations to different branches of the Deutsche Bahn Holding. After graduating from her BA in 2011, she took a gap year aiming to follow her curiosity for far-away places.

Thereafter, she moved to Sweden to obtain her MSc degree in Human Geography from Lund University (2014, with distinction) and to Austria to pursue an MSc in Socio-Ecological Economics and Policy at the Vienna School of Economics and Business (2015, with distinction). Her first MSc project focused on attitudinal factors within the Theory of Planned Behavior and their influence on travel mode choices in Vienna. Taking the perspective of both ecological and economic sustainability, her second MSc project empirically investigated the mechanisms leading to corporate growth and the counter-strategies of growth-neutral firms in Austria. The thesis was shortlisted for GAIA Masters Student Paper Award, resulting in a subsequent publication as a journal article within the sustainability-oriented journal GAIA.

In 2017, after two years of working as a research assistant at the University of Natural Resources and Life Sciences (BOKU), Maria inscribed in BOKU's PhD program in Economic and Social Sciences in parallel to conducting work in various research projects related to sustainable mobility. One of these projects, called 'REFRESH' ultimately lead to this cumulative dissertation. Since starting her PhD, Maria has published in international peer-reviewed journals, presented at international conferences (one of which she co-organized) and received several scholarships allowing her to connect and cooperate with researchers abroad (2018: Michigan State University, United States; 2019: Umea University, Sweden; 2019-2020: Lincoln University, New Zealand). In terms of teaching experience, Maria has taught in one bachelor's course at BOKU and co-supervised two Master's theses. Still excited about transportation with its continuously changing technologies and their impact on people's attitudes and mobility patterns, Maria aims to continue in research-related positions for now.

DECLARATION OF AUTHORSHIP

I hereby declare that I am the sole author of this work; no assistance other than that permitted has been used, and all quotes and concepts taken from unpublished sources, published literature or the internet in wording or in basic content have been identified by footnotes or with precise source citations. I am aware that offenders may be punished ('use of unauthorized assistance') and that further legal action may ensue.

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