

# **THE TECHNOLOGY-EVOKED TIME USE REBOUND EFFECT AND ITS IMPACT ON CONSUMER BEHAVIOUR IN TOURISM**

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## Abstract

### *The technology-evoked time use rebound effect and its impact on consumer behaviour in tourism*

Soheon Kim

Technological solutions to achieve energy efficiency and reduce tourism's carbon footprint are unlikely to be sufficient alone. This is because monetary savings caused by energy efficiency improvements can, rather unexpectedly, lead to increased energy demand, the phenomenon known as the rebound effect (RE). Time savings from time efficiency technologies can similarly intensify energy consumption, leading to the so-called time use rebound effect (TRE). Efficiency improvement technologies have been employed in tourist transport to save energy and reduce costs and time of travel. Such technologies have allowed tourists more discretionary time to spend, which can intensify energy consumption, thus leading to the potential TRE. Evidence suggests that the (T)RE in tourism can be high but its understanding is limited, therefore calling for an in-depth exploration of the issue. The aim of this study is to investigate the implications of the technology-driven RE in tourism, especially with respect to time, for tourist consumption behaviour in the context of more environmentally sustainable tourism. The (T)RE is conceptualised following the literature review, encapsulating the relevant variables. Using an exploratory sequential mixed methods strategy, this study explores the rebound issue in the holiday context qualitatively with a small sample of study participants and then to develop and test instruments with a larger sample.

The findings from semi-structured interviews reveal that tourist perception/attitudes towards time on holiday are contextual and are influenced by some key factors: unfamiliarity, usual demands, emotions/time awareness and lack of time pressure. The experiences and environments of travel to/from a destination affect how tourists perceive en-route travel time. Survey findings suggest that time savings from faster travel technology can result in tourists' behavioural changes, i.e. TRE. A range of potential TREs occur depending on such factors as socio-demographic characteristics, holiday preferences and availability of time and money. Tourist time perception/attitudes as well as time use patterns on holiday are another key factor to influence behavioural changes due to the time savings. Three groups based on psychological values and time use patterns on holiday are identified: the Busy explorer, the Travel time lover and the Quality time seeker. The Busy explorers are most likely to show the potential TRE in most aspects amongst all groups, with implications for increased environmental impacts. They are represented by younger, full/part time committed people or students, who experience time constraints relating to holiday trips.

Based on the findings, the initial conceptual framework of the (T)RE has been refined. The resultant framework can aid in understanding the occurrence of the RE in tourist consumption highlighting the key drivers, influential factors and the key forms of the (T)RE. Suggestions for future research are outlined concerning how to better understand tourist behaviour and to integrate the role of (T)RE in tourism studies for (more) sustainable tourism development.

## List of Abbreviations and Acronyms

|       |                                                        |
|-------|--------------------------------------------------------|
| ABTA  | Association of British Travel Agents                   |
| CGE   | Computable General Equilibrium                         |
| DECC  | Department of Energy & Climate Change                  |
| EASA  | European Union Aviation Safety Agency                  |
| EEA   | European Environmental Agency                          |
| EEIOA | Environmentally Extended Input-Output Analysis         |
| GHG   | Greenhouse Gas                                         |
| GIS   | Geographic Information System                          |
| GPS   | Global Positioning System                              |
| IATA  | International Air Transport Association                |
| ICT   | Information and Communications Technologies            |
| IOA   | Input-Output Analysis                                  |
| LCA   | Life Cycle Assessment                                  |
| LCC   | Low-Cost Carrier                                       |
| MTO   | Maximising Limited Time by Doing Many More On-Site     |
| OECD  | Organisation for Economic Co-Operation and Development |
| ONS   | Office for National Statistics                         |
| PCA   | Principal Component Analysis                           |
| PTP   | Perception of Time Passing on Holiday                  |
| PTT   | Perception of Travel Time for Holiday                  |
| QT    | Quality Time On-Site                                   |
| RE    | Rebound Effect                                         |
| STO   | Scheduled Time and Temporal Flexibility On-Site        |
| TRE   | Time Use Rebound Effect                                |
| (T)RE | Rebound Effect and Time Use Rebound Effect             |
| TTE   | Time Use and Transport Behaviour En-Route              |
| TTO   | Time Use and Transport Behaviour On-Site               |
| UNWTO | United Nations World Tourism Organization              |
| WTP   | Willingness to Pay                                     |

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## **Author's declaration**

The contents of the literature review (Chapter 2) have been published as a journal article. The findings of the interviews have been published in conference proceedings. These are acknowledged in the text where appropriate and listed in Appendix 23.

# Chapter 1. Introduction

## 1.1. Research rationale

Increasing number of studies and policies have focused on sustainable tourism development due to the industry's growing natural resource requirements and accelerating greenhouse gas (GHG) emissions (Scott et al. 2016). These studies and policies are underpinned by Gössling et al. (2010), Hall (2013), Hall et al. (2015), Kim and Filimonau (2017), the United Nations World Tourism Organization, UNWTO (2018) and Organisation for Economic Co-operation and Development, OECD (2020a), for instance. Technological interventions have been acknowledged as an important driver of energy efficiency improvements in tourism (Pratt et al. 2011). The policy interventions underpinned by technological solutions have been designed to reduce the energy and carbon intensity of tourism (Aall 2014). These interventions have been set on the economic rationality that the adoption of technology in tourism decreases its energy consumption without having to change consumer behaviour (Sorrell 2015).

However, such solely technology-focused solutions have not always been successful because they fail to sufficiently reflect upon how they might change tourist behaviour (Miller et al. 2010). As a result, the policy interventions underpinned by energy efficiency improvements facilitated by technology tend to overestimate the energy saving potential and underestimate energy conservation costs which are closely related to consumer behaviour (Binswanger 2001; Moshiri and Aliyev 2017). The key question is whether the actual energy efficiency gains correspond to the anticipated amount of energy savings as economic theory suggests this is not always the case due to often unanticipated changes in consumer behaviour (Sorrell 2007).

Since energy efficiency improvements imply a cost reduction for energy services, corresponding behavioural responses may occur, often leading to increased consumption and thereby offsetting estimated savings. This is often referred to the rebound effect (RE) (Greening et al. 2000). For instance, the money saved on fuel by driving a more fuel-efficient car can be used to drive this car further and/or more often, or be spent on consumption in other energy-intensive contexts, such as taking an overseas holiday (Chitnis et al. 2013). This fails to deliver the anticipated energy reductions and can even result in some undesired consumption effects.



Taking a step back to look at the RE in general aspects, it can refer to some or all of the expected reductions in consumption being offset by consumer responses. It often describes the demand which bounces back, usually unexpectedly (Hertwich 2005). As an example, as the COVID-19 lockdown restrictions were eased, consumption of foodservices and holidays was shown to rebound (BBC 2020a). That is, the RE can occur not only in relation to energy efficiency improvements, but also due to other major interventions such as policy changes, disasters and crises, acts of government and so on. Nevertheless, the RE was first conceptualised in the field of energy economics and subsequent empirical evidence was collected hereby to demonstrate the RE might be significant (Wang et al. 2016). Notwithstanding the relevance, scientific debate on the RE outside energy economics in fields such as tourism has hardly occurred to date (Santarius 2012).

Optimism of sustainable prospects of future tourism, based solely on technology-evoked energy efficiency improvements, is questionable given the general failure of many sustainability evaluations in tourism to consider the RE (Hall 2013). Technological improvements are paradoxically a contributor to continuing tourism growth. Not only do they increase the number of tourists, but also enable tourists' access to more delicate and remote environments (Sharpley 2000). Although research indicates that the RE can occur in tourism regardless of whether explicitly referring to the RE (Gössling et al. 2013; Hall 2013; UNWTO 2014; Hall 2015; Hall et al. 2015; Shuxin et al. 2016; Filimonau et al. 2018; Wang et al. 2018), no research has been carried out to identify how the potential gains driven by technological improvements (e.g. carbon savings) could be offset by unexpected changes in consumer behaviour in tourism (Kim et al. 2020).

Tourist behaviour has been repeatedly acknowledged as a key aspect to consider in promoting (more) sustainable tourism development (see, for example, Kang and Moscardo 2006; Budeanu 2007; Lee 2011; Kim and Filimonau 2017; Dolnicar et al. 2019). As an effort to substantially reduce the negative environmental impacts of tourism such as its carbon emissions, an approach to induce voluntary behavioural changes of tourists has been adopted such as voluntary carbon-offset schemes for flights (Mair 2011) or voluntary opting out of daily room cleaning in a hotel (Dolnicar et al. 2019). However, voluntary behavioural changes in terms of tourist consumption are

often considered unrealistic, where studies claim that such approach is insufficient alone (McKercher et al. 2010; Higham et al. 2016) or ambiguous (Gössling et al. 2007) for sustainable tourism management. Voluntary changes can further be complicated by the impacts of the RE.

In tourism, the RE beyond pure energy efficiency is also of prime relevance. This concerns the patterns of time use by tourists, for example. Technological changes that save time influence energy consumption and trigger the RE as many time-saving technologies in tourism (such as, for example, faster modes of tourist transport) require larger energy inputs (Sorrell and Dimitropoulos 2008). Of particular interest is the time use rebound effect (TRE) which evaluates the impacts of time-saving technologies on time use and energy consumption (Binswanger 2001). However, very little empirical research has been undertaken on the topic of TRE to date, with most being concerned within the household domain only (Brenčić and Young 2009).

In the context of environmentally sustainable tourism, time-saving technologies have implications for tourist travel behaviour and the related activity patterns. This is because time is a necessary pre-condition to engage in any tourist activity (Gołembski and Niezgodna 2012), but also a cost in terms of travelling (to and from destinations) (Jacobsen et al. 2018). Time is limited and thus has become a precious resource for consumers living in increasingly busy lifestyles. Increased consumption of air travel and, subsequently, tourism can potentially be driven by time efficiency gains, i.e. more time (Sorrell 2007). Time is an important concept in tourism studies and its application varies depending on trip purpose, social context of travel or cultural background of tourists (Hall 2005; Dickinson and Peeters 2014; Pearce 2020).

Efficiency gains in terms of time in addition to energy are increasingly recognised as a driver of consumer behaviour in the context of sustainable development in tourism (Gössling et al. 2010). While Hall (2015) underlines the importance of accounting for the impacts of these efficiency gains on tourist consumption, the tourism research agenda on the RE in general and the TRE in particular remains under-developed (Kim et al. 2020). Evidence from the sectors outside tourism such as the household energy consumption sector (see, for example, Jalas and Juntunen 2015; Wiedenhofer et al. 2018) calls for re-evaluation of the use of time in the context of tourist consumption and implies the need for a critical analysis of the (T)RE in the context of tourism.

This study therefore employs the concept of the RE to develop an innovative approach to studying sustainability challenges in tourism and explores the time dimension with respect to rebound consumption. The study firsts consider the role of time in the RE and examines the TRE in the context of sustainable tourism, specifically exploring changes in consumer behaviour. It analyses technological developments within tourism, predominantly focusing on the tourist transport sector, which have brought about efficiencies in time and energy use. A conceptual framework for the RE and TRE in tourism is developed and further refined.

## **1.2. Aim and objectives**

### **1.2.1. Aim**

The aim of this study is to investigate the implications of the technology-driven rebound effect in tourism, especially with respect to time, for tourist consumption behaviour in the context of more environmentally sustainable tourism.

### **1.2.2. Objectives**

The study outlines eight objectives in order to achieve the aim and each objective is addressed by different stages of the study (Figure 1.1).

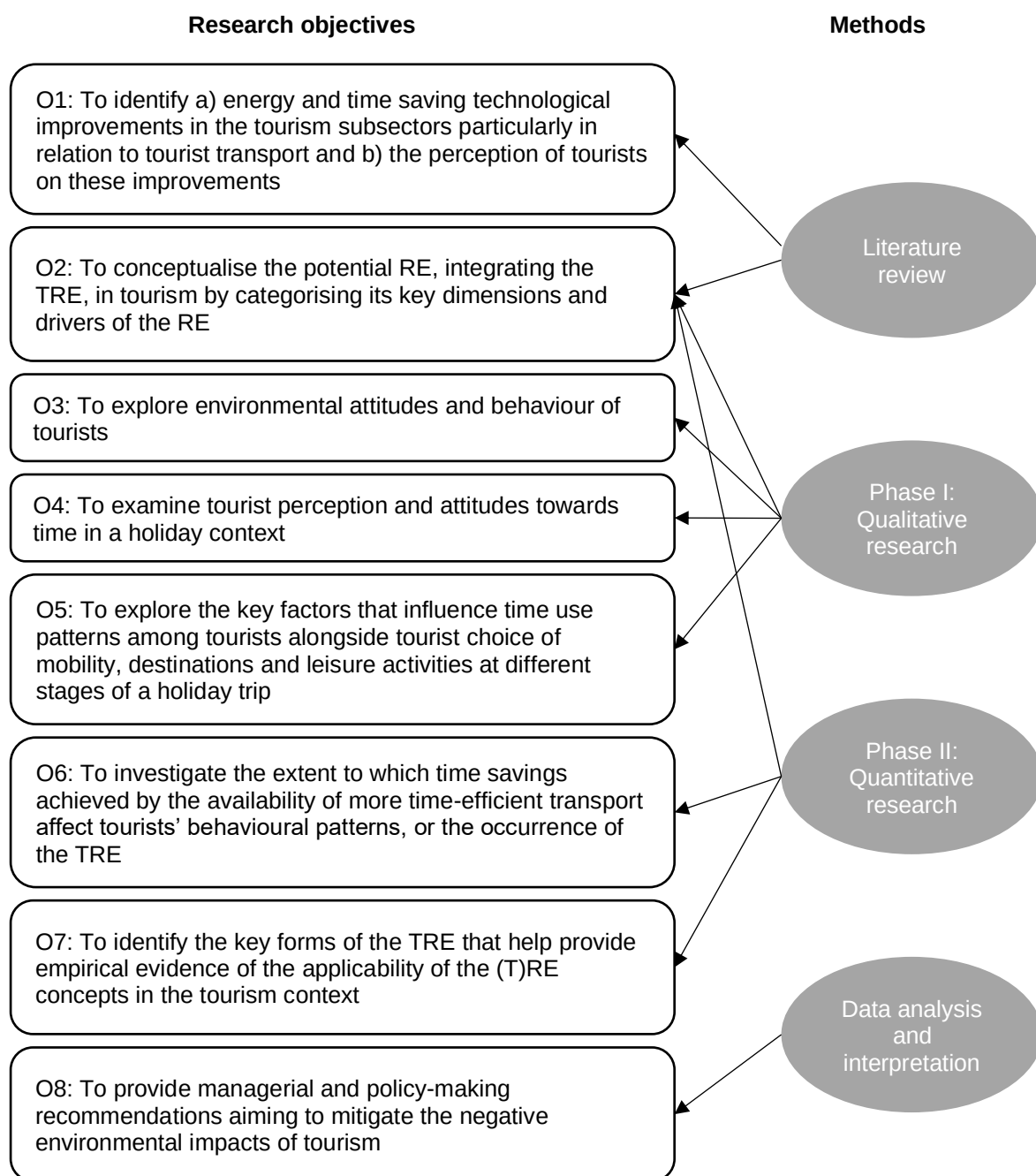


Figure 1.1 Research objectives

### 1.3. Overview of thesis

The thesis comprises six chapters as illustrated in Table 1.1.

Table 1.1 Structure of the thesis

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chapter 1: Introduction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• Unfolds the background and rationale of the study.</li> <li>• Discusses the overall aim and objectives.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                       |
| Chapter 2: The rebound effect, time and tourism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <ul style="list-style-type: none"> <li>• Critically reviews the (T)RE, followed by an analysis of the time and travel concepts in the context of tourism.</li> <li>• Identifies technological improvements associated with the subsectors of tourist transport, accommodation and activities.</li> <li>• Discusses the RE and TRE in tourism studies.</li> <li>• Develops a conceptual framework.</li> <li>• The materials presented in this chapter have been presented in a paper published in the Journal of Sustainable Tourism (Kim et al. 2020).</li> </ul> |
| Chapter 3: Methodological framework                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>• Discusses the rationale for using mixed methods.</li> <li>• Outlines the methodological framework for the exploratory sequential mixed methods research used in this study.</li> <li>• Provides the details of the data collection and analysis processes employed in both phases of the study.</li> </ul>                                                                                                                                                                                                               |
| Chapter 4: Analysis and findings of Phase I – qualitative research                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <ul style="list-style-type: none"> <li>• Discusses the analysis and findings of the in-depth semi-structured interviews.</li> <li>• Presents how these have been used to inform the following quantitative phase research.</li> </ul>                                                                                                                                                                                                                                                                                                                             |
| Chapter 5: Analysis and findings of Phase II – quantitative research                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>• Discusses the results and findings of a series of statistical analysis of the questionnaire survey.</li> <li>• Identifies the key forms of the TREs in terms of destination choices, en-route and on-site.</li> </ul>                                                                                                                                                                                                                                                                                                    |
| Chapter 6: Conclusion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Presents the refined conceptual framework along with a summary of the influential factors on the potential TREs which was developed based on the research findings.</li> <li>• Reviews the main objectives of the study.</li> <li>• Addresses the contribution of the study to both knowledge and practice, respectively.</li> <li>• Underlines the limitations of the study.</li> <li>• Discusses recommendations and suggestions for future research.</li> </ul>                                                       |

## **Chapter 2. Rebound effect and tourism: travel and time**

### **2.1. Introduction**

The literature review of the study consists of four main sections. The chapter begins with a critical overview of the RE and the TRE. Following this, section two analyses the concept of time and travel in the context of tourism. Energy and time saving technological improvements in the tourism industry are outlined. The focus is on tourist transport technologies, but technological improvements associated with the subsectors of tourist accommodation and activities are also discussed. This leads into the discussion of the (T)RE in tourism studies with a review of previous studies. The chapter concludes with the development of a conceptual framework that serves to help better understand tourist behavioural changes facilitated by technological improvements in the tourism subsectors and the implications for environmentally sustainable tourism. A substantial share of the material discussed in this chapter has been presented in a paper published in the Journal of Sustainable Tourism (Kim et al. 2020) (see Appendix 23).

### **2.2. The rebound effect**

#### **2.2.1. The rebound effect (RE): definition and classification**

##### **1) Definition**

The concept of the RE, or the Jevons' paradox, was first proposed in the work of William Stanley Jevons in 1865, from which the RE was derived later on (Alcott 2005). With regard to the consumption of coal, Jevons argues:

“It is wholly a confusion of ideas to support that the economical use of fuel is equivalent to a diminished consumption. The very contrary is the truth” (Jevons 1865, p103).

Jevons' arguments, i.e. increased coal efficiency intensifies coal consumption, were subsequently embraced by energy economists during the 1980s and 1990s (e.g. Khazzoom 1980; Saunders 1992). Since then, the RE has attracted increasing attention among policy makers and academics (Sorrell 2012), triggering further

theoretical exploration that has resulted in a general agreement on the existence of the RE in energy economics.

The RE describes the unexpected economic behaviour response to technological efficiency improvements (Herring and Roy 2007). More specifically, it refers to the extent of energy-saving potential from technological improvements that are offset by increased energy consumption (Sorrell and Dimitropoulos 2008). In this regard, efficiency means the ratio of physical inputs to physical outputs (Herring 2006). This, in energy services, means obtaining the most out of every unit of energy products and services purchased. Technological changes can lower other kinds of input (than physical inputs) such as labour or time per unit of output, compared to organisational or social changes (Alcott 2005). The RE thus is usually based upon engineering calculations concerning technological changes. Despite a range of calculations (equations), these essentially estimate a theoretical amount of energy that could be saved due to energy efficiency improvements, when the demand for goods and services remained constant (Alcott 2005) (see Berkhout et al. 2000 and Sorrell and Dimitropoulos 2008 for rigorous equations of the RE).

More simply, the RE can be expressed as the percentage of expected savings (equal to 100%) (Druckman et al. 2011). When this percentage is greater 100%, then backfire occurs. As a result, the designed efficiency improvements cause an increase in energy consumption, rather than decrease (Jenkins et al. 2011). For example, the expected energy savings by energy-efficient heating in a hotel can be entirely offset by more frequent use of heating. Therefore, unpredictable consumer behaviour lies at the core of the rebound discussion, whereby consumer behaviour changes in unexpected ways that are not forecasted by efficiency improvement models. These basic principles are integral to the RE concept.

## **2) Classification of the RE**

The RE consists of three types: direct, indirect and economy-wide (Greening et al. 2000; Sorrell 2007; Sorrell and Dimitropoulos 2008) (Figure 2.1). The direct RE describes the changes in energy consumption resulting from income and substitution effects on the demand for energy-efficient goods and services such as heating or car travel (Sorrell and Dimitropoulos 2008). The income effect refers to the increase in

consumption of an energy service caused by income gains due to the cheaper energy price (for example, using savings from cheaper fuel costs of running an energy-efficient car for making additional journeys) (Schipper and Grubb 2000). The substitution effect describes the increase in consumption by substituting that service with other services (for instance, substituting a more fuel-efficient car with a coach for a weekend trip) (Binswanger 2001).

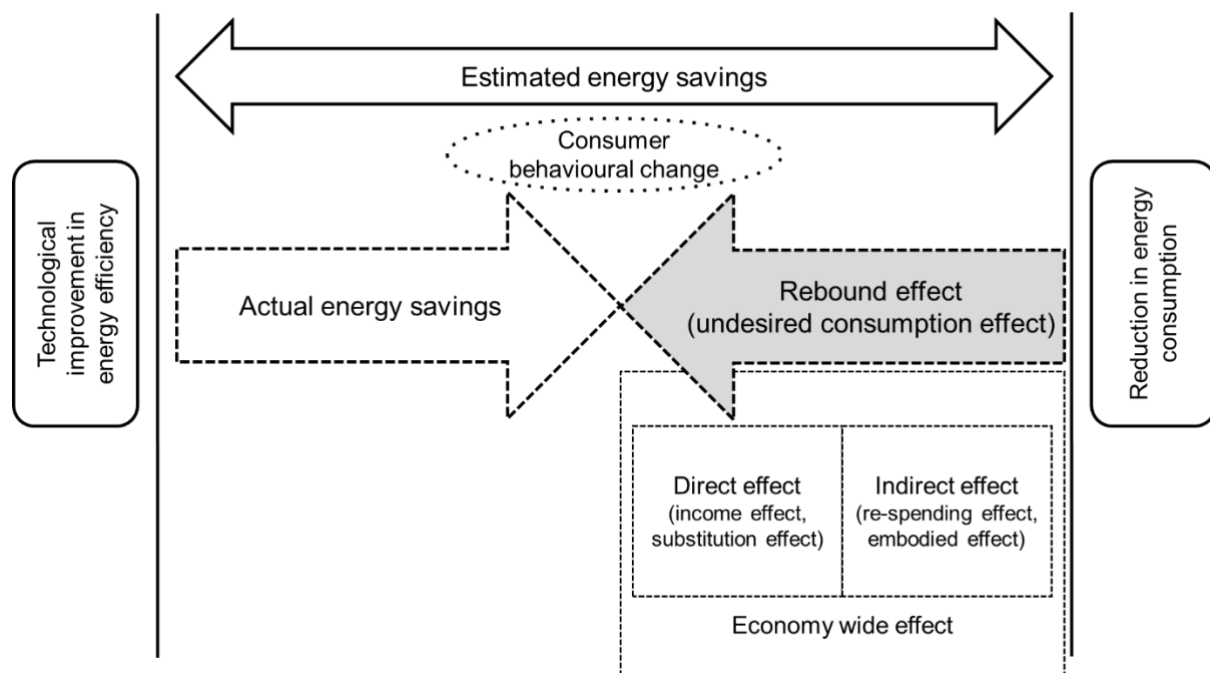


Figure 2.1 Classification of the RE (adapted from Sorrell 2012)

The indirect RE comes from re-spending and embodied effects by driving an increase in demand for other goods and services (Jenkins et al. 2011). The re-spending effect refers to the increase in consumption due to cost savings from energy efficiency improvements achieved for other goods and services which themselves require energy to provide (for example, savings from home heating spent on overseas holidays) (Jenkins et al. 2011). The embodied effect represents the equipment used for energy efficiency improvements, such as thermal insulation, as the equipment itself requires energy to be manufactured (Filimonau et al. 2011). Meanwhile, making economies more efficient stimulates the overall economic output, potentially generating additional demand for energy at both consumer and producer level



(Santarius et al. 2016). Such efficiency-induced effects on economic growth look at the aggregate level that contribute to the total economy-wide rebound due to the changes in energy service costs (the economy wide effect) (Jenkins et al. 2011). For instance, lower steel prices through improving efficiency in production can decrease car prices, increase the demand for cars and thereby increase the demand for travel, i.e. more gasoline, in the long term (Herring and Roy 2007).

While the RE is commonly discussed from the consumer perspective, the perspective of producers in classifying the RE can be very similar, except that the income effect is replaced by an output effect (Sorrell 2012). The cost savings from energy efficiency improvements enable producers to generate more outputs, thereby triggering higher consumption of all inputs that require energy. The producer-side RE has been estimated covering different economic sectors (Saunders 2013) (Table 2.1). Although the producer-side RE can be considerable, in traditional economics consumption is assumed to drive production. This implies that more energy savings can potentially be achieved by directly changing individual behaviour than by influencing producers or using new technologies in the production process (Connolly and Prothero 2003; Gillingham et al. 2016). The reason is that costs of producers are not constrained by a fixed nominal income like those of consumers, thus enlarging the output effects (Stern 2011). Moreover, the producer-side RE is hard to interpret due to many other factors influencing production such as capital and labour (Sorrell and Dimitropoulos 2008). Although the producer-side RE needs to be addressed when understanding the RE in the context of tourism and beyond, the current study focuses on the RE from the consumer perspective.

Table 2.1 Estimates of the producer-side RE

| <b>Author</b>        | <b>Application domain</b> | <b>Region</b> | <b>Type of RE analysed</b> | <b>Estimated RE (% of the calculated savings)</b> |
|----------------------|---------------------------|---------------|----------------------------|---------------------------------------------------|
| Bentzen (2004)       | Manufacturing industries  | USA           | Direct RE                  | 24%                                               |
| Lin and Li (2014)    | Heavy industry            | China         |                            | 74.3%                                             |
| Lin and Tian (2016)  | Light industry            | China         |                            | 37.7%                                             |
| Amjadi et al. (2018) | Heavy industry            | Sweden        |                            | 11-87%                                            |

|                              |                                                                   |         |                    |                                                                |
|------------------------------|-------------------------------------------------------------------|---------|--------------------|----------------------------------------------------------------|
| Wei et al. (2020)            | Energy-intensive industries (manufacturing etc. coal consumption) | China   | Direct RE          | 35.07%                                                         |
| De Borger and Mulalic (2012) | Trucking industry                                                 | Denmark | Direct/Indirect RE | Direct: approx. 0%<br>Indirect:10% (short-run), 17% (long-run) |

### 2.2.2. Empirical studies on the RE

Empirical research has provided evidence of the RE occurring in different economic sectors and geographical regions, predominantly from the perspective of economics (Table 2.2). The direct RE has been measured by using a variety of study methods and via secondary data analysis. The findings show that the magnitude of the direct RE differs by region, despite being likely to be larger in developing nations due to their more elastic demand for energy services (Jenkins et al. 2011). However, it may not be appropriate to apply such generic estimates to certain regions and countries, either developing or developed, as each economy has unique circumstances (Gillingham et al. 2016). For example, energy demand can be driven by unique socio-economic profiles of consumers with attributes such as national culture playing a role (Chitnis et al. 2013).

Table 2.2 RE estimates in academic literature

| Author                       | Application domain<br>H: Household<br>T: Transport | Region  | Research method                                                                                                      | Indicator | Estimated RE<br>(% of the calculated savings) |
|------------------------------|----------------------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------|
| Analysing Direct RE          |                                                    |         |                                                                                                                      |           |                                               |
| Haas and Biermayr (2000)     | H (Heating)                                        | Austria | The price elasticity with time series data (1970-1995)                                                               | Energy    | 20-30%                                        |
| Roy (2000)                   | H (Lighting)                                       | India   | The price elasticity with time series data (1973-1974 to 1989-1990)                                                  | Energy    | 50% (80% for some households)                 |
| Hymel et al. (2010)          | T (Car)                                            | USA     | Elasticity of demand with state panel data (1966-2004)                                                               | Energy    | 9%                                            |
| Wang et al. (2012)           | T (Car)                                            | China   | A linear approximation of the Almost Ideal Demand System (AIDS) model and the price elasticity of energy consumption | Energy    | 96%                                           |
| De Borger et al. (2016)      | T (Car)                                            | Denmark | The elasticity of the demand with Danish register-data (2001-2011)                                                   | Energy    | 7.5-10%                                       |
| Stapleton et al. (2016)      | T (Car)                                            | UK      | Elasticity of the demand with time series data (1970-2011)                                                           | Energy    | 9-36%                                         |
| Moshiri and Aliyev (2017)    | T (Car)                                            | Canada  | The price elasticity of demand with data of the annual national survey of household spending (1997–2009)             | Energy    | 63-96%                                        |
| Belaïd et al. (2018)         | H (Gas)                                            | France  | Linear regression models time series data (1983-2014)                                                                | Energy    | 60-63%                                        |
| Andersson et al. (2019)      | T (Car)                                            | Sweden  | Regression models with national car registry data                                                                    | Energy    | 24%                                           |
| Analysing Direct/Indirect RE |                                                    |         |                                                                                                                      |           |                                               |

|                           |                                                       |                 |                                                                                               |                                                                             |                                                                                                                     |
|---------------------------|-------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Brännlund et al. (2007)   | H (Heating, Electricity)<br>T (Car, Public transport) | Sweden          | Price and expenditure elasticity with household consumption data (1980-1997)                  | GHG intensity (CO <sub>2</sub> , SO <sub>2</sub> , NO <sub>x</sub> )        | 12.9-16.1%                                                                                                          |
| Druckman et al. (2011)    | H (Heating, Food)<br>T (Car)                          | UK              | Input-Output Analysis (IOA) with national time series data (1964-2009)                        | GHG intensity (CO <sub>2</sub> )                                            | 7-51% for reducing food waste, 34% for transport, 12% for housing                                                   |
| Chitnis et al. (2013)     | H (Heating, Lighting)                                 | UK              | Life Cycle Assessment (LCA) and IOA                                                           | GHG intensity (CO <sub>2</sub> )                                            | 5–15%                                                                                                               |
| Murray (2013)             | H (Electricity)<br>T (Car)                            | Australia       | LCA-IOA with four household demand models with household expenditure survey data (2003-2004)  | GHG intensity (CO <sub>2</sub> )                                            | 4.5-7.5% for electricity, 12-24% for vehicle fuel                                                                   |
| Thomas and Azevedo (2013) | H (Electricity)<br>T (Car, Public transport)          | USA             | LCA and environmentally extended IOA (EEIOA) with the U.S. consumer expenditure survey (2004) | Energy/GHG intensity (CO <sub>2</sub> , NO <sub>x</sub> , SO <sub>2</sub> ) | 10% (direct)/5-15% (indirect)                                                                                       |
| Wang et al. (2016)        | H (Electricity)                                       | Beijing (China) | The price elasticity of demand (direct), IOA (indirect) with time series data (1990–2013)     | Energy                                                                      | 24-37% (direct)/46-56%(direct+indirect)                                                                             |
| Analysing Economy-wide RE |                                                       |                 |                                                                                               |                                                                             |                                                                                                                     |
| Turner (2009)             | The national economy                                  | UK              | CGE Model <sup>1</sup>                                                                        | Energy                                                                      | For electricity: 24.75% (short-run), 1.68% (long-run)<br>For non-electricity: 30.37% (short-run), 17.34% (long-run) |

<sup>1</sup> A computable general equilibrium (CGE) model is a computer based large-scale model that simulates the interactions in the whole economy and their sectoral interactions (Babatunde et al. 2017). CGE models use actual data such as national survey on households and firms to capture the structure of the economy or behavioural responses to changes in policy or other factors, for instance, technology.

|                       |                       |        |                                        |        |                                                                      |
|-----------------------|-----------------------|--------|----------------------------------------|--------|----------------------------------------------------------------------|
| Broberg et al. (2015) | Industrial energy use | Sweden | CGE Model                              | Energy | 40-70%                                                               |
| Yan et al. (2019)     | 30 Provinces          | China  | Stochastic frontier model <sup>2</sup> | Energy | Average of all provinces<br>88.55% (short-run),<br>77.50% (long-run) |

---

<sup>2</sup> A stochastic frontier model estimates technical (in)efficiency within a stochastic frontier in terms of production, cost, profit and revenue (Kumbhakar and Lovell 2000).

In comparison, research on the magnitude of the indirect RE or the economy-wide RE is rare because of the complexity of its assessments. The indirect RE is typically estimated alongside the direct RE and, hence, often considered complementary (Freire-González 2017). Unlike the direct RE that only influences direct energy consumption and carbon emissions by consumers, the indirect RE influences both direct and embodied energy consumption and GHG emissions (Chitnis et al. 2013). For instance, the savings from a fuel-efficient car may be spent on more driving (direct rebound and direct GHG emissions), more travelling by air (indirect rebound and direct GHG emissions) or more frequent dining out (indirect rebound and embodied GHG emissions). CGE models have been widely employed to estimate the economy-wide RE by capturing the economic system-wide impact of energy efficiency improvements (see, for example, Turner 2009; Broberg et al. 2015). However, CGE analysis is criticised as having a less developed consumer perspective (Allan et al. 2007), suggesting high probability of excluding the consumption-related RE from calculations.

The majority of studies on the RE have been undertaken in transport and household energy consumption domains. Most studies that estimate the RE in the transport domain (see the Application domain and Indicator in Table 2.2) find increases in energy demand induced by the use of energy-efficient car (direct RE). Studies report different results on the RE depending on the data while most use time-series data. The estimated REs in the studies reviewed (Table 2.2) for private cars range from 7.5% to 96%. Transport related studies have mainly focused on passenger (car or public transport) rather than freight transport (Stapleton et al. 2016). This is because of the greater potential for reducing energy use and the associated GHG emissions in passenger transport, in particular, private cars (Linn 2013; Jägerbrand et al. 2014). Meanwhile, Stapleton et al. (2016) see this as an issue of the availability of data as personal automotive travel and fuel consumption are regularly collected at regional or national levels. Besides, road transport is one of the largest GHG emissions sources worldwide where most of the GHG emissions in road transport come primarily from passenger cars than heavy duty vehicles (Jägerbrand et al. 2014). It is also reflected on the trends observed on road transport and GHG emissions; for example, increasing fuel use and associated emissions by passenger cars compared to relatively stable use of fuel by heavy duty vehicles in the UK (between 1990 and 2017) (Office for National Statistics, ONS, 2019a).

Research on the RE in the household sector includes studies largely focusing on home heating and electricity, with a limited number of other household energy services such as cooling and lighting. The studies featured in Table 2.2 estimate the RE as energy consumption or emissions associated with household goods and services that are induced directly and indirectly. For indirect RE estimates, the re-spending effect of cost savings from using energy-efficient technologies (e.g. in heating or electricity) in other goods and services are often used, and the categories of other goods and services are listed distinctively to individual research, for instance, clothing, food, recreation (Chitnis et al. 2013). Some studies have examined the effect of the adoption of high-efficiency technologies (i.e. the RE), yet without explicitly explaining the concept of the RE. For instance, Davis (2008) finds that gains from using an energy-efficiency washing machine are offset by increased usage, responding to the reduction of the running cost. Although this behavioural response is the classical RE, the concept is not discussed in the study. Much can be learnt from these studies for tourism because tourism's carbon footprint not only comes from increased energy consumption (tourist transport, accommodation and activities), but is also generated by transferring carbon impacts from daily life to tourist trips; for example, spending money saved by using energy-efficient heating in leisure trips – less carbon impacts at home but more in relation to leisure trips (Peng and Guihua 2007).

When it comes to estimating the true magnitude of the RE, some researchers argue that the RE in consumption is only minimal and can be neglected because the share of energy use induced by the RE is too small in the total energy use (Berkhout et al. 2000; Haas and Biermayr 2000; Bentzen 2004). On contrary, others claim that the RE can lead to significant energy demand and thus needs to be taken into consideration due to important economic and environmental implications (Sorrell 2007; Druckman et al. 2011; Matos and Silva 2011; Murray 2013; Wang et al. 2016; Amjadi et al. 2018). However, Greening et al. (2000) and De Borger et al. (2016) assert that there is no general rule to define the size of the RE in consumption, instead it is individually gauged depending on different consumption patterns of each sector and/or country. Due to the methodological difficulties in RE estimation, only a few national or regional energy reduction policies have considered the RE. For example, the UK's Department of Energy & Climate Change, DECC, (2012) highlights the importance of understanding the direct and indirect RE when projecting national energy efficiency

opportunities. Due to lack of empirical data, RE has further been overlooked by international organisations that develop active engagement on energy efficiency policies and programmes at a regional or global level such as UNWTO (2018).

### **2.2.3. The extended concept of the RE**

The underlying assumptions of the RE from energy economics suggest that energy efficiency improvements can lead to behavioural and systemic responses induced mainly by prices and income factors (e.g. saving money). Nevertheless, there has yet been seldom scientific discussion outside energy economics in fields such as tourism (Santarius 2012). An important issue comes to the impacts of energy efficiency and its related REs on the global resource use other than purely energy. Thus, more recent studies have focused on a wider range of the environmental impacts of the RE beyond energy consumption and the related carbon emissions (Throne-Holst et al. 2007). Research is beginning to consider and reinterpret the RE from different disciplinary perspectives, for example, socio-psychology (see, for example, De Haan et al. 2006; Girod and De Haan 2009), which have improved its applicability for sustainability assessments of products and policies (Font Vivanco and Makov 2020). These perspectives strive to understand the assumptions and establish the causes behind the RE in various consumption contexts. From such perspectives, the RE is interpreted rather broadly, addressing diverse environmental aspects instead of energy use alone (Font Vivanco et al. 2014). That is, the RE can incorporate broader efficiency changes (e.g. time efficiency) into the representation of the RE, considering it as a multidimensional concept.

A few studies have estimated the RE induced by resource efficiency policy interventions (Font Vivanco et al. 2018). For instance, focusing on the transport sector, D'Haultfœuille et al. (2014) find the RE in France from a feebate, which is a policy instrument to give a rebate (financial incentives) to consumers who purchase low-emitting vehicles and to impose a fee on purchasers of high-emitting vehicles. The result of the introduction of the feebate policy appeared to be negative in terms of the environmental impacts, i.e. the RE is recognised: higher CO<sub>2</sub> emissions due to increased travel demand following the increased energy efficiency and additional consumer expenditures due to the too generous rebates. From the environmental RE perspective, therefore, environmental goals from policy measures can be achieved by



recognising the policy-induced RE, in a way to adopt different technologies with lower accompanying rebounds (Font Vivanco et al. 2016).

The socio-psychology perspective considers socially and culturally defined costs as drivers of the RE, including environmental values and pro-environmental attitudes of consumers (Otto et al. 2014). Purchasing a hybrid car (which, in principle, is more fuel efficient) reduces the socio-psychological costs of car ownership because the car is accepted by the user's social networks as an environment-benign technology. As the driver feels morally justified, i.e. they drive a less-polluting car, a socio-psychologically justified RE can occur through increasing car use, in which social nature of the effects is observed without defining any economically justified RE (De Haan et al. 2007). Personal norms and preferences may drive the RE. For example, while tourists often report a preference for eco-friendly hotels equipped with technology solutions that enable hotels to save energy and water, they may use more energy and water during their hotel stay or stay in a hotel more frequently and/or for longer (Miao and Wei 2013). The level of consumption can also be determined by satisfying needs and the enhancement of happiness and quality of life (socio-psychological REs), not only by limiting factors such as monetary costs or time (physical REs) (Hofstetter et al. 2006).

In regard to the socio-psychological rebound, the 'spillover' effect is at times referred to in energy efficiency studies as a closely related phenomenon to the RE. Thøgersen (1999) suggests that a change in behaviour may subsequently carry over into other areas, either positively or negatively. Negative spillover effect is of a particular relevance to the RE, which occurs when an individual's motivation for adopting environmentally friendly behaviour in other areas than the original action decreases (Thøgersen and Crompton 2009; Sorrell et al. 2020). In other words, by behaving environmentally friendly or switching to more efficient products and services (e.g. recycling or purchasing an electric car), individuals are less likely to engage in such behaviour in other areas as they feel less obliged to do so (e.g. jet-skiing during a holiday trip). Sorrell et al. (2020) explain this is because people have weak environmental values and thus their pro-environmental behaviour is not spilled over to other areas if there is no more motivation (more like incentives such as financial cost savings) to do so. However, Santarius and Soland (2016) clarify the differences between negative spillover and the RE, arguing that while the former illustrates how

environmentally relevant behaviour transfers from one into other domains, the latter shows how the purchase or use of an energy-efficient technology subsequently changes the use of that technology, compared to the previous consumption patterns of that.

The primary idea of the socio-technological perspective is that technological changes can have a potential for transformational effects in societal changes, associated with consumers' preferences, social institutions and the organisations of production (Greening et al. 2000). Lipsey et al. (2005) highlight the effect of efficiency improvements in general-purpose technologies (e.g. cars, airplanes and computers) as such innovations have resulted in innate changes in social structures and behavioural patterns, also supported by Aall et al. (2011). For example, larger jet engines in commercial aircrafts have stimulated an increase in air travel for leisure and business travel. Greening et al. (2000) argue that the extended concept of the RE including transformational effects is conceptually possible but not analytically applicable. Jenkins et al. (2011) posit that such effects are complex to forecast and quantify due to insufficient data.

### **2.3. The time use rebound effect**

#### **2.3.1. The time use rebound effect (TRE)**

The time dimension has been identified as a driver of the RE in different disciplines, broadening the scope of the academic debate on the RE. As Santarius (2012) claims, efficiency improvement technologies not only lower monetary costs, thus stimulating greater consumption, but also yield other outcomes, such as time savings. Socio-psychological principles indicate that time-saving technologies enable individuals to reinvest time into not-yet-attained personal goals that require resources (Otto et al. 2014). The RE associated with time efficiency improvements is often called the time use rebound effect (TRE). The TRE describes the increased demand for a service associated with the time use because of time savings initiated by time-efficient technologies (Binswanger 2001). Jalas (2002, p118) defines the TRE as the new activities engaged by a consumer because of "a less environmentally harmful product or service being substituted for an existing activity", where activities mean consumption activities requiring energy inputs and time. Jalas (2006) denotes the

notion of TRE as the transformational effect. Regarding this perspective, Greening et al. (2000) point out that

“...many technological advances, in addition to fuel efficiency improvements, have resulted in changes in the allocation of time. This is reflected as a change in labor force participation rates and occupational structure.” (Greening et al. 2000, p.391).

Many technological advances have altered the allocation of time; for example, a washing machine or microwave at home has allowed for more leisure time (Jalas 2009). Developing the theory of time allocation, Becker (1965) argues that the regular growth in technology has improved the productivity of time (i.e. the efficiency of time) that in turn may influence the reallocation of the time towards consumption activities. That is, time-saving technologies inevitably lead to the reinvestment of saved time in order to maximise utility functions (Van den Bergh 2011; Buhl et al. 2017). Classical examples are online shopping (saves time and car fuel to drive to a supermarket) and high-speed rail (saves time and energy to travel by car or a conventional train). Relatively recently, new developments concerning information and communications technologies (ICT) are also interpreted as time-saving technologies as they reduce unnecessary time input (e.g. emails save time and energy to write and deliver paper letters). Many time-saving technologies intensify consumption because they require higher energy consumption to increase the speed of service (e.g. a faster mode of transport) (in production) or stimulate more frequent use of this service (in consumption) (Greening et al. 2000).

Jalas (2004) advocates including the time dimension in discussions of the RE as he argues that consumption is influenced by the temporal dimension embedded in the everyday life of consumers. For instance, people tend to describe travel distance in temporal terms that are not directly linked to physical spatiality (Larsen and Guiver 2013), i.e. ‘it is ten minutes away’ instead of ‘it is one km away’ (BBC 2017). Time-saving technologies therefore generate substitution effects because time is a constraint and/or a necessary input to the use of energy services by consumers, similar to an income increase as defined in energy economics (Becker 1965; Hertwich 2005; Ghosh and Blackhurst 2014). Thus, some time-saving technologies, such as using cars for shopping instead of walking (substitution), may produce a rebound

(Jalas 2002). Sorrell and Dimitropoulos (2008) argue that a relative increase in time costs to energy costs should induce a substitution away from time towards energy-intensive services. With these considerations, when time costs largely govern the total cost of an energy service, consumers are concerned with time efficiency, rather than energy improvements delivered by technology; for example, replacing walking with private car and/or cycling for travelling (Sorrell and Dimitropoulos 2008). Although the implications of the TRE have seldom been researched, its impacts can be substantial (Buhl and Acosta 2016) particularly in relation to the transport sector due to the close link between travel and time, which adds an insight into sustainable tourism consumption as many tourist activities depend on transport.

### 2.3.2. Empirical studies on the TRE

Although time costs and efficient use of time are important, there has been a lack of empirical work on the TRE (Hertwich 2005; Jalas 2009). Nevertheless, in its development, the time rebound concept has been applied in empirical research and some evidence has been produced. Research has largely been conducted in the context of energy consumption in transport and households (Table 2.3).

Table 2.3 Empirical estimates of the TRE

| Author                    | Application domain                            | Region      | Dimension            | TRE                         |
|---------------------------|-----------------------------------------------|-------------|----------------------|-----------------------------|
| Jalas (2002, 2005)        | Home technologies                             | Finland     | Energy               | Measured/<br>Not identified |
| Takahashi et al. (2004)   | ICT (videoconference)                         | Japan       | GHG emissions        | Measured/<br>Identified     |
| Wang and Law (2007)       | ICT                                           | Hong Kong   | Travel behaviour     | Measured/<br>Identified     |
| Spielmann et al. (2008)   | High-speed transport                          | Switzerland | GHG emissions        | Measured/<br>Identified     |
| Brenčič and Young (2009)  | Home technologies                             | Canada      | Energy               | Measured/<br>Identified     |
| Aall et al. (2011)        | Home activities/outdoor recreation activities | Norway      | Energy               | Measured/<br>Not identified |
| Nässén and Larsson (2015) | Reduced working hours of household            | Sweden      | Energy/GHG emissions | Measured/<br>Identified     |
| Buhl and Acosta (2016)    | Reduced working hours of household            | Germany     | Resource             | Measured/<br>Identified     |

|                     |                   |    |        |                             |
|---------------------|-------------------|----|--------|-----------------------------|
| Sekar et al. (2018) | Home technologies | US | Energy | Measured/<br>Not identified |
|---------------------|-------------------|----|--------|-----------------------------|

The TRE originates from transport research, where the concept of the travel time budget was first proposed (Binswagner 2001). The travel time budget describes the time allocated to travel between an origin and destination and varies depending on individuals and factors such as trip purpose, additional activities during the trip as well as the punctuality of arrival (Lo et al. 2006). In the hypothesis of the travel time budget, the potential time savings may partly or completely be offset by a faster mode of transport, by travelling more frequently or covering longer distances. Employing this notion, Spielmann et al. (2008) analyse time allocation by adopting life cycle assessment with the concept of constant travel time budget. In their study, new high-speed metro technologies in Switzerland, as a case study, have been applied in relation to different mobility scenarios (commuting, leisure, shopping and business) of an average Swiss traveller. The study shows that if the travel speed increases, the TRE occurs and triggers additional environmental impacts in all scenarios. When focusing on leisure travellers, if high-speed rail services allow tourists to travel the same distance within less time, tourists may demand more of this service or substitute it with other tourist activities at a destination. Although these substituted activities may or may not be energy intensive (e.g. compare jet skiing with a museum visit), the overall time savings have potential to increase energy consumption in tourism, which yet has not been empirically examined.

Jalas (2002, 2005) analyses daily energy consumption in Finnish households focusing on the temporal activities outside working hours and identifies that the TRE may transfer household activities to other consumption domains (e.g. eating at home to restaurants). Further, Jalas (2005) shows that time use has been a contributor to changes in Finnish households' energy consumption. However, it is found that the lifestyle changes of Finnish households require engagement in less energy-intensive home activities whereas such activities require increasing energy inputs per unit of time. While the notion of the TRE is implied, these studies do not exclusively articulate it and/or discuss its potential effects (Jalas 2006). Moreover, Jalas (2006) recognises the methodological limitations of paring time use and consumption expenditure data in the time use analysis of activities. Nevertheless, his work has provided an important

starting point for an academic debate on time use and energy consumption concerning the TRE in the household context (Rau 2015).

Whether or not time savings increase or decrease carbon footprint depends on the activities that consumers undertake when given additional discretionary time (Knight et al. 2013; Sorrell et al. 2020). Some researchers attempt to capture substitution for activities that can take place outside home, such as holiday travel or tourist accommodation services (Aall et al. 2011; Jalas and Juntunen 2015; Nässén and Larsson 2015) as those activities tend to be more energy intensive than home activities. Yet, most studies exclude these activities, primarily focusing on leisure activities in and around home such as TV watching or attending cultural events (Brenčič and Young 2009; Sekar et al. 2018). To explain the reason, Druckman et al. (2012) underline difficulties in data collection, i.e. the availability of time use data is scarce in general. Aall et al. (2011) highlight that time saved at home (e.g. cooking and cleaning) results in more time available for consumption outside home, thereby increasing energy consumption; however, they do not explicitly consider the TRE or find empirical evidence of its occurrence to support this argument. The analysis of the TRE regarding tourist activities should refine existing research and provide better insights for understanding consumer behaviour influencing energy consumption and GHG emissions in tourism. Further, Druckman et al. (2012) and Nässén and Larsson (2015) claim that the TRE has implications for the generation of GHG emissions, thus calling for a deeper understanding of the linkages between how people use time and consume energy.

The TRE has often been regarded in the context of changes in working patterns of household members. Nässén and Larsson (2015) show that fewer working hours of Swedish households contribute to reduced energy consumption and GHG emissions primarily because of the income effect (lower income means lower expenditure, and thereby lower environmental impacts). However, the study puts little importance on the time effect despite the possibility of its bigger impacts on the environment. A four-day week, for instance, would decrease the time spent on commuting (requiring energy) but a three-day weekend may encourage more energy-intensive activities at/outside home (e.g. longer weekend leisure trips). Buhl and Acosta (2016) reveal that time savings from fewer working hours are reallocated into varied activities such

as voluntary work and care that have positive impacts on the environment, as also noted by Sorrell et al. (2020). They also show that changes in leisure time (non-working time) do not always generate clear environmental benefits because there may be a substitution with resource-intensive activities, such as motorsports. Dickinson and Peeters (2014) call for a more careful analysis of working hour changes with respect to tourist consumption. Changes in working hours may impose various time pressures on tourists and trigger the need for faster modes of transport and may also affect travel frequency.

The concept of household lifestyles has often accounted, albeit implicitly, for the TRE (Peters et al. 2012) with the implications of time for lifestyle choices considered important to better understand future energy use and environmental impacts (Jalas and Juntunen 2015). In fast-paced modern lifestyles, time is considered a scarce resource and, thus, consumption has become time-intensive. As a result, technologies have become more time efficient (e.g. airplanes or dish washers) while the consumption of these technologies has increased (Xu et al. 2014). For example, due to the on-going economic development, China's consumption structure has changed with growing consumption of cars, electronic products and overseas holidays that significantly affect energy use and related GHG emissions (Wang et al. 2016). Specifically focusing on air travel, Ottelin et al. (2014) point out that individual's travel habits are particularly affected by the surrounding structures, or lifestyles, that frame time use and consumption.

In contrast, Sekar et al. (2018) demonstrate that, due to home activity technologies, the US lifestyle has shifted towards spending more time at home than elsewhere, thus engaging in relatively less energy-intensive activities. For example, TV watching is less energy-intensive than outdoor activities which involve travelling. Wiedenhofer et al. (2018) find that living in dense urban areas reduced mobility-related GHG emissions, triggering greater use of faster and relatively cheaper public transport. Hence, a switch in people's time use patterns towards less energy-intensive activities could be a way to curb overall energy consumption (Druckman et al. 2012; Haselsteiner et al. 2015; Buhl et al. 2017), such as through local living, increased community engagement or improved accessibility to nature by public transport. For example, lockdown lifestyle due to the recent global pandemic has helped in reducing

time and energy consumption from commuting to work (Saadat et al. 2020). However, the time saved from the commute may induce the TRE to take more short, regular holidays or breaks (Dominguez 2020) or to work/study from home consuming more residential energy (Filimonau et al. 2021).

Energy-efficient activities and related policies (e.g. promoting use of public transport) as urban planning solutions may affect leisure time and the choice of tourism activities. Czepkiewicz et al. (2018) seek to theoretically explain the causal relationship between urban density and travel and emphasise that lifestyles in dense urban areas can cause more long-distance travel (thereby, higher level of GHG emissions), addressing the notion of the RE. Some studies suggest that the saved time and money from reduced daily travel in urban areas may be compensated by increased long-distance holiday trips at other times (e.g. weekend trips or long-distance holiday trips) (Holden and Norland 2005; Næss 2006; Strandell and Hall 2015), which is referred to as the 'compensatory effect' (Næss 2016). While these studies do not distinguish the terms, i.e. compensatory effect and RE, Czepkiewicz et al. (2018) argue that more distant or frequent travel in leisure time of urban residents induced by the compensatory effect are associated with deficiencies in people's living environment (e.g. limited access to open spaces).

Næss (2016) and Reichert et al. (2016) point out that increased long-distance holiday trips among dense city dwellers can be a blended effect of the RE and a compensatory phenomenon, in which the RE enabled the increased travel (e.g. benefits from short daily trips facilitated by new rapid bus transit system) whereas a compensatory phenomenon explains its motivation (e.g. urban stress that motivates people to make more frequent extended weekend 'escape' trips). However, a weaker influence of compensatory behaviour than the RE on the choice of leisure activities is empirically shown (Næss 2016). Thus, Strandell and Hall (2015) identify that more frequent long-distance holiday trips can be explained by the RE. When this RE occurs, the effects of energy-related activities and policies promoting changing consumption patterns decrease.

Lifestyle can be shaped by socio-cultural factors such as national culture when it comes to energy related behaviour and use of energy and/or time-efficient technologies; for example, using a big car as a social status symbol (Gołembski and



Niezgoda 2012). For instance, people in a rural Indian village tend to use traditional stove over more fuel and time-efficient stoves for preparing bread because they believe the traditional stoves bakes better bread (cultural preference) (Joon et al. 2009). Time savings by using a more efficient stove may have shown a potential for the TRE, without the cultural preference. Therefore, it is important to understand what particular changes in consumers' everyday life imply significant changes in energy consumption in various cultural contexts.

In business travel, Takahashi et al. (2004) identify higher energy demand for new activities facilitated by ICT, such as video conferencing. They demonstrate that the saved time by attending videoconferences instead of going on business trips is used for other activities, such as commuting and holding other videoconferences, thus causing direct and indirect environmental burden. Similarly, Wang and Law (2007) demonstrate that the use of ICT for personal and business purposes saves time, and this time is used for outside home activities such as shopping or leisure trips. Santarius (2016) suggests that the potential for the RE in terms of time as ICT has magnified time efficiency of communication (e.g. significantly reduced time to transfer a message by using mobile devices). Efficient communication technologies accelerate the pace of social life, i.e. towards a fast-paced life (e.g. fast food restaurants, use of social media or short, but more frequent, leisure trips), in turn increasing demand for energy services.

Despite the lack of empirical research to date, the TRE is particularly important in understanding people's travel behaviour, which is also a key aspect to consider in promoting sustainable tourism development. To better understand the effects of the TRE as well as RE in the context of tourism, the role of time in relation to tourist experiences needs to be initially explored.

## **2.4. Time use and tourism**

### **2.4.1. Value of time in tourism**

#### **1) The role of time in tourism**

Research on tourist consumption has underlined the role of time in tourism (see, for example, Pearce 2020). Such research argues that individuals are not primarily

interested in actual travel distance, but rather in the costs of bridging that distance, i.e. time, money and effort (Maat et al. 2005). In an earlier travel time budget study, Johnson (1966, p.138) states that:

“...since trips are a desirable commodity, the number of pleasure trips enters the utility function. (...) However, the amount of time spent on trips appears only in the constraint, it does not appear in the utility function for the same reason that the money spent on trips does not appear there. Time, like money, is nothing more than a desirable ‘currency’ with which commodities can be purchased. To ask about the value of travel time, the value of leisure or, indeed, the value of time is to ask about the individual’s equilibrium marginal rate of substitution between these two ‘currencies’”.

Time is an economic variable (Becker 1965; Chavas et al. 1989); it is a particularly scarce resource, which must be allocated among different activities in less time, including time en-route and on-site (Krakover 2002; Lyons et al. 2007; García 2017). Time en-route indicates travel time which consists of in-vehicle time and out-of-vehicle time (walking and waiting time) whereas time on site means time devoted for attractions and other tourist activities at a destination<sup>3</sup> (Meng et al. 2018). On the one hand, availability of time is a necessary pre-condition to engage in tourist activities (Gołembski and Niezgoda 2012). On the other hand, time is a significant cost in terms of the time length of a journey (Jacobsen et al. 2018). From the latter viewpoint, spending more time on travelling means cutting into the time available for other activities with constrained time budgets, thus limiting activity demand (Maat et al. 2005). As demonstrated in an earlier empirical study on the value of travel time on destination activities (Walsh et al. 1990), tourists are willing to substitute more travel time with time on-site as they then can maximise satisfaction by engaging in on-site activities such as boating. Thus, time is a precious resource that determines tourists’ experiences (Hall 2005). These experiences can be high or low in carbon intensity. As an example, energy consumption of tourist attractions, entertainment and activities in New Zealand have been examined and detailed in Becken (2002). The study demonstrates that tourist activities, particularly motorised (e.g. motor boats) activities,

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<sup>3</sup> In the case of using an aircraft, in-vehicle time would refer to flying time and out-of-vehicle time would refer to additional time required for flying such as check-in time.

require more energy per tourist in general compared to tourist attractions (e.g. museum, zoo) and entertainment (e.g. theatre, casino), considering the operating time as a factor in the analysis of energy consumption of various attractions, entertainment and activities (Becken 2002).

## **2) Time availability (constraints)**

The impact of time availability is of a great importance for tourism. Not only have reduced working hours and flexible working released more time for holidays (King and Van den Bergh 2017), but also technological developments have increased time availability and reduced distance constraints when travelling. Historically, reduced working hours have allowed increased discretionary time for individuals to allocate to different activities such as longer-distance trips (Dickinson and Peeters 2014). In the light of this, Schipper et al. (1989), who clearly relate time-consuming human activities and potential energy use, predict increased energy use in transport because people would have enough time to travel long distances for leisure. Hence, the availability of time has helped individuals become adapted to travelling far and frequently.

A wide range of new technological tools and services have facilitated tourism development and enabled holiday time savings. The utilisation of ICT has allowed tourists to save time in searching for accurate real-time information without any time or geographical constraints (Wang and Law 2007). Technological improvements in tourism have focused on transport because transport technologies (e.g. faster transport modes) are closely associated with travel costs and tourist decision-making (Kelly et al. 2007). Therefore, the provision of time-efficient transport services is a key factor in stimulating demand for tourism, enabling particular travel activities to be performed at lower time costs (Prideaux 2000; Mokhtarian and Chen 2004). Accordingly, tourists often desire to spend time in relation to tourism as efficiently as when working in household time (Bieger et al. 2006; García and Ruiz 2015).

Tourists make choices at many stages of decision-making and consumption in tourism, ranging from where to travel to which activities to engage in at a destination, concerning time constraints (Sirakaya and Woodside 2005). Hall (2005) claims that tourists' potential mobility for travel to/from destination or activity on-site is determined by time (constraints). However, under time constraints, 'rational' decision making and

consumption in terms of environmental sustainability are not always possible in practice (Jackson 2005). For instance, within a destination, tourists tend to pack as much activity, enjoyment and experience as possible into the fixed time without limiting their consumption (Stein 2012; Santarius 2016). Studies that pinpoint the availability of time and the use of it in the context of sustainable tourism with respect to tourist consumption are scarce despite their significance in terms of the potential TRE and negative environmental consequences held (Santarius 2012; Kim et al. 2020).

#### **2.4.2. The perception and the use of time on holiday**

Time in tourism has a subjective character and a social meaning (Dickinson and Peeters 2014). Time is about how people actually experience it and about its relation to social rhythms (Solomon 2016). For instance, there is evidence that people tend to perceive time passing more quickly than the physical clock time when experiences are pleasant such as holiday trips (Levine 1997). The experience of time varies in response to the social context of individuals (Stein 2012). Levine (1997) and Pearce (2020) argue that it is necessary to understand the essential values of a culture in order to account for any temporal patterns or its sense of time. As Golembski and Niezgoda (2012) assert, perception of time and the use of it vary across social groups and societies; therefore, the flow and pace of time are culturally specific, which often plays a significant role in the dynamics of tourist behaviour (Kim and Filimonau 2017) and can be used to categorise tourists (Lewis 2006). In other words, tourists operate with many kinds of time perception to make their own temporal system depending on the contexts. Therefore, the social and cultural perceptions of time are essential to understand tourist consumption patterns.

Alternative perspectives on time and its use when on holiday have led to the evolution of novel types of tourism. For example, slow travel focuses on quality of time over its quantity (Dickinson et al. 2011). Refusing time-efficient fast modes such as cars and airplanes, slow travel is in favour of transport modes that operate at a slower pace and have less environmental impact such as coach, train and bike (Lin 2017). It may be seen as irrational in terms of time costs, but slow travellers would instead apply additional principles to consider the effects of their travel behaviour on the environment or for a particular travel experience based on a chosen transport mode (Dickinson and Lumsdon 2010). The perception of time can also change tourists' perspectives on the

value of their visit as in last chance tourism where the desire to see something vanishing, such as polar bears and Maldives, before they entirely disappear increases with the growing perception that time is running out (Fisher and Stewart 2017). An implication of last chance tourism is that the time constraints may increase tourist demand for the services and facilities that are provided for tourists, such as air travel to a particular destination, which may cause various environmental consequences. Thus, how tourists use their time reflects their perspective on time.

### **2.4.3. Travel context**

While time affects tourist behaviour in absolute terms, temporal behaviour is multifaceted, indicating its interaction between a variety of factors (Hornik and Zakay 1996). The impacts of time are subject to the holiday type (McKercher and Lew 2004). Tourists on a weekend city break may speed up their movement at the destination, ticking off the list of things to do to maximise the utility of their trip within the short period of time given. A relaxing seaside holiday can allow people to be unrushed in terms of attraction visits and activity participation. However, this type of holiday can instead encourage tourists to engage in a variety of exclusive (to such destination) water-based activities such as scuba diving or boat cruising during the stay. Tourists on a guided tour, or package tour, would have different temporal patterns from independent tourists in places such as visit time, itinerary, time spent at sites and attractions. The former is frequently found to utilise time more efficiently than the latter, by ticking the key on-site attractions or activities rather than wandering around (see, for example, Galí and Aulet 2019). Meanwhile, tourists to rural destinations or at campsites would enjoy cycling in a park as pleasantness is more important than saving time (Smith et al. 2019). Subsequently, they will spend their time budgets differently within destinations, ultimately having a perceived positive value on the act of travelling. The purpose of visit is likely to be associated with the length of stay and thus consumption patterns and environmental consequences.

Socio-demographic characteristics of tourists may be associated with their perception and use of time on holiday. A family, particularly with young children, can perceive and use time differently from other tourists such as a couple without children (McKercher 2008; Dargay and Clark 2012; Davison and Ryley 2016). The family must fit the entire trip within the allocated time budget as well as monetary budget and they tend to

organise their time schedule of the trip around children's needs. People on a business trip are found to be very time sensitive (Department for Transport 2015). Such tourists will tend to directly transit to a destination in order to maximise the time spent on-site or to attempt to accelerate a chosen activity (e.g. visiting a national park without leaving a car). In contrast, young backpackers or retired holidaymakers, who purposefully take a longer trip, have much flexibility in their total time cost budgets (Blazey 1992; Collins and Tisdell 2002a; Alén et al. 2017).

## **2.5. Time and sustainable mobility in tourism**

Mobility styles and individual travel behaviour of tourists are closely related to time, providing implications for environmental impacts. Time is highlighted as an important influential factor in tourists' decision making and consumption, particularly with respect to tourist sustainable mobility patterns (Frew and Winter 2009; Hung and Petrick 2012; Dickinson et al. 2013a; Lin 2017). When it comes to sustainable tourism mobility, the mode of transport used (Smith et al. 2019), the distance travelled (Gössling and Peeters 2015) and length of stay (Filimonau et al. 2013) are emphasised as a main source for tourism's GHG emissions, with consideration to temporal aspects.

### **2.5.1. Tourist mobility patterns: mode of transport and travel distance**

It is the availability of time that governs a tourist's travel mode choice, rather than other influential factors, such as monetary costs (Prideaux 2000; Yoo and Chon 2008; Haselsteiner et al. 2015). As a result of insufficient time budgets available for travelling, tourists will ultimately choose a faster mode such as airplane to speed up because time spent on travel to/from destinations can be seen as wasted time (Lyons and Urry 2005). In other words, an increase in speed relaxes the temporal constraint on travel (Dickinson and Peeters 2014). For instance, British tourists can experience spatial and temporal expansion in their leisure trip to Spain by choosing to fly instead of driving.

The accessibility of destinations is influenced by time (i.e. travel speed) as well as their location. In other words, tourists decide on destinations that they are able to access within the constraints of time; for instance, the time required to reach any destination may suggest a particular travel time (Hall 2009a; Litman 2020). Locations convenient for private car travel, such as rural areas where poor public transport services make

travel time longer, tend to be difficult to access by other modes of transport (Dickinson and Robbins 2008). For example, the majority of tourist journeys to the European Alpine region are by car due to a lack of public transport options or information on them (Verbeek et al. 2011). It is not popular with British tourists to travel to Eastern Europe by overland modes of transport due to perceived undeveloped transportation infrastructure within the region, but such modes are often preferred to travel to Southern France due to short(er) travel time and convenient/frequent travel schedules of high-speed rail within France (Filimonau et al. 2014).

Increased speed of mobility by technological breakthroughs has contributed to the increasing average distances travelled by tourists, notably with massive expansion of air transport (Gössling and Peeters 2015). Low air fares and provision of many direct flights as well as the proliferation of low-cost carriers (LCCs) have allowed tourists to reach many distant destinations within time constraints (Knowles 2006). The important fact is that longer travel distances are considerably associated with the use of airplane, which increases the share of tourist transport in the total carbon footprint of tourism (Eijgelaar et al. 2016). Despite technological developments and attempts to improve occupancy rates, average GHG emissions per passenger and kilometre are not decreasing (European Environmental Agency, EEA, 2014). Thus, fundamental change in mobility patterns, i.e. reducing distance travelled, is clearly crucial in tourism with respect to the long-term environmental sustainability (Hall 2015).

### **2.5.2. Length of stay**

Length of stay at a destination has implications for tourism's energy use and GHG emissions (Filimonau et al. 2013). It is further important to understand what activities tourists engage in over their stay at a destination. Becken (2008) argues that tourists tend to allocate time to energy-consuming activities when staying longer at a destination. Divisekera (2010) also finds that the longer tourists stay in a destination, the more they consume in accommodation, food, local transport, shopping and entertainment, but the author rather focuses on economic values (price and income) than attempts to estimate the environmental aspects of such stay. Yet, other researchers contradict this (Scott et al. 2010, 2016; Gössling et al. 2013; Hall et al. 2015). A longer holiday stay could be beneficial in terms of the overall environmental impacts relating to travel transport. This is observed by Sun and Lin (2018), who find

that time savings from the newly built Taiwan's high-speed rail have minimal impacts on the destination's environment. Although tourists save time from travelling by the high-speed rail, they engage in less energy-intensive activities at the destination, rather than changing travel distance or length of stay per trip. UNWTO (2014) and Filimonau et al. (2014) note that the average length of stay per visitor should be increased to enhance the eco-efficiency of travel as the impact of transport to arrive to a destination is distributed over a longer period. In this regard, potential carbon reduction can be achieved by shifts to shorter travel distances with longer stays as well as to less energy intensive modes of transport (Scott et al. 2016). Hunter and Shaw (2007) find that the ecological footprint of longer stay can be determined not only by travel distance but also energy intensity of a host country. For instance, a tourist travelling from a country with high energy consumption (e.g. USA) to one with low energy consumption (e.g. Costa Rica) for a two-week holiday can actually result in reduction in energy consumption and ecological footprint, considering the tourist's energy average consumption for the same period of time at home. Thus, it is suggested that in the estimation of environmental impacts of a holiday, those of a tourist's daily life should be accounted for.

## **2.6. Technological improvements in tourism: energy and time saving technological developments**

Technological improvements have contributed not only to tourism growth but also to the major efficiency gains in energy, time and other resources, thus driving (more) sustainable tourism development (Gössling and Peeters 2007). The application of low impact, or energy-efficient, technologies has helped in minimising the environmental burden of tourism, both at a destination and within the entire tourist journey (Hall and Lew 2009). Besides, it has allowed for significant time and cost savings (Hall and Higham 2005). To identify technology-induced potential savings in tourism, a sub-sectoral approach is often applied, including transport, accommodation and tourist activities (Peeters 2010). A variety of technological developments that have led efficiency in energy and/or time continue to be made, indicating the potential for the RE and also the TRE. These are discussed below.



### **2.6.1. Tourist transport**

#### **1) Air transport**

With continuous technological improvements, larger-capacity, higher-speed and longer-range flights have become a reality, enabling more consumers to travel faster and to reach more distant destinations (Knowles 2006). Fuel efficiency technologies in the aircraft design have helped reduce not only its fuel consumption, often driven by economic factors such as cost savings, but also engine emissions (Peeters et al. 2005). Technology-based CO<sub>2</sub> regulations and standards are in place, which have been integrated in the future aircraft technology development goals (European Union Aviation Safety Agency, EASA, 2020).

Sustainable aviation fuels such as biofuels have continuously been developed to diversify energy sources and tackle the industry's carbon emissions with the first flight using blended biofuels taking off in the late 2000s (Le Feuvre 2019). Aviation is expecting to gradually increase the proportion of biofuels in the total fuel consumption annually (Kousoulidou and Lonza 2016). For the large-scale deployment of biofuels in the long term, several key challenges should be overcome by improving energy efficiency of the overall process of biofuel production, increasing production capacity (i.e. refineries), sourcing sustainable feedstock and thus ensuring cost competitiveness (International Air Transport Association, IATA, 2015 and Le Feuvre 2019).

Some technological advances in aircrafts have greatly reduced journey time. Air travel is particularly preferred by those who place greater importance on travel time, especially for long distant travel (Merkert and Beck 2017). New design for gear and cabin retrofit has saved time for landing/taking off and boarding time (Airbus 2017). Innovative supersonic passenger aircraft are under development which would make a trip from London to New York in a couple of hours, also reducing noise and travel costs (compared to the Concorde) due to improved fuel efficiency (Boyd 2019). While supersonic transport may benefit only selected groups of people at first, continuous development in the aircraft can potentially lead to further cost reduction, providing more tourists with opportunities to travel faster. Jet engine improvements have increased aircraft speeds considerably and thus removed the need to refuel on longer

inter-continental journeys; for instance, a direct flight is available between Australia and the UK without stopping in the Middle East or Singapore to refuel or change planes (Munk 2018).

## **2) Road transport**

Road transport development has dramatically increased the ability to undertake travel to remote destinations, with a rise in car trips per person and in trip length (Gössling et al. 2010). Responding to worldwide concerns on significant energy consumption and GHG emissions from road transport and other associated adverse externalities such as congestion, recent vehicle technologies developed include the use of alternative fuels (Navas-Anguita et al. 2020), rapid transit systems (Poiani and Stead 2015) and autonomous vehicles (Taiebat et al. 2019). The flexibility of motor vehicles enables more flexibility in travel, in terms of distance and time, i.e. without passively squeezing one's time into an official timetabling of mobility such as trains (Urry 2004). In particular, with the expansion of car ownership tourist travel patterns have altered from constrained (e.g. railway lines) to more diffuse and flexible (e.g. same-day excursions by car to many different cities) (Page 2009). In this sense, Merkert and Beck (2017) find that most tourists are less likely to choose to travel by coach because time is often highly valued on holiday and coach takes longer compared with other alternative travel modes such as plane or car.

In terms of travel within destinations, more energy efficient and carbon neutral road-based public transport (e.g. electric bus technologies) are operated for travel within urban areas or in cross-city routes, despite barriers to a broader adaptation such as road condition, climate or ticket cost (Xylia and Silveira 2017). Bus rapid transit systems in many cities globally have greatly enhanced the local travel conditions for both tourists and local commuters, especially in terms of travel time savings (Poiani and Stead 2015).

When it comes to autonomous vehicles, Taiebat et al. (2019) argue that depending on the level of automation, they can reduce driver's time cost per hour (perceived cost for private drivers and actual cost for commercial drivers). According to Fagnant and Kockelman (2015), in-vehicle travel time saved from various aspects such as less congestion, optimised driving cycle and maximised ride-sharing can be used for

drivers to perform other activities en-route and out-of-vehicle time. Other potential time-saving effects of autonomous vehicles are with respect to parking (Wadud et al. 2016). Time spent in traffic or for parking is considered wasted (Russo et al. 2019), but autonomous vehicles would eliminate the wasted time and enable drivers to spend time doing something else instead. For instance, Taiebat et al. (2019) estimate induced increases in travel and energy consumption (i.e. TREs) caused by autonomous vehicles.

### **3) Rail transport**

Improvements in railways have allowed tourists to travel over considerable distances at unprecedented speeds and at a lower unit cost (Hall and Lew 2009). While rail travel is frequently considered more environment-friendly compared to road and air travel, the growing recognition of increasing rail traffic has led to the development of greener rail systems (Pojani and Stead 2015). High-speed rail plays an important role in making travel more sustainable, especially when powered by electricity generated by renewable energy, thus emitting less carbon compared to air travel (Perl and Goetz 2015). The provision of high-speed rail enhances travel time significantly and offers greater flexibility in time use at a destination. High-speed rail can give short-haul travellers advantages due to the time required to reach for/from airports and for pre-boarding procedures at the airport (e.g. check-in and security) (Sun and Lin 2018). New high-speed (High Speed Two, HS2) rail networks in the UK connecting London to the West Midlands and potentially more distant cities have been designed with a prime goal of reducing journey times for business tourism (81 minutes to 52 minutes between London and Birmingham) (BBC 2020b). Besides, the new high-speed rail networks are expected to provide faster connections from and to central London and the major airports for tourists. Furthermore, rail-based rapid transit systems (e.g. light rail and subway), particularly in densely populated emerging megacities such as Beijing and Manila, can reduce travel time but also traffic congestion on roads (Zhang et al. 2018).

### **4) Sea transport**

It has been acknowledged that emissions generated by high-speed ferries with diesel engines are greater than that of road vehicles (Corbett and Farrell 2002). The

significant environmental impacts caused by cruise ships are not unknown. The examples of negative impacts include the vast amount of sewage and solid waste as well as carbon emissions where larger cruise ships would mean more energy consumption and more emissions (e.g. more cabins with air-conditioning) (Tichavska and Tovar 2015). Meanwhile, Tichavska and Tovar (2015) note that the increasing number of passengers and services of sea transport including ferries and cruises has resulted in more frequent services and thus increased the associated emissions share. As an effort to reduce environmental impacts of sea transport, i.e. shipping GHG emissions reduction and air quality improvement, energy-efficient and lower emission technologies in shipbuilding have been adopted in the passenger ship industry, such as heat pumps in cruise ships (Lamers et al. 2015; El-Geneidy et al. 2017). Further, technological solutions to zero-emissions maritime transport are continuously being developed adopting alternative sources to operate vessels, e.g. high-speed ferry powered by hydrogen and electricity using hydrofoils (Department for Transport 2019). Liquefied natural gas (LNG) has increasingly been used instead of marine fuel oils where the first LNG powered passenger ship AIDAnova was introduced as a sustainable cruising in 2018 (Tichavska and Tovar 2015; Iannaccone et al. 2020). LNG is expected to reduce GHG emissions although its contribution to the reductions is estimated to be relatively small (Department for Transport 2019).

As for journey times, high-speed ferries have increased travel speed which may compete with other modes of transport, particularly short-haul aircraft. Nevertheless, it has been established that tourists who are time-sensitive or travel for longer distances when visiting the Greek islands would not substitute airplane with high-speed boat although the alternate mode (high-speed boat) are offered at lower costs and at fast speed (however, yet slower compared to airplane) (Rigas 2009). Instead, many sea transports are accounting for a main part of facilitating water-based tourist activities such as sailing by yacht (Page 2009).

## **5) Technologies in terminals**

Breakthroughs in technology help in cutting down the time spending on queues at airports (Bearne 2016); for instance, robots help passengers in the airport to navigate directions. As addressed by Lien et al. (2019), faster air travel services such as online check-in and smart-phone based boarding passes at departures and automatic

passenger control using biometrics (e.g. facial recognition) installed at arrivals have enhanced experiences of travellers. The optimised timetabling for trains and coaches is expected to shorten passengers' travel time by dropping waiting times in stations as well as by reducing the total journey time (Scheepmaker et al. 2017). The optimised timetabling in urban rail networks has shown to save travel time to a certain level when train capacity is considered (Zhang et al. 2018).

These technology-based services allow travellers to reallocate their saved time to somewhere else. When there is a substantial amount of time saved from such services during a holiday, tourists can make significant changes in their behavioural patterns by reinvesting the time savings into the holiday-related (e.g. extra leisure activities on site) or other (e.g. preparing/shopping for the holiday) activities (Sun and Lin 2018). While the benefits and importance of time savings are highlighted (Lien et al. 2019), where to reallocate the time saved or the potential environmental impacts (i.e. the TRE) have not yet been explored in tourism.

### **2.6.2. Tourist accommodation and activities**

Substantial energy consumption by different services and activities in tourist accommodation is a main driver of GHG emissions, which may differ in magnitude by types and sizes (e.g. hotels tend to be more energy intensive than campsites) (Becken 2013). Similar to residential buildings, the application of technologies in tourist accommodation buildings has improved energy efficiency, for example, geothermal space heating/cooling or energy-efficiency lighting throughout (Graci and Dodds 2008) and smart energy meters installed in rooms for energy management (Filimonau and Magklarpoulou 2020). Some new technologies such as mobile room keys have reduced time-consuming tasks for hotel guests, thus enhancing accommodation experience (see Singapore Hotel Association 2019 for examples of smart hotel experiences). Moreover, in-room entertainment technologies, such as Amazon Echo, an Internet-connected voice interface that plays audio-books and TV and also provides travel information using simple voice commands, have changed in-room behavior with respect to time use and experience of hotel guests (Biesiada 2017). These technologies are found to directly correlate to the amount of time guests spend in their room (Bilgihan et al. 2016).

A large proportion of typical tourist activities tend to rely on the natural resources at a destination, indicating environmental impacts (Scott et al. 2016). Activities that require the use of motorised transport (e.g. jet skiing) are particularly energy-intensive compared to others (e.g. visiting museums) (Smetschka et al. 2019). It is therefore noted that transport technologies have influenced the tourist activity patterns in two ways: first, by enabling tourists to have more time to engage in activities on-site through time savings provided by faster modes of transport en-route, and second, by providing them with a broader range of activities facilitated by transport (e.g. heritage railways and scenic helicopter rides) (Page 2009). Very limited research has however attempted to understand how tourists use time when partaking in tourist activities and evaluate its implications for tourism's environmental sustainability.

## **2.7. The RE and TRE in tourism**

### **2.7.1. The RE and TRE in tourism studies**

The importance of energy-efficient technologies, particularly in tourist transport, has often been a focus of tourism studies as such technologies have not only aided in the GHG emissions mitigation, but also led to a substantial increase in the capacity, comfort and speed of travel (e.g. high-speed rail) (Nižić and Bračić 2014). However, energy efficiency interventions appear insufficient to accommodate projected future growth of tourism, particularly changes in transport (Ram et al. 2013). Peeters et al. (2016) argue that new technologies to mitigate tourism's GHG emissions justify continued inaction when considering changes in tourist consumption beyond efficiency improvements and shift the environmental burden to future generations. Technological optimism favours the ability of technological solutions to make the world more sustainable and assumes rational behaviour of individuals, at times underestimating the potential for future, unaccounted for in sustainability assessments demand for energy services that can be substantial (Arvesen et al. 2011). Lenzen et al. (2018) argue that tourism-related technologies are unlikely to curb tourism's GHG emissions alone because of the rapidly increasing tourism demand.

According to Gössling et al. (2013), the increase in tourism's GHG emissions is driven by the growth in travel frequency and travel distance, which is also noted by Aall et al. (2016). Tourists in China, for instance, have made a major shift towards faster modes

of transport: from train to car and/or airplane, despite the potential for increasing tourist demand for domestic rail travel due to China's new high-speed rail which is being built (Wang et al. 2018). Hence, the notion of the RE in the context of tourism and travel is essential.

Although some types of the RE from the traditional rebound studies are relevant to tourism services and tourist behaviour, little research has been conducted on the implications of the RE for tourism or to conceptualise the RE of tourist consumption (Gössling et al. 2013). However, UNWTO (2014) observes that increased demand for air travel and tourism can potentially be driven by increased energy efficiency gains, implying the existence of the RE. Although there is no dedicated research agenda on the RE in the tourism literature, a few studies have either directly or indirectly highlighted the impact of the RE and/or the TRE in the context of tourism (Table 2.4). The studies in Table 2.4 have assumed the effect of the potential (T)RE but not empirically examined this effect. While Gössling et al. (2013) emphasise that the relevant RE at different scales needs to be considered in GHG emissions projections and mitigation scenarios for the tourism industry, Hall (2013, 2015) stresses that the RE will occur in tourism unless resource use globally is limited by caps that introduce absolute upper limits of consumption. In the case of the latter, regarding sustainability and the 'green' growth, it is important to address not only efficiency, i.e. the value of technological changes, but also sufficiency, i.e. that behavioural changes of tourists are key to the contribution of tourism to environmental impacts (Hall 2009b, 2015; Hall et al. 2015).

Table 2.4 Anticipated RE and TRE in tourism

| <b>Author</b>          | <b>Anticipated drivers</b> | <b>Anticipated RE</b>       | <b>Rebound representation in tourism</b>                              |
|------------------------|----------------------------|-----------------------------|-----------------------------------------------------------------------|
| Prideaux (2000)        | Cost saving<br>Time saving | Price effect<br>Time effect | Transport<br>Accommodation<br>(higher standard)<br>Tourist activities |
| Becken (2005)          | Time saving                | Time effect                 | Transport                                                             |
| Gössling et al. (2010) | Cost saving<br>Time saving | Price effect<br>Time effect | Transport<br>Accommodation<br>Tourist activities                      |
| Peeters (2010)         | Cost saving<br>Time saving | Price effect<br>Time effect | Transport                                                             |

|                                       |                                |                            |                                |
|---------------------------------------|--------------------------------|----------------------------|--------------------------------|
| Gössling et al. (2013)                | Cost saving                    | Price effect               | Transport<br>Accommodation     |
| Hall (2013, 2015), Hall et al. (2015) | Cost saving                    | Price effect               | Transport                      |
| Dickinson and Peeters (2014)          | Time saving                    | Time effect                | Transport                      |
| UNWTO (2014)                          | Cost saving                    | Price effect               | Transport                      |
| Nisa et al. (2017)                    | Not specified                  | Not specified              | Accommodation                  |
| Palgan et al. (2017)                  | Cost saving                    | Price effect               | Accommodation                  |
| Filimonau et al. (2018)               | Soci-psychological cost saving | Socio-psychological effect | Transport                      |
| Gössling and Hall (2019)              | Cost saving                    | Price effect               | Sharing services (e.g. Airbnb) |

Table 2.4 suggests that the RE in tourism research has been considered from two main perspectives, time and cost, with the latter being dominant, and largely within the tourist transport context. Peeters (2010) uses a causal loop diagram, which visualises interrelated different variables, to explore the achievement of technological improvements (both positive and negative) in tourism transport and demonstrate the existence of the RE. However, research fails to identify the causes and consequences of increased travel and consumption or the implications for pro-environmental consumer behaviour in tourism. Nevertheless, it is important to explore how recent time-saving technologies in tourist transport affect activity patterns of tourists en route and on site in terms of energy use and related environmental impacts, providing the explanations for the TRE and its implications.

Traditional rebound studies from energy economics have implications for the tourist accommodation sector. While the use of residential energy-efficient technologies (e.g. home heating) can serve the purpose of efficiency gains in tourist accommodation buildings, individuals may adjust their behaviour, often leading to higher demand (Nisa et al. 2017). While individual behaviour in energy consumption during holiday largely replicates the consumption lifestyle at home, consumers are less likely to conserve energy on travel as they are not directly paying for their consumption (Barker et al. 2013) and this may reduce the effectiveness of hotels' sustainability policies (Budeanu 2007; Filimonau and Magklarpoulou 2020). Moreover, with time-saving technologies



in hotels, tourists are no longer kept waiting in lines but instead use the saved time for other activities, which possibly result in additional environmental burden at destinations (the TRE). Complimentary in-room entertainment technologies are found to directly correlate with the amount of time guests spend in their room, making guests' hotel stays more enjoyable, while triggering higher energy use (Bilgihan et al. 2016). Thus, for some tourists, a stay in luxurious hotels equipped with hi-tech technologies and energy-intensive facilities (e.g. pools), is preferred (Scott et al. 2010). The cost savings from staying in ICT-enabled shared accommodations such as AirBnB can stimulate consumption that has adverse environmental impacts (Gössling and Hall 2019). With the development of ICT, when the RE or the TRE occur, corresponding increased consumption of tourist accommodation and tourist activities is expected (Nisa et al. 2017).

Tourist activities can largely reflect time cost savings en-route from transport technologies, increasing travel frequency and the length of stay at a destination, with the implications for the TRE (Dickinson and Peeters 2014). Frequent travel implies the environmental impacts from more travel (transport) and increased consumption of accommodation and other activities at a destination. Despite arguments that longer stays are more eco-efficient (Scott et al. 2010, 2016), if length of stay is influenced by en-route travel time, the patterns of tourist activities and related energy consumption and GHG emissions may differ, which implies the TRE. When more time is given, tourists may invest this extra time in energy-intensive activities at a destination (Becken 2008), but this has never been consistently explored in tourism studies. Relating to tourist activities, Aall (2014) and Aall et al. (2016) indicate that although artificial ski slopes are a frequently suggested strategy for a reduction in snow reliability, there appear new climate change vulnerabilities. That is, greater volume of fresh water and energy is required to generate artificial snow, implying the producer-side RE. Hall et al. (2016) emphasise the need to pay attention to changes in actual consumption of tourists as well as the adoption of (energy and time) efficient technologies.

### **2.7.2. Conceptual framework of the potential RE and TRE in tourism**

#### **1) Conceptual framework**

It is critical to identify the underlying assumptions behind the RE that link efficiency changes in time, energy and resource use derived from technological solutions with increasing demand in the context of sustainable tourism development. This highlights the need for a framework that can be used to have a comprehensive understanding of the (T)RE occurrence, which is to encapsulate the relevant variables and map out the relationships between variables. The framework therefore assists in identifying and evaluating any potential RE, including the TRE, and the impacts on consumer behaviour in tourism. Reflecting upon the needs and applicability of the RE in tourism studies, a conceptual framework is developed as Figure 2.2 which incorporates the key elements identified by reviewing the literature.

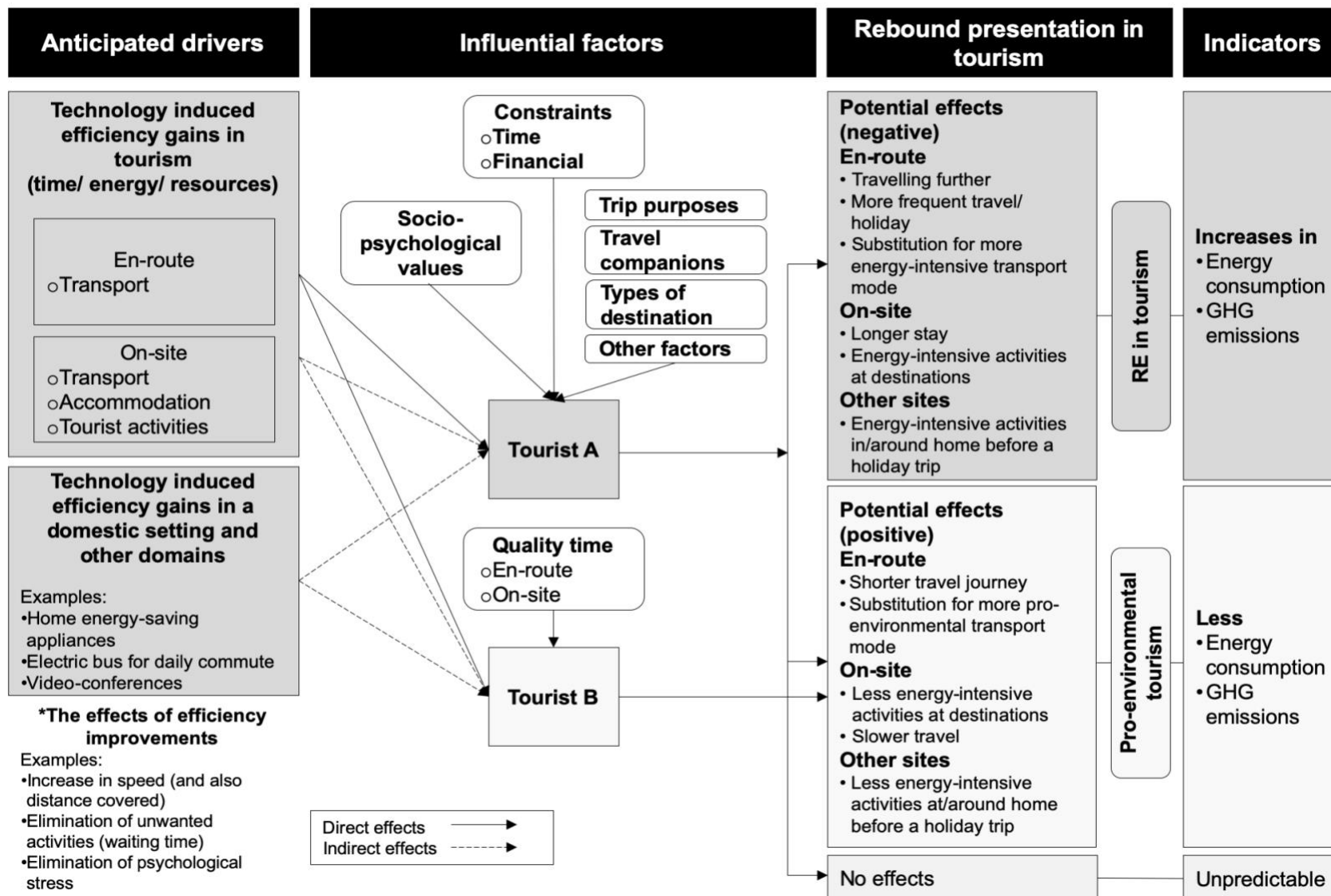


Figure 2.2 Conceptual framework of the potential RE in tourism

In the context of tourism, the RE implies greater consumption in its three sub-sectors, i.e. tourist transport, accommodation and activities, relating to efficiency gains both en-route and on-site. It is important to recognise that discretionary time (as well as money) from efficiency gains in a domestic setting and/or other sectors can be spent on increased travel and tourism activities (Anticipated drivers in Figure 2.2). These efficiency gains directly or indirectly affect tourist behaviour throughout a holiday journey through inter-related effects including time, money (income/price), socio-psychological effects and other factors (Influential factors in Figure 2.2). Particularly, time and financial constraints can be of major influence for a tourist to engage in any tourist activities when efficiency changes from technological improvements occur, as discussed in rebound studies to date (for example, Chitnis et al. 2013; Jalas and Juntunen 2015; Buhl and Acosta 2016). The inter-related saving effects including time, income/price and socio-psychological effects are initiated by the specific nature of efficiency changes (e.g. time efficiency) from technological developments.

Driven by these effects, tourists may show a potential behavioural shift to energy-intensive activities when travelling, but also when using in-room services and undertaking activities at destinations. For instance, when the time effect plays a key role in determining behavioural changes in tourist consumption, it can be defined as the TRE, represented by the case of Tourist A in Figure 2.2. Then the potential TRE is observed including: travelling to further afield, taking more frequent holiday trips, staying longer at destination, engaging more in energy-intensive activities at destinations and/or substituting a mode of transport (e.g. train) with more energy-intensive transport modes (e.g. airplane). These effects are likely to generate higher energy consumption and GHG emissions (negative impacts). In the opposite case, efficiency gains have potential to reduce energy consumption and GHG emissions by engaging tourists in more environmentally-friendly modes of transport en-route and less energy-intensive activities during their stay (positive impacts). Lifestyles, changes in working hours or cultural impacts on time perception and consumption may act as drivers of the TRE. Meanwhile, tourists who pursue alternative tourism experiences should not be neglected such as those who seek quality time en-route as well as on-site and are concerned with their environmental impacts (such as the case of Tourist B in Figure 2.2). Regardless of efficiency gains relating to time, these tourists may

show a meaningful contribution to mitigate tourism's carbon footprint by engaging in slower movements en-route/on-site.

## **2) Scenarios**

The proposed conceptual framework can support the development of a series of scenarios and outline potential response options of tourists. For example, a holiday trip of a tourist with limited time budget would be governed by the time effect (see Influential factors in Figure 2.3) and, thus, the tourist would choose a faster mode of transport, e.g. choose to travel by air over train (Anticipated drivers in Figure 2.3), if available, so as to arrive at the destination faster in order to have a better holiday experience. In this case, the tourist has more time to spend at the destination (Time effect in Figure 2.3), so they may go for an additional scenic river cruise using time saved from air travel (Potential effect 1 in Figure 2.3). As shown by Eijgelaar et al. (2010), scenic cruise ships generate disproportionately high amounts of GHG emissions (Indicators in Figure 2.3), where the RE is demonstrated. However, other important factors such as financial constraints should also be recognised in estimating the (T)RE in tourism.

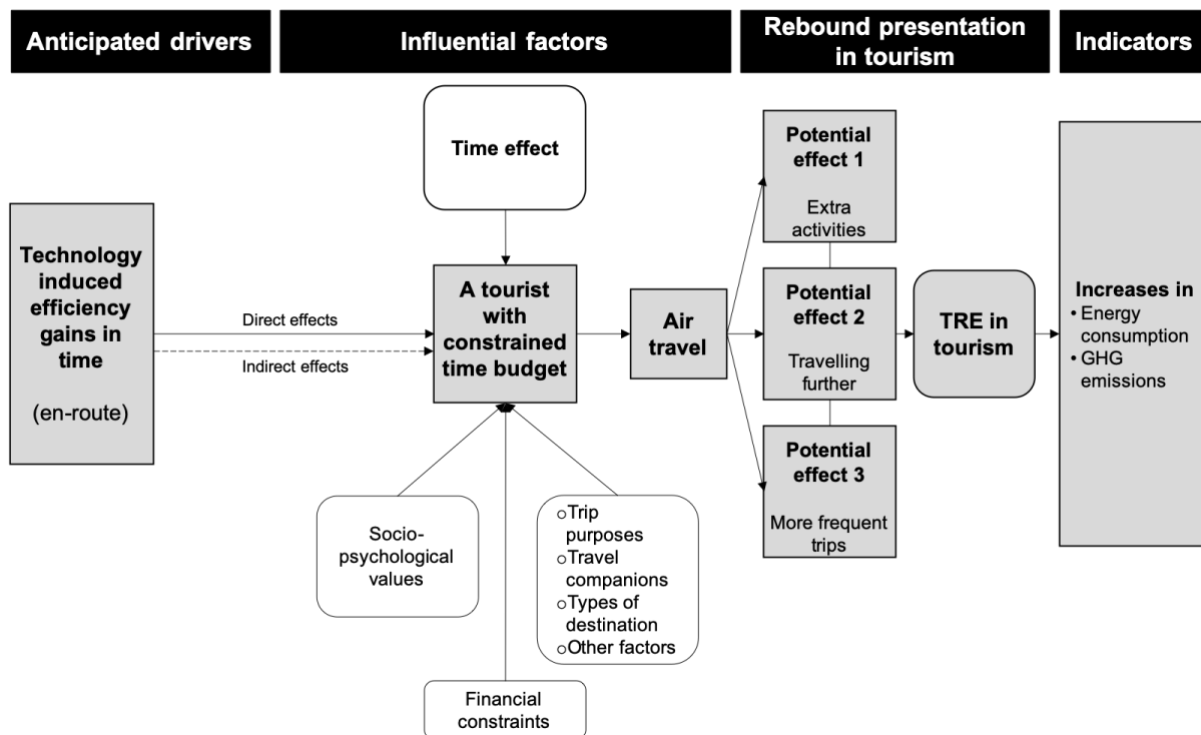


Figure 2.3 Tourism (T)RE scenarios and the environmental impacts

Meanwhile, the same tourist may decide to travel to a more distant destination (Potential effect 2 in Figure 2.3) instead of a closer destination as airplanes have enabled them to travel longer distances within the same or even less time. This tourist can also decide to take more frequent trips (Potential effect 3 in Figure 2.3). In these cases, the RE generates undesired environmental impacts from air travel (Indicators in Figure 2.3). In these two scenarios, technological developments that enhance time efficiency are unlikely to bring about environmentally-friendly effects due to the RE, more specifically the TRE.

## 2.8. Summary

The concept of the RE has widely been applied in energy economics to evaluate the effects of energy efficiency improvement particularly in the transport and household energy contexts. The rebound debates have shifted their focus, proposing its applicability in other fields, such as social psychology. Considering time is a key aspect in consumption, the RE has been estimated with respect to time. While this TRE has implications for the tourism industry, there has been little attention paid to it. Time plays

a significant role in tourism particularly as a cost (time constraints), but it also enables tourists to make different choices in relation to their en-route and on-site behaviour. How tourists perceive time varies as time is contextual, which is important to understand because it is connected to how they use time on a trip. Time use patterns of tourists are closely linked to their consumption, and further environmental impacts. In this sense, it is necessary to understand tourists' perception and use of time in tourism and examine the implications for the environment. Thus, this study adopts the concept of the (T)RE to explore the impacts of time on tourist consumption behaviour and associated environmental impacts.

## **Chapter 3. Methodological framework**

### **3.1. Introduction**

This chapter begins with a review of the research aim and objectives, followed by in-depth discussion of research strategy, i.e. the research approach employed in this study, abduction. The chapter continues to discuss the rationale for using mixed methods in this study. The methodological framework is then outlined to provide a discussion of the two phases of data collection and analysis, where Phase I relates to the qualitative research that informs and helps develop the design of Phase II, quantitative research, i.e. an exploratory sequential design (Creswell and Plano Clark 2011). The chapter then provides the details of the employed methodological tools, sampling techniques, data collection and analysis process. Limitations, ethical considerations and health and safety issues are discussed. The chapter concludes with a section that summarises the methodological framework of the study.

### **3.2. Review of research aim and objectives**

#### *Research aim*

The aim of this study is to investigate the implications of the technology-driven RE in tourism, especially with respect to time, for tourist consumption behaviour in the context of more environmentally sustainable tourism.

#### *Research objectives*

The study addresses eight specific objectives in order to achieve the aim (Figure 3.1).



### Research objectives

O1: To identify a) energy and time saving technological improvements in the tourism subsectors particularly in relation to tourist transport and b) the perception of tourists on these improvements

O2: To conceptualise the potential RE, integrating the TRE, in tourism by categorising its key dimensions and drivers of the RE

O3: To explore environmental attitudes and behaviour of tourists

O4: To examine tourist perception and attitudes towards time in a holiday context

O5: To explore the key factors that influence time use patterns among tourists alongside tourist choice of mobility, destinations and leisure activities at different stages of a holiday trip

O6: To investigate the extent to which time savings achieved by the availability of more time-efficient transport affect tourists' behavioural patterns, or the occurrence of the TRE

O7: To identify the key forms of the TRE that help provide empirical evidence of the applicability of the (T)RE concepts in the tourism context

O8: To provide managerial and policy-making recommendations aiming to mitigate the negative environmental impacts of tourism

Figure 3.1 Research objectives

### 3.3. Research paradigm and research approach

#### 3.3.1. Research paradigm

Every decision made in the research process, including research design and the choice of method, is shaped by the basic philosophical assumptions of a researcher. Underlying philosophical assumptions can be explored by understanding the prevailing research paradigms that potentially inform approaches to methodology in research (Mertens 2015). Kuhn has coined the term paradigm, describing it as the collection of underlying beliefs and values shared by a research community upon

which the rules for research is based (Kuhn 1996). Since Kuhn's original work in 1962, the concept of paradigm has been applied in social science; the importance of the belief and value systems of researchers to research methodologies and principles has been recognised (Cohen et al. 2018). In this sense, Saunders et al. (2009) state that research paradigm is "a way of examining social phenomena from which particular understandings of these phenomena can be gained and explanations attempted" (Saunders et al. 2009, p.118). Guba and Lincoln (1994) discuss how the research paradigm relates to types of methods (qualitative or quantitative):

"Questions of method are secondary to questions of paradigm, which we define as the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways." (Guba and Lincoln 1994, p.105)

That is, research methods are essential to be built upon a solid basis of understanding the philosophical underpinnings. Research paradigm can be characterised as responding to, but not limited to, three basic questions, including: ontological, epistemological and methodological questions, which are interrelated (Guba 1990). Guba and Lincoln (1994) claim that the answer given to any one question constrains how the others may be answered. Ontological assumptions are concerned with what constitutes reality. In social research, two basic positions recognise the fundamental nature of reality: realist and nominalist (Cohen et al. 2018). Realists perceive the existence of reality as external (being out there) and independent of social actors and their interpretations of it, labelled also the objectivist view. On the other hand, the nominalist, or subjectivist, position views that reality is dependent on social actors, concerning with their existence (Neuman 2013). Ontological issues tend to emerge together with epistemological issues (Crotty 1998).

Epistemological assumptions are concerned with how researchers acquire, formulate and justify their knowledge claims (Scotland 2012). That is, questions are about how one knows what they know. An epistemological stance holds that knowledge is objective and tangible and, therefore, an understanding and values must be objectified in study subjects (Mertens 2015). Thus, producing knowledge and learning about reality are facilitated by careful observations of them, by verifying ones' ideas with consistent evidence. Another epistemological position rejects this view of human

knowledge because interpretations and subjective views largely affect all observations, looking at the real world through a lens of inner subjectivity. The best knowledge is constructed from the outcome of a constant process of actions and interpretations occurring in specific settings (Neuman 2013). The former refers to postpositivism, the latter is termed constructivism (Mertens and Wilson 2012).

The epistemological concerns, the very bases of knowledge, profoundly affect how the researcher goes about finding knowledge and carrying out research; that is, methodology. Researchers' ontological and epistemological stances influence the methods they regard as legitimate in conducting empirical research and determine what they consider as a valid theoretical contribution (Tsang 2017).

### **3.3.2. Pragmatism**

The argument by both sets of quantitative and qualitative purists (i.e. constructivist and postpositivist) that the two methods cannot be combined, or are incompatible, due to fundamental paradigmatic differences between the two, (see Howe's (1988) discourse on the *incompatibility thesis*), has been rejected by pragmatists who adopt an alternative paradigm, or pragmatism (Morgan 2007). Pragmatists argue that the nature of truth and reality cannot be accessed solely through the use of a single scientific method (as in postpositivism), but that it rather arises out of action, situations and consequences (Mertens and Wilson 2012). For instance, John Dewey, one of earlier pragmatists, has promoted pragmatism by emphasising on human experience, describing reality by denying approaches from postpositivism and constructivism:

“In brief formula, "reality" becomes what we wish existence to be, after we have analysed its defects and decided upon what would remove them; "reality" is what existence would be if our reasonably justified preferences were so completely established in nature as to exhaust and define its entire being and thereby render search and struggle unnecessary.” (Dewey 1925, p54)

Thus, pragmatists are rather concerned with applications: for example, Howe (1988) suggests that truth is ‘what works’ which researchers should forge ahead with, and with solutions to problems (Creswell and Creswell 2018). Besides, the primary focus of pragmatism is on the consequences of research using a variety of approaches and valuing both objective and subjective knowledge (Creswell and Plano Clark 2011).

This paradigm perceives that research on any inquiry falls anywhere within a research cycle at any point of time: for example, one research approach starts from theories while others start from observations and facts (i.e. logic or research approach) (Teddlie and Tashakkori 2009). That is, pragmatism allows for a more flexible approach to the relationship between theory and data. In this regard, Teddlie and Tashakkori (2009) address the distinctiveness of pragmatism from other paradigms that researchers are no longer disrupted by the forced-choice dichotomy between postpositivism and constructivism with respect to ontology, epistemology, logic (or approach) and methods.

### **3.3.3. Research approach**

Paradigmatic approaches influence how researchers view logics of any research inquiry that includes deductive, inductive and abductive approaches (Johnson and Onwuegbuzie 2004). A deductive approach is closely associated with postpositivism and quantitative research, where its reasoning begins with a rule (or rules) and seeks generalisability through value-neutral and controlled processes (Saunders et al. 2009). With this approach researchers develop a hypothesis (or hypotheses) derived from existing theories, which they subsequently test using data in order to deduce the hypothesis (Bryman 2015). However, a deductive approach cannot be used to develop new perspective and concepts that may challenge existing ideas (O'Reilly 2009). It is also questioned about this approach that the truth of conclusions significantly relies on the truth of the premise on which it is based (Antwi and Hamza 2015).

An inductive approach, however, involves the opposite direction from deduction, which is closely related to constructivism and qualitative research (Saunders et al. 2009). In inductive research, the goal of researchers is to explore data and inductively develop theoretical concepts and patterns from observed data, where the researcher makes interpretations of the meaning of the data (Creswell and Creswell 2018). Yet, an inductive approach is claimed to have a key issue with reliability in terms of generalisation of a conclusion (Walliman 2011).

An abductive approach has a distinctive logical form from deductive and inductive approaches, which is primarily used in mixed methods research. Charles Peirce, who identified and developed the term abduction, describes abduction as “the only logical

operation which introduces any new ideas; for induction does nothing but determine a value, and deduction merely involves the necessary consequences of a pure hypothesis” (Burks quoting Peirce 1946, p.303). In fact, Peirce’s abduction is more likely to be an integral approach to research inquiry. Hence, for Peirce, research should apply all abductive, deductive and inductive approaches together in order to cover research inquiry comprehensively (Yu 1994). Likewise, Yu (1994) concludes these three logics:

“At the stage of abduction, the goal is to explore the data, find out a pattern, and suggest a plausible hypothesis with the use of proper categories; deduction is to build a logical and testable hypothesis based upon other plausible premises; and induction is the approximation towards the truth in order to fix our beliefs for further inquiry. In short, abduction creates, deduction explicates and induction verifies.” (Yu 1994, p.24)

Thus, instead of relying on the either/or choice of deductive and inductive approaches, this type of logic values both deductive and inductive approaches and allows for both hypotheses and interpretations to emerge through a research process counting primarily on the expertise, experience and intuition of researchers (Wheeldon 2010). In other words, research may start at any point of the research cycle to address research questions: a research project typically flows through the cycle at least once, regardless of where it starts (Teddle and Tashakkori 2009). As Timmermans and Tavory (2012) note, abduction, therefore, provides a situational fit between observed facts and rules.

#### **3.3.4. This research – pragmatism and abduction**

This study seeks to explore the RE and its time dimension in relation to behavioural responses of consumers in tourism, which has not been explored empirically in the context of tourism to date. Accordingly, the study employed the pragmatic approach to methodology, which advocates the ‘what works’ approach. The intentional collection of both qualitative and quantitative data, thus, was undertaken by looking at the research question from both subjective and objective points of view, in which multiple paradigms were presented changing in position from one to the other (Teddle and Tashakkori 2009). The research relied on the underlying assumptions of

postpositivism, recognising the benefits of the addition of qualitative data and approaches to the quantitative research, as suggested by Johnson et al. (2007). The first phase of the research valued a deeper understanding and varied meanings of time in tourists' holiday experiences, and as moving on to the following phase the research identified any potential RE with respect to time by verifying statistical trends.

This research adopted the logic of abduction that was to combine qualitative and quantitative methods in a sequential manner (Creswell and Plano Clark 2011). The research started with participants' views on time and their recent holidays focusing on en-route and on-site experiences, and then built up to patterns based on the observed data (an inductive approach). While the research highlighted the strengths of induction, it also took into account the opportunities to test interpretation and theoretical insights obtained from the prior qualitative study deductively. That is, the simultaneous process of induction and deduction was expected to offer an effective and alternative direction to the research methodology (Morgan 2007).

### **3.4. Research methods**

The study was carried out in two phases. The first phase was to explore tourists' use of time on holidays and to understand how time savings achieved by (more) time-efficient tourist transport affect tourist behaviour, which informed the following phase of the research. The second phase investigated the extent to which time savings achieved by (more) time-efficient tourist transport affect tourist behaviour and identified potential forms of the TRE and its impacts on tourist behavioural patterns and its implications for the environment.

#### **3.4.1. Rationale for conducting mixed methods research**

A general argument for mixing methods is to minimise weaknesses and to draw from the strengths of both methods in research (Johnson and Onwuegbuzie 2004), and ultimately to heighten knowledge and validity of research (Schoonenboom and Johnson 2017). Beyond general statements, Creswell and Creswell (2018), however, claim that mixed methods are utilised as a strategy. A popular set of rationales for mixed methods was introduced by Greene et al. in 1989. Greene et al. (1989) analyse fifty-seven studies that used mixed methods and classify the five rationales (Table 3.1).

Since then, over the past decades, researchers (for example, Bryman 2006; Tashakkori and Teddlie 2008; Teddlie and Tashakkori 2009) have attempted to develop, illustrate and supplement an array of different rationales for using mixed methods, ranging from a few broad reasons to detailed reasons and representing various disciplinary contexts. For example, Bryman (2006), claiming that the five rationales of Greene et al. (1989) are rather broad and general, extends this typology by adding a number of additional aspects: sixteen detailed rationales for mixing methods were offered (Table 3.1).

Table 3.1 Typologies of rationales for using mixed methods in research

| <b>Authors</b>                    | <b>Greene et al. (1989)</b>                                                                    | <b>Bryman (2006)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mixed methods research rationales | (a) triangulation<br>(b) complementarity<br>(c) initiation<br>(d) development<br>(e) expansion | (a) triangulation or greater validity<br>(b) Offset<br>(c) Completeness<br>(d) Process<br>(e) different research questions<br>(f) Explanation<br>(g) unexpected results<br>(h) instrument development<br>(i) Sampling<br>(j) Credibility<br>(k) context<br>(l) Illustration<br>(m) utility or improving the usefulness of findings<br>(n) confirm and discover<br>(o) diversity of views<br>(p) enhancement or building upon quantitative/qualitative findings |

Reviewing varied typologies of rationales for mixed methods in the methodological literature, Plano Clark and Ivankova (2016) conclude that rationales should clearly align with the use of mixed methods within a research. Furthermore, Creswell and Plano Clark (2011) emphasise that such lists of rationales suggested should be regarded as a general framework from which researchers can justify their decision of using mixing methods and evaluate alternative choices. According to Bryman (2006), it is essential to explicitly explain the rationales on which mixed methods research is undertaken and the ways in which they are combined in practice.

The main rationales for undertaking mixed methods in this research were as follows. First of all, the research attempted to achieve a more comprehensive understanding of the research questions through the use of combined methods in the study of the same phenomenon of (T)RE in tourism, i.e. methodological triangulation (Greene et al. 1989; Bryman 2006). That is, the research aimed to draw on the strengths of both qualitative (to generate rich and detailed data) and quantitative (to produce reliable outcome by using a sample of larger population) methods by implementing triangulation. This means that the decision to use the mixed method research design was based on the nature of the research questions (Onwuegbuzie and Leech 2006).

Additionally, the research sought to use results from the qualitative method, i.e. interviews, to inform or develop the other, quantitative method, i.e. a questionnaire survey, in which better instruments to obtain more comprehensive closed answers could be developed (defined as the 'development' in Greene et al. 1989; and the 'instrument development' in Bryman 2006). Thus, it was required to make more of augmenting or a reference to qualitative findings by building upon the data collected using a qualitative approach. This was particularly because of the lack of previous research on the impacts of time changes on pro-environmental consumer behaviour in tourism. This implies that relevant quantitative instruments have not yet been developed because national, time-series secondary data have predominantly been used in the (T)RE studies, mostly in the field of energy economics (for example, Haas and Biermayr 2000; Roy 2000; Druckman et al. 2011; Stapleton et al. 2016; Wang et al. 2016; Belaïd et al. 2018). Most of these studies have attempted to identify the RE and TRE in the context of households and personal transport but highlighting the direct RE, which does not explain other potential impacts of it (see Table 2.2 and Table 2.3 in Chapter 2).

Furthermore, there has been very limited research on tourists' time use and its impact on their holiday experiences. Hence, it was inevitable for qualitative research to precede the quantitative research so that a detailed level of understanding of the value of time in tourism and the impacts of time changes gained through interviews could be used to design a questionnaire survey. Research design for this study was led by these rationales. That is, the way of mixing methods pursued sequential contributions (Morgan 2017). In other words, this justification corresponds to the way of linking



different methods: an explicit linkage between studies that construct the overall research.

The purpose of the exploratory sequential design in this study was to first qualitatively explore the issue under review with a small sample of study participants in order to design a feature (i.e. instrument) and then to test this feature out with a large sample (Figure 3.2). The first phase of the study involved a qualitative exploration of the use of time by tourists and how perceived time changes affect tourist behaviour during holiday in which in-depth thematic data (people's words) were collected from interview participants in the UK. In the quantitative phase, numeric data were collected from survey participants at a larger scale. The analysis and findings of both data collection methods were then presented in the two subsequent chapters (Chapter 4 and 5). Although Morgan (2017) asserts that the sequential design of mixed methods is likely to prioritise one method over the other, both methods in this study could stand alone and make a substantial contribution to the overall study results.

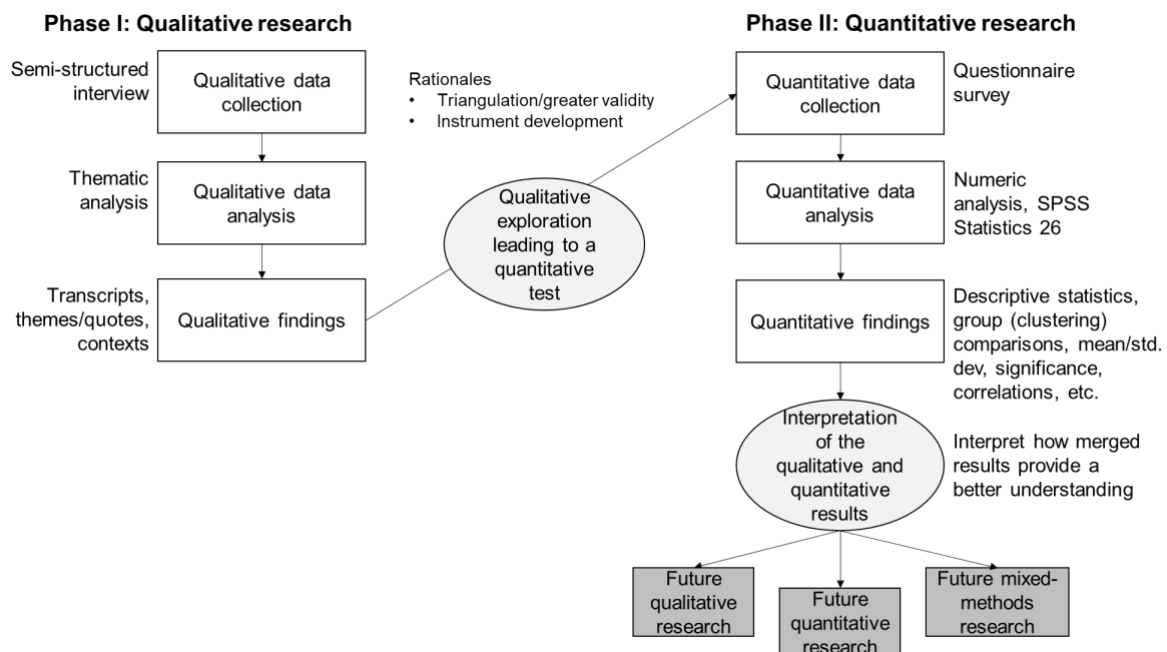


Figure 3.2 The exploratory sequential research design for the study

### **3.4.2. Research methods in previous studies**

When it comes to the exploration of the time concept in the context of tourism, previous studies have used a variety of methods to obtain different types of data. Price and Matthews (2013) conduct in-depth interviews to obtain qualitative data on people's attitudes, views and perceptions towards travel and holiday addressing the concept of time. Yet, this study does not investigate how tourists' attitudes and perceptions of time account for their time use behavioural patterns.

Activity diaries have often been employed in tourism studies as an exploratory, qualitative method (Zillinger 2007) or as a part of mixed methods (Xu et al. 2019) in tourism studies concerning tourists' daily travel and activity patterns. A major disadvantage of this method is that participants are not controlled as they give their own appreciation of their activities (Zillinger 2007). For instance, participants decide not to include certain activities that they think are irrelevant, which may cause potential biases. Besides, self-complete activity diaries are more demanding for participants than other methods such as interviews and questionnaires. Dickinson and Robbins (2005) recognise a drawback of this method in that there can be errors and omission in details in the completed diary because participants may forget to write or record some activities later with incorrect information.

Grinberger et al. (2014) and Shoval et al. (2020) adopt geographic information system (GIS) tools and the global positioning system (GPS) tracking to investigate time-space behavioural patterns of tourists. Similarly, Van der Knaap (1999) uses GIS tools to obtain key data including tourist characteristics and actual time-space behaviour in order to provide better insights for more sustainable tourism development. However, these studies are rather descriptive and do not explore further environmental implications of tourists' time behaviour (use of time) or the potential environmental impacts caused by tourists' use of time en-route and on-site. Furthermore, such data collected using GIS or GPS tools can have confidentiality issues and they only capture tourist behaviour without examining the underlying reasons of this behaviour. Huang et al. (2020) whose study uses technological tools (i.e. a geometric technology and GPS tracking) to explore theme park visitors' spatial-temporal behavioural patterns suggest that further research needs to be carried out to classify tourists based on their temporal behavioural characteristics and to quantify the data, which addresses the

needs of the current, exploratory, study. In response to this call for further research, this study adopted a mixed method approach, aiming to gain detailed insights into time perception and time use of tourists and then to collect the quantitative data in this regard offering a choice experiment scenario in relation to the TRE.

Scenario-based experiments have been frequently applied in tourism studies under a range of scenarios and settings (Kelly et al. 2007; Lacher et al. 2013; Filimonau et al. 2014; Merkert and Beck 2017; Shuqair et al. 2019; Fang et al. 2020; Japutra and Hossain 2020). For instance, Merkert and Beck (2017) use a questionnaire survey including a choice experiment to explore the value of time in tourism. While experimental methods are often criticised by that people's behaviour in hypothetical scenarios is unrealistic, variables can be manipulated and controlled in scenario-based experiments, thus leading to a high level of internal validity (Kim and Jang 2014). This current research employed a scenario-based choice experiment as part of the questionnaire survey that was developed to measure how respondent behaviour would change depending on different scenarios. It allowed for a representation of reality by enabling every respondent to have their own random components for each alternative in a holiday setting (Merkert and Beck 2017). The estimates of a scenario-based choice experiment enabled the researcher to predict potential occurrence of the TRE and associated behavioural responses of tourists.

### **3.5. Research design for Phase I – Semi-structured interview**

Interviews are usually undertaken involving some form of a purposeful conversation (Burgess 1984). In the first phase of this research, person-to-person semi-structured interviews were used to obtain data through active conversational engagement by interviewer and interviewee around the research topics, i.e. tourist holiday experiences relating to time. Thus, it is important for a researcher to recognise and be trained in different skills required for this kind of conversation such as attentive listening skills. However, the qualitative research using semi-structured interviews can be time consuming to collect and analyse data, and it is not suitable for making statistical generalisations about the entire population (Saunders et al. 2009).

Interviews were carried out in order to obtain in-depth information about time use patterns and holiday experiences including the potential effects of technological developments in tourist transport, as it was not possible to directly observe people's feelings, behaviour or how they would interpret the world around them in the context of tourism (Merriam and Tisdell 2016). Thus, it was necessary to interview people, in this case tourists, who had specific recent holiday experiences to share the relevant information in a clear and more comprehensive manner.

### **3.5.1. Interview design**

More or less structured questions in the semi-structured interviews were essential to obtain specific data from all participants despite having flexibility in wording or the order of questions (Merriam and Tisdell 2016). Most questions were open-ended and they proceeded from the general to the more focused (Rubin and Rubin 2004). However, the researcher flexibly responded to the emerging view of the respondent or new ideas in relation to the interview topic, and interviewees could also ask any questions at any time relevant to the interview. The list of topics addressed in the interview design was drawn on the research objectives and lists of emerging themes from the literature reviewed, such as Walsh et al. (1990); Hornik and Zakay (1996); Lyons et al. (2007); Stein (2012); Larsen and Guiver (2013); Dickinson and Peeters (2014). Previous studies were used as resources to develop questions around the guide topics that highlight the importance of understanding the perception of travel and time and time use behaviour in the tourism context.

The conversational and inquiry goals of the study were maintained by designing the list of questions including five different types of questions at different stages of interview, as addressed by Patton (2013): 1) Introductory questions: experience and behaviour questions; 2) transition questions: value questions; feeling questions; 3) key questions: feeling question; experience and behaviour questions; 4) transition questions: knowledge questions; attitude questions; and 5) closing questions.

Interviews started with some introductory questions asking about recent holiday experiences. After building rapport with participants, questions regarding the perceived speed and use of time in daily life, which were linked to the key questions, were asked slowly moving from one to another topic. The key questions, i.e. questions

relating to the perceived speed and use of time; and behavioural questions regarding time changes in the holiday context, were asked reflecting upon their recent holiday experiences. This part of questions was most relevant to the research questions and purpose of the study. After, some questions were asked about any pro-environmental behaviour on holiday from the past experiences of the participants. These questions were kept quite broad so that participants could easily answer. Finally, the closing question provided the participants with an opportunity to add further information or reflect. The overall organisation of questions shaped the interview protocol towards an inquiry-based conversation and as part of the interview protocol. A possible list of prompts under each of the key questions was included in the interview protocol to be able to enrich the data by taking the interviewees in several different directions (Jacob and Furgerson 2012) (see Appendix 1 for a copy of interview protocol).

Table 3.2 shows how interview questions were developed by presenting the relevant concepts and research questions. Despite not entirely relying on the list, it was important to have the formed questions at hand to ensure consistency between interviews and to increase the reliability of the findings. However, the main questions evolved and expanded as interviews repeated.

Table 3.2 Conceptual table for interview design

| <b>Concept to test</b>                                      | <b>Underpinning area of inquiry</b>                                 | <b>Interview question</b>                                                                                        |
|-------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Introductory questions                                      |                                                                     |                                                                                                                  |
| Holiday context                                             | To generally understand tourists' holiday experience (Ice-breaking) | Could you tell me about your holidays during the past 12 months?                                                 |
| Perception and use of time in everyday life                 | To explore how tourists use and perceive time in their daily life   | Can you tell me about how busy your typical day is?                                                              |
|                                                             |                                                                     | Can you tell me about the situation when you feel you do not have time?                                          |
|                                                             |                                                                     | How much of your time during an average week is spent doing things that you dislike or you feel waste your time? |
| Part A: The use of time, attitudes towards time on holidays |                                                                     |                                                                                                                  |
| Use of time on holiday                                      | To explore how tourists plan their activities at                    | How do you plan holidays in terms of time?                                                                       |

|                                                                   |                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                   | destinations and what are the factors influencing it                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                   |                                                                                                                                      | How do you spend your time at a destination?                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Use of time en-route                                              | To explore how tourists utilise the time en-route                                                                                    | Can I ask you to recall the single most significant holiday over the past 12 months for the next 2 questions?<br><br>Reflecting on the experience, how did you spend your time when on travelling to/from a destination?                                                                                                                                                                                                                                                                              |
| Choice of mode of transport                                       | To explore the time effect on the choice of transport modes                                                                          | What made you choose the transport mode to and from the (destination)?                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Use of time on-site                                               | To examine how tourists plan and organise time use on-site; to explore the impact of time availability on activities at destination  | (Reflecting on the experience), and how did you spend your time at the (destination)? Or, what did you do?                                                                                                                                                                                                                                                                                                                                                                                            |
| Part B: Time savings en-route/on-site affecting tourist behaviour |                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| TRE                                                               | To understand the impact of faster travel on different holiday experiences (choice of transport mode, destination, activities, etc.) | Now, imagine there has been a technological improvement which enables planes (or respondent's recently used transport to a destination) to fly even faster and/or cover longer distance within the same time. Considering this, I'd like to talk to you about your view on how you see your holidays changing in terms of the 1) distance travelled 2) time spent at a destination.<br>Again, reflecting on your single most significant holiday during the past 12 months, what would you have done? |
| TRE                                                               | To explore the impact of faster travel on behavioural changes on-site                                                                | Can you describe what you would do at destination(s) if you could get to the places more                                                                                                                                                                                                                                                                                                                                                                                                              |

|                                               |                                                                                                         |                                                                                                                                                                                                 |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               |                                                                                                         | quickly than planned thanks to the technology?                                                                                                                                                  |
| Perception on time savings                    | To investigate tourist feelings about time saving affecting their behaviour on-site                     | What do you think about potential time savings at a destination?                                                                                                                                |
| Part C: Understanding of time                 |                                                                                                         |                                                                                                                                                                                                 |
| Attitudes towards time                        | To explore the attitudes of tourists towards time relating to holidays (compared to time in daily life) | How do you feel about time when it comes to a holiday in general?                                                                                                                               |
| Perception on travel time for holiday         | To examine how they perceive travelling time                                                            | Then, how do you feel about time spending specifically on travelling for a holiday?                                                                                                             |
| Ideal holiday and time                        | To explore individual tourists' preferred holidays in terms of time                                     | Tell me about an ideal holiday for you from the perspective of time.                                                                                                                            |
| Part D: Tourists' pro-environmental attitudes |                                                                                                         |                                                                                                                                                                                                 |
| Knowledge of tourism's environmental impacts  | To investigate tourists' knowledge and understanding of the environmental impacts of tourism            | Tourism can be a source of environmental damage. Now, I'd like to talk to you about environmental impacts of tourism. Can you tell me anything you know about environmental impacts of tourism? |
| Pro-environmental tourist behaviour           | To examine tourists' pro-environmental behaviour/experiences                                            | Can you give me any examples of where you have tried to reduce your environmental impact in tourism?                                                                                            |
| Concluding remarks                            |                                                                                                         |                                                                                                                                                                                                 |
| N/A                                           | To conclude and summarise the interview                                                                 | Is there anything else you would like to tell me about related to time and travel on holiday?                                                                                                   |
|                                               |                                                                                                         | Do you have any questions about the project or interview?                                                                                                                                       |

### 3.5.2. Pilot study and Sampling

A pilot study in qualitative research can help the researcher to clearly define the focus of the study, to moderate obvious ambiguities and to concentrate on developing the

interview techniques (Frankland and Bloor 1999). However, separate pilot work is often considered not essential in qualitative research as qualitative data collection often progress in which subsequent interviews can gain insights from the previous ones (Morse 1997). Nevertheless, this research undertook two pilot interviews. The pilot study aimed to: 1) ensure interview questions align with research questions; 2) test the interview protocol; and 3) receive feedback on the interview protocol. As a result of piloting, some questions were rephrased, and the structure of the interview questions was reordered to yield better information sequentially. That is, the pilot was helpful in taking a further step forward in developing a more appropriate research instrument for participants.

The study population was represented by tourists residing in the UK. However, due to its broad nature, interviews aimed at anyone with recent holiday experiences, distinguishing between major categories of tourists wherever possible. Thus, a non-probability purposive sampling was employed to identify and select information-rich cases where a researcher explores their research question and gains insights (Saunders et al. 2009). This form of sampling is frequently used with a very small sample and, thus, is not regarded as statistically representative of the population. Nonetheless, this sampling technique was appropriate in this current study in order to identify particularly informative individuals fitting in-depth interviews, from which the most could be learned.

Samples were selected when meeting two criteria with the consideration of the suggestion by Patton (2013): a consumer in tourism living in the UK and who travelled for a holiday purpose at least once over the past twelve months either within the UK or overseas. The second criterion was to potentially compare tourists' behaviour in the stage of analysis; therefore, samples were purposefully balanced in a way that study participants could share different views reflecting on their diverse holiday experiences and characteristics. For instance, one shared their experience based on their weekend break in the UK and another one discussed their holiday that was outside of Europe for longer period. Individuals who met these criteria were then selected using a snowball sampling strategy, where new informative participants were referred to by early key participants (Merriam and Tisdell 2016), within the UK. Initial informants were identified across Bournemouth, Dorset. Sampling aimed to achieve comparability



across different types of cases (tourists) on an aspect of interest, i.e. gender, family status and occupation for diversity and data richness. The size of the sample was determined by informational consideration and heterogeneous mixtures, i.e. data saturation. In the early data analysis process of the first ten interviews, a fairly exhaustive data set within the interviews was created and new codes in the later interviews appeared to be variations on existing themes (Guest et al. 2006). The profile of study participants is illustrated in Table 3.3.

Table 3.3 Interview participants (N=13)

| Pseudonym                                              | Age range    | Gender | Travel context                       |                           |                             |
|--------------------------------------------------------|--------------|--------|--------------------------------------|---------------------------|-----------------------------|
|                                                        |              |        | Family status (child with age range) | Travel companion          | Length of stay <sup>a</sup> |
| Domestic holiday <sup>b</sup>                          |              |        |                                      |                           |                             |
| Daisy                                                  | In their 30s | F      | No child                             | Family (parents)          | Weekends/ Short break       |
| Vincent                                                | In their 30s | M      | No child                             | Friends                   | Week holiday                |
| Betty                                                  | In their 30s | F      | One (0-5)                            | Family (child) and friend | Week holiday                |
| International holiday (Europe) <sup>b</sup>            |              |        |                                      |                           |                             |
| Andre                                                  | In their 20s | M      | No child                             | Partner                   | Week holiday                |
| Ana                                                    | In their 20s | F      | No child                             | Family (grandparent)      | Longer holiday              |
| Muhammad                                               | In their 30s | M      | One (0-5)                            | Solo                      | Week holiday                |
| David                                                  | In their 50s | M      | No child                             | Partner                   | Week holiday                |
| Rosa                                                   | In their 20s | F      | No child                             | Partner                   | Week holiday                |
| May                                                    | In their 20s | F      | No child                             | Friend                    | Weekends/ Short break       |
| International holiday (Outside of Europe) <sup>b</sup> |              |        |                                      |                           |                             |
| Cristina                                               | In their 20s | F      | No child                             | Family (parent)           | Longer holiday              |
| Alfonso                                                | In their 30s | M      | No child                             | Family (parents/siblings) | Longer holiday              |
| Jessica                                                | In their 30s | F      | One (0-5) One (6-17)                 | Family (spouse/children)  | Longer holiday              |
| Julie                                                  | In their 50s | F      | One (18+)                            | Family (spouse)           | Longer holiday              |

a. Weekends/Short break (1-3 days), Week holiday (up to 7 days), Longer holiday (+7 days)

b. Most significant recent holiday destination

### **3.5.3. Data collection**

Once the informed consent was handed over to the researcher, the participants were notified that audio recording of the interview began. The key research questions were asked, but with flexibility of wordings and the order. At the end of each interview, individual participants were asked whether they were willing to take part in any follow-up interview afterwards if required.

Thirteen interviews were undertaken during the period of 6 December 2018 and 12 February 2019. The location and timing of the interview were arranged at each participant's convenience. The interview locations were met the pre-determined criteria: a place where the interviewee feels comfortable and convenient; a place where noise does not affect the recording and a place where other people are not within hearing distance (privacy).

The interviews were recorded on digital recording devices. The recordings were deleted from the devices after being transmitted to be saved in an encrypted memory stick for transcribing. Interviews lasted between 26 minutes and 86 minutes, with 56 minutes on average. Additional note taking was essential to pay greater attention on the participant's point of view and lived experience as well as their non-verbal expressions. No incentives were offered.

### **3.5.4. Data processing and thematic analysis**

The audio recordings from each interview were transcribed verbatim. Data collection and analysis processes in this research happened simultaneously. This is because qualitative design is emergent, in which a researcher does not realise ahead of time where to look next unless data are analysed as they are being collected (Merriam and Tisdell 2016). More specifically, every interview was audio-recorded and then transcribed into written form so that they could be studied in detail. The entire transcript was read repeatedly for the researcher to familiarise with the data and then to organise the data in a visually clear way to analyse, i.e. according to the research objectives.

After transcribing the recording of each interview, thematic analysis following the analysis process of Braun and Clarke (2006) began with assigning preliminary codes to the various aspects of the data collected, in which all data were coded and then collated together within each code, excluding unusable 'fillers' in the interviews (Burnard 1991). A selection of codes was continuously developed and defined across the entire data set and throughout the analysis.

Several themes were constructed by drawing together of the codes and organised to present the findings from the qualitative data in a meaningful way. At this stage, the relationship between themes and between different levels of themes were found to place a significance on individual themes, after which some themes were combined, discarded and refined. Themes were then reviewed to consider if they appeared in a coherent manner between each other and if they reflected the entire data set and research objectives. After all, some themes were redefined to best demonstrate the story of the overall data set and a few sub-themes were created under rather complex main themes. Each transcript was worked through with the list of codes and sub-themes. All items of each code were collected, based on which the findings were written under several sections using various examples of data that have been filed under each section, as suggested by Burnard (1991).

For instance, the quotes below described how these participants felt about time passing on holiday, compared with time passing in everyday life. Both explained how 'fast' time was passing on holiday (coded – highlighted in blue) and illustrated the reasons why they thought in such way (coded – highlighted in green). The final version of thematic map presenting themes and codes is shown in the following Chapter with qualitative research findings (Figure 4.2).

*"I think time on holidays flies because you are exposed to many different activities above all... If you are going to completely different countries from yours, you are experiencing also cultural shock. So, time flies."* (Cristina)

*"Daily life seems it's slow motion whereas when I'm on holiday... it might be because I'm in a new place."* (May)

To check the validity of data analysis following the suggestion of Burnard (1991), three participants were re-contacted and asked to read through the transcript of their own

interview. They were asked to briefly summarise what they saw as the key points. Then, the lists of these points from the selected participants were compared and discussed with each other and with the researcher's list of themes until a certain level of agreement, in which minor adjustments were made to the list. However, this approach may constitute a risk of unreliability of the informant memories due to a time-delay between data collection and analysis (Bengtsson 2016). Thus, to enhance validity, an additional check was carried out in which an academic colleague in the field who was not involved in the research was asked to read the transcripts and identify themes. Then, the colleague was asked to judge the researcher's list of themes was reasonable or not, comparing with their own list.

### **3.5.5. Limitations**

The primary limitation of Phase I of this research relates to the criteria for the selection of the research sample. Since the participants were from England, mostly from Bournemouth, the research is limited geographically, which may have affected the participants' holiday experiences. Thus, the findings may not apply to tourists from other regions of the UK or other countries, e.g. Asian origin tourists living in an Asian country.

Besides, the nature of qualitative research limits the size of sample to small; however, "the focus of data generation in qualitative research is on the process rather than the end point of numbers" (Edwards and Holland 2013, p.5). The qualitative design of this research does not allow for generalisation of the findings from interviews, but the richness of information from collected data permit deep understanding on the subject of interest (Merriam and Grenier 2019), which has informed the development of comprehensive quantitative research design. That is, it was based on assumptions about the context-bound nature of knowledge in the research and an interest in the details of tourists' holiday experiences and the time perspective in the holiday context.

Due to the subjectivity of qualitative research, this part of research can be challenged in terms of the issues with marginal validity despite measures for its enhancement. When being interviewed, people may not necessarily remember about the past events. In order to mitigate this matter, interview schedule was modified to best draw out participants' answers about their past holiday experiences after the pilot study. That

is, since holiday experiences were likely to be a significant event, people tended to remember what they had done before/during/after recent holidays; however, to make sure that participants would not muddle their experiences with another occasion, interviews were limited to their 'recent holiday experiences' by holiday travels within the past twelve months. Concerning this aspect, Keegan (2009) addresses that it is the nature of interview where participants are invited to create a narrative and this narrative is constructed by selectively choosing, omitting and reinterpreting aspects of the past. However, this provides a particular perspective rather than invalidating the story (Keegan 2009).

A common concern of face-to-face interviews relates to the phenomenon of social desirability. Social desirability refers to the tendency of people to report things about a particular attitude or behaviour in a socially desirable direction (Nederhof 1985). As social desirability biases can cause validity issues, this research aimed to ensure the integrity of the responses in order to minimise response biases. The measures included participants being repeatedly assured of confidentiality and having no correct answers to the questions (Collins et al. 2005) and the researcher maintaining a neutral stance (Merriam and Tisdell 2016).

### **3.5.6. Ethical considerations**

Before commencing the interview, an Online Ethics Checklist of Bournemouth University was completed in order to address and identify any potential issues in conducting interviews. While there was no identified potential risk, harm or disadvantages on either a participant or the researcher, a thorough review by a Research Ethics Panel was required. Following the panel discussion, the revised Participant Information Sheet (Appendix 2) was approved by the Chair of the panel in accordance with the Code of Practice for Research Degrees of Bournemouth University.

Providing a clear account of research requirements allows potential participants to be aware of what participation would involve for them (Robson 2015). Accordingly, participants were provided with an information sheet to decide whether to participate in interviews. This described what the research is about and why they were chosen. The sheet informed participants of the expected length and location of interviews and

that they were being recorded. Participants were also informed that they could withdraw their consent to participation at any stage without giving a reason. Importantly, the sheet explained how the findings of analyses of interviews would be disseminated and how all the information collected would be stored. Bournemouth University's Research participant privacy notice was provided alongside the information sheet for detailed information of data management. Written consent forms were obtained after providing participants with sufficient time to review and discuss the information sheet. This informed consent involved four elements: competence, voluntarism, full information and comprehension (Cohen et al. 2018), in order to assure that participants' rights to freedom and self-determination have been given appropriate consideration.

The need for anonymity and confidentiality of participants' identities was underlined before participants agreeing to take part in interviews. Although there were a few personal question items such as age range and occupation, it was important to make the aggregated data non-traceable, so that an individual's response is unknowable. The privacy of the informants was respected at all phases of the research by assigning pseudonyms for all personal names. After recordings were transcribed, individuals were not uniquely identifiable.

### **3.5.7. Health and safety issues**

To identify and evaluate any associated hazards or risks to health and safety in relation to interview activities, online risk assessment of Bournemouth University was processed and approved. All interviews were carried out in a place where there was no potential risk for both interviewer and interviewee to minimise insecurities, which might have affected the quality of the research. The interviews were undertaken in publicly accessible places – i.e. local cafes and on campus of Bournemouth University. To maintain contact while conducting interviews, the researcher's itinerary and appointment times including names of participants, details of the places were left with a designated friend. When an arranged interview was not kept, the friend of the researcher was informed of it. At the end of interview, a mobile phone call was placed informing that the schedule had been completed.

### 3.6. Research design for Phase II – A questionnaire survey

In the second phase of the research, a survey was designed and administered. A survey is particularly useful when the researcher seeks exploration of specific relationships between variables occurring in a real-life context (Muijs 2011). By means of a questionnaire survey, data are collected in a standardised form within a relatively short time about how things are at a specific time (Kelly et al. 2003). Quantitative data were collected reflecting upon respondents' recent holiday experiences, using structured research instruments.

#### 3.6.1. Questionnaire design

Following the guidelines of Gillham (2008) and Brace (2018), it was initially considered what information was needed to be collected and what types of questions had to be asked to answer the research questions. There were four main parts in the questionnaire that was designed involving five individual concepts. Each concept is associated with each theme identified in the qualitative research, which is further detailed in Chapter 4. Table 3.4 presents the five key concepts that individually consist of sub-concepts in relation to a research question.

- Part I contained questions associated with respondents' general holiday preferences and their recent holiday experiences that have been taken in the past twelve months.
- Part II investigated respondents' perception and use of time on holiday.
- Part III aimed to examine how respondents' holiday behaviour may change due to the time savings caused by a faster travel technology given en-route, and to investigate respondents' thoughts and views on how other factors may influence their behavioural changes.
- Part IV contained socio-demographic questions.

Table 3.4 Conceptual table for the final questionnaire design

| Concept      |                            | Research question                                                                                 | Survey question  |
|--------------|----------------------------|---------------------------------------------------------------------------------------------------|------------------|
| Availability | Time available for holiday | To investigate if tourists have enough time for going on holidays and managing activities on-site | 1.8a; 1.8b; 1.8c |

|                      |                                              |                                                                                                                                                                                             |                                                                                                                             |
|----------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
|                      | Money available for holiday                  | To explore the impact of financial budget available for holidays                                                                                                                            | 4.3.                                                                                                                        |
| Psychological values | Time passing on holiday                      | To explore how tourists perceive the passage of time on holiday (and its impact on the patterns of tourists' time use)                                                                      | 2.1a; 2.1b; 2.1e                                                                                                            |
|                      | Travel time for holiday                      | To explore how tourists perceive the travel time for holiday (and its impact on the patterns of tourists' time use)                                                                         | 2.2a; 2.2b; 2.2c; 2.2d                                                                                                      |
|                      | Time spending on-site                        | To explore how tourists perceive time spending concerning activities at a destination                                                                                                       | 2.2e; 2.2f; 2.2g; 2.2h                                                                                                      |
|                      | Time fluidity                                | To explore how tourists perceive the flow experience of time while on holiday                                                                                                               | 2.1c; 2.1d                                                                                                                  |
|                      | Choice of environmentally friendly transport | To explore tourists' pro-environmental perception and attitudes concerning travel on-site                                                                                                   | 2.4g; 2.4h                                                                                                                  |
| Travel context       |                                              | To identify tourists' travel context (and its impact on the patterns of tourists' time use)                                                                                                 | 1.1.; 1.2.; 1.3.; 1.4.; 1.5.; 1.6.; 1.7a; 1.7b; 1.9a; 1.9b; 1.9c; 1.10.; 1.11.; 1.12.; 1.13.; 1.14.; 4.1.; 4.2.; 4.4.; 4.5. |
| Time use patterns    | En-route                                     | To investigate the patterns of tourists' time use en-route (how they are related to the above three concepts; and TREs)                                                                     | 2.4a; 2.4b; 2.4c                                                                                                            |
|                      | On-site                                      | To investigate the patterns of tourists' time use on-site: time planning/scheduling within a fixed time budget; travel on-site (how they are related to the above three concepts; and TREs) | 2.3a; 2.3b; 2.3c; 2.4d; 2.4e; 2.4f                                                                                          |
| TRE                  | TRE destination choices                      | To explore the impact of faster travel (i.e. time savings on travelling) on destination choices, relating to patterns of time use en-route                                                  | 3.2a; 3.2b; 3.2c; 3.2d; 3.2e                                                                                                |
|                      | TREs en-route                                | To explore the impact of faster travel on behavioural changes on travelling (en-route)                                                                                                      | 3.1a; 3.1b; 3.1c; 3.1d; 3.1g                                                                                                |



|  |                          |                                                                                                        |                                          |
|--|--------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------|
|  | TREs on-site             | To explore the impact of faster travel on behavioural changes at destinations (on-site)                | 3.3a; 3.3b; 3.3c; 3.3d; 3.3e; 3.1e; 3.1f |
|  | TREs other sites         | To explore the impact of faster travel on behavioural changes in/around home                           | 3.6a; 3.6b; 3.6c                         |
|  | New travel context       | To identify the importance of factors in travel context of tourists in choosing a faster travel option | 3.5a; 3.5b; 3.5c; 3.5d; 3.5e             |
|  | Willingness to pay (WTP) | To explore tourists' WTP for faster travel                                                             | 3.4.                                     |

Overall, the questions were developed based on the findings of qualitative research and the literature review. Conducting interviews prior to the questionnaire survey in Phase I of this research allowed precision concentrating on a key topic and phrasing/wording the questions and developing answers for closed questions (Gillham 2008). For example, the use of car was repeatedly mentioned by a number of interview participants in relation to the use of time at holiday destinations. This, thus, was included in the questionnaire to ask and explore how tourists link car to their holiday experiences and time use on-site, pulling out key words from the quotes.

The consideration of how to structure a questionnaire is of particular importance. Logical sequences help respondents answer without hesitation where the key questions should be appropriately placed (Gillham 2008). General and factual question came first in chronological order, which aimed to allow the respondents to ease into the subject before reaching more detailed questions (Brace 2018). Then, questions about values, attitudes and behaviour that would require more consideration came next. Towards the end of the survey, a few questions were asked to collect socio-demographic data for additional information. Table 3.5 explains the rationales applied into each part of the questionnaire.

Table 3.5 Rationales of each part of the questionnaire

|        | <b>Rationale</b>                                                                                                                                                                                                                      |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part I | This part of the questionnaire was designed to help the respondents get into the mindset of the subject matter, i.e. holidays, and direct their thinking to provide more considered answers to the key topics to follow (Brace 2018). |

|          |                                                                                                                                                                                                                                                                                                                            |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part II  | In this part of the questionnaire, the questions were asked in chronological order of a holiday (Gillham 2008), i.e. perception of time in the holiday context in general, perception of time on travelling to/from a destination and then at a destination, and time use relating destination activities and experiences. |
| Part III | A scenario was provided where every respondent could apply the intervention of a time saving transport technology to a holiday destination into their holiday experiences.                                                                                                                                                 |
| Part IV  | Following the guideline by Oppenheim (2000), personal information was asked at the end of the questionnaire with a clear statement explaining that personal data would not be identifiable or shared.                                                                                                                      |

When it comes to Part III, realistic holiday scenarios were developed for UK tourists taking in six different destinations. The six destinations were initially selected not only because they were popular within tourists in the UK, but also each represented a place with a different travel distance (short, medium and long-haul) from the UK. The destinations were split into two types of holiday, i.e. city break and beach holiday, which were most common types of holiday that UK tourists take (Association of British Travel Agents, ABTA, 2018; 2019). Specific destinations under each category were purposefully selected as they were top holiday destinations by UK tourists with consideration of the distance to travel to reach the destination (ABTA 2018; 2019): Majorca; Santorini; Cancun for beach destinations Rome; Istanbul; Bangkok for city destinations, listed from short to long-haul travel distance, respectively. The latter categorisation was based on the interview findings from Phase I that have revealed travel distance would affect the potential TRE occurrence. The purpose of using such scenarios was to offer realistic examples to respondents for their behavioural choices and to compare the findings of the randomly chosen scenarios and thus a choice scenario was randomly assigned to each respondent.

### **3.6.2. Pilot study**

The pilot test was undertaken in October 2019 to identify any potential problems in the research instrument and protocol prior to survey administration. Both online and paper pilot surveys were carried out in order to determine the more effective method to adopt for the main study (see Appendix 3 for a copy of the questionnaire used for pilot). Purposive sampling was applied to recruit potential respondents and then snowball

sampling was adopted subsequently. Samples were selected when meeting two criteria: a consumer in tourism based in the UK; a consumer who travelled for a holiday purpose at least once over the past twelve months either within the UK or overseas, which are the same criteria set for Phase I – interviews. 120 respondents completed questionnaires, 60 via online and 60 by paper in Bournemouth, UK, with 20 per each scenario for comparison analysis. When it comes to the paper version, each respondent was able to pick any of the papers prepared, starting from ten sets of the six scenario questionnaires. In the online version, respondents were provided with six different links to each scenario and they had an equal chance to choose one to complete a survey. Each link was closed to receive any new respondent once it reached the desired number of completed questionnaires, i.e. ten. The online survey was conducted using JISC, an online survey platform ([www.onlinesurveys.ac.uk](http://www.onlinesurveys.ac.uk)).

The pilot was carried out with specific aims including:

- Checking length and layout;
- Identifying questions were correctly articulated and outlined;
- Checking sampling process and its application;
- Evaluating appropriateness of survey method, i.e. online or paper survey;
- Testing functionality and usability of the survey website;
- Running preliminary data entry and analysis.

A few issues were identified following the pilot test. First, there were missing answers found in the paper version of the pilot survey, particularly relating to the key questions, whereas there was no missing answer in the online version. This is because in the online survey, key questions were set to require respondents to answer. Missing answers throughout caused issues in running certain statistical analyses. Therefore, it was determined to carry out an online survey exclusively. Secondly, it took longer time to collect data through papers than obtaining data via online. When potential respondents were approached and presented with the survey sheet, it was often turned down due to length of the survey (i.e. the maximum time spent on completing was approximately 40 minutes for the paper survey and approximately 16 minutes for online survey). Principal Component Analysis (PCA) in SPSS Statistics 26 was performed to determine the underlying dimensions that were closely related to the measuring concepts, i.e. time perception and time use. That is, PCA was employed in

the pilot study to simplify the interpretation of the variables (factors) under a particular construct, which then allows the enhancement of the questionnaire design for the main survey. Following PCA, sets of questions were removed for the main survey, which brought a shorter completion time in the main survey (median 11.9 minutes and average 12.7 minutes).

Multiple analyses were run, and subsequent amendments to the questionnaire were made on:

- PART I initially consisted of questions asking respondents about their recent holiday experiences. However, a few more questions about holiday preferences were added for further analysis against the main questions. Accordingly, PART I was divided into two subtopics of general holiday preferences and recent holiday experiences.
- PCA was run on the questions measuring psychological values and time use in PART II and PART III. Out of 33 questions, three questions about time availability were moved to PART I for coherence where one of the questions was restated to accurately obtain the necessary information.
- 30 questions were categorised into two groups: psychological values (21 questions) and time use (nine questions). Subsequently, PCA was carried out several times on the two groups of sets of questions. Seven cross-loading items in total were removed: six items from psychological values and one from time use. Then, one more question was added to measure time use patterns – en-route.
- The list of 24 questions was reviewed again and two questions were excluded from it as they were found not to measure a time related concept, either psychological values or time use.
- Q3 in PART III was initially a multiple-choice question (single response). While the question was to explore respondents' behavioural changes, respondents might choose a response where they could not exactly reflect their answer. Thus, the question was turned into five-point Likert scale questions (i.e. five options for an answer to five individual Likert scale questions), from least likely to most likely. Brace (2018) underlines the effect of Likert scale questions that investigate the specific aspects of attitudes that drive behaviour and choices.

- Answers to an open-ended question (Q4) in PART III were reviewed, and a few common answers were detected. Considering this, the top three answers were worded and included as answers to closed questions in the final version of the questionnaire to simplify analysis with the data collected.
- While the pilot study was conducted based on the original design of six different scenarios in PART III, a series of statistical analyses showed that the responses were not significantly different. Thus, only one scenario was used for the final survey in which the example destination was related to the most popular tourist destination with UK tourists (i.e. the Mediterranean) (ABTA 2017). In other words, the original idea of conducting the choice experiment was abandoned in favour of a single scenario study following the results of the pre-test. In the final survey, after reading the scenario given, respondents were asked to answer questions from Question 3.2 to 3.6.
- The order of questions in PART II and III was rearranged to make the flow more logical and clearer for respondents. Q6 and Q8 in PART IV were moved into PART I to improve the question flow of the survey.
- Some minor changes were made throughout with regard to the wordings and the order of the items to avoid systematic biases and misleading results.

### **3.6.3. Sampling**

A probability sample draws randomly from the wider population and seeks representativeness of the population (Saunders et al. 2009). Therefore, it is useful to make generalisations, compared to a non-probability sample that seeks to represent only a particular group, deliberately avoiding representativeness (Cohen et al. 2018). The research required a representative sample in order to investigate the impacts of time savings on general consumer's behavioural changes in the tourism context, advocating, thus, a probability sample. It was important that the sample represented the population in the UK in order to reach participants from a range of backgrounds, providing the research with a better idea of how tourists in the country might respond to the questions. With the use of Prolific's<sup>4</sup> sampling tool, a representative sample was ensured to be UK consumers in tourism (a current resident of the UK) in terms of key socio-demographic variables including age, sex and ethnicity. The sampling tool used

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<sup>4</sup> For detailed information about Prolific, see Section 3.6.4. Data collection.

on the website involved stratified sampling that is accomplished by dividing the population into homogenous groups called strata, in which each group contains subjects with similar characteristics (Cohen et al. 2018). The sample was taken from each of these strata, i.e. age, sex and ethnicity, using random sampling:

- Age: 18-27, 28-37, 38-47, 48 -57 and 58 and above.
- Sex: Female and Male
- Ethnicity: White, Mixed, Asian, Black and Other, by reference to the UK ONS

The 2011 Census data by the UK ONS were used to calculate the distribution of the variables. Estimation of the sample size was determined considering previous studies such as Sun and Lin (2018) that conducted a questionnaire survey with a total of 367 respondents to investigate people' travel behaviour changes due to faster travel by high-speed railway. The intended sample size was 400 following the recommendations by Saunders et al. (2009) and Singh (2016). The sampling tool by Prolific stratified the sample across three socio-demographics. However, it is noted that this representative sample does not guarantee that the results are perfectly generalisable to the population, but it does help improve generalisability because not all UK population are registered with Prolific.

Another key criterion for potential participants was that they had to have holiday experiences previously and be potential tourists. This is because the survey asked a series of questions including their general holiday experiences and preferences. This criterion was met by the sample, as all such questions were responded accordingly.

#### **3.6.4. Data collection**

A questionnaire survey was conducted online in order to obtain a large set of numeric data on tourists' time perception and time use patterns and their relationships with the potential TRE occurrence in a short time based on a representative sample. A similar cover letter to the one used in the pilot study was attached as the very first page of the online questionnaire, which illustrated the study briefly and featured contact details of the researcher. A copy of the questionnaire including the cover letter can be found in Appendix 4. Participant Information Sheet was available to download (see Appendix

5 for the copy for Participant Information Sheet). Also, the recruitment criteria were explained (see Section 3.6.3. Sampling) before agreeing to be in the study.

The questionnaires for the main survey were collected online via Prolific, which was selected due to cost and time effectiveness of data collection. Prolific ([www.prolific.co](http://www.prolific.co)) is an online survey platform which enables researchers to connect with their target participants, offering representative samples of the UK population. Study participants earned a small reward for their time in participating in studies through Prolific. Besides, the major advantage of using Prolific lied in its fast response times as well as high quality data (Peer et al. 2017).

Along with these, another advantage of online survey research was identified. As noted by Wright (2005), Internet enables individuals who may feel hesitant to meet face-to-face to communicate comfortably. Thus, the online survey was selected in this research to reach these individuals and groups in larger numbers than would it have been possible through a face-to-face survey, in which they could share their views, attitudes and interests concerning an activity, issue or experience a more relaxing environment. However, there might be sampling issues such as inaccurate demographic data as there is no guarantee that participants report accurate characteristics or demographic information (Wright 2005). One of the key tools of Prolific was that they ensure representative samples of the UK; they allowed for the minimal impact of this limitation. The sample was stratified across three demographics: age, sex and ethnicity by using census data from the UK ONS 2011 to divide the sample into subgroups with the same proportions as the national population (by using the data the participants provided to Prolific when they joined). This information was cross-checked with the information given by the participants in the end of the current research. In total, 404 useable questionnaires were collected in February 2020.

### **3.6.5. Data processing and analysis**

The processing and analysis of data were divided into three steps: 1) data management; 2) exploratory data analysis and 3) statistical analysis. Once data were collected, individual responses were automatically coded. To ensure data quality, the research reviewed coded data against the raw data in the surveys. While majority of data were coded correctly, the researcher observed the coding had not been

completed in several items, which were sorted and coded in preparation for the purpose of data analysis and interpretation. The responses of an open-ended question about a recent holiday destination were listed and grouped into three categories that were developed by distance, i.e. UK, Europe, outside of Europe, after the data collection. In this process, it was made sure that all the codes were mutually exclusive and applied consistently throughout (Singh 2016). The next task was data cleaning. A careful attention was paid into range checks; consistency checks and missing values, following the guide from Singh (2016).

- Range checks: There were two questions obtaining continuous variables (Q1.11 asking for the length of stay in nights and Q1.14 asking for places they have visited). These were checked in that if there was any response which fell outside the normal range, and abnormal value was found.
- Consistency checks: The logics in data were checked for consistency. For instance, it was checked that those who answered to have recently travelled with their child/children answered appropriately in the questions asking whether they had child/children or not, and if so, how old they were, etc. These checks helped minimise the errors in different variables if they were logically impossible or very unlikely. In this step, answering patterns were also checked to identify respondents who answered in the same patterns, e.g. choosing the first option to a series of questions, in which none of responses was removed.
- Missing values: Missing values were coded as -9 to ensure these did not interfere with the other responses. There were two types of missing values: first, where an answer to a question was deliberately blank since it did not apply to the individual respondent (e.g. ages of children in the household – no answer was given to this by those who did not have children); or not an adequate response was given for open questions. The former cases were expected as answers reflected individual's circumstances and no answer was also an answer. For the latter cases however, missing data were carefully checked because they were directly related to the quality of statistical inferences. There were two variables which had 1.2% of missing within each data, which however was considered inconsequential (Dong and Peng 2013).



Following the data preparation, a series of data analyses was carried out using the latest version of analysis software, IBM SPSS Statistics 26. Data analyses consisted of non-parametric statistical tests which referred to the methods of statistical analysis, where the data were not normally distributed (categorical). The non-parametric statistical tests used in this research included (Blair et al. 2014):

- Mann-Whitney U test: to examine whether two independent groups are statistically significantly different with the dependent variable being continuous or ordinal.
- Kruskal-Wallis test: to determine if there are statistically significant differences among the group (two or more) means with the dependent variable being continuous or ordinal.
- Spearman's rank-order correlation: to evaluate the strength and direction of the monotonic relationship between two ranked variables.

The analytical procedure is explained in Chapter 5.

### **3.6.6. Limitations**

There are several limitations to the quantitative phase of this research. The quality in quantitative research is achieved through validity and reliability of measurement instruments. Validity is concerned with the accuracy of a measure. That is, when researchers measure a concept, the question of validity is whether they are measuring what they intended to measure, not some other concept (Drost 2011). Internal validity refers to the validity of the research itself. In this study, internal validity has been ensured using the qualitative interview research (Phase I) in its design and comparing the results of the questionnaire with the findings of previous studies. Content validity is defined as the extent to which the instrument covers the entire theoretical construct it was designed to measure (Heale and Twycross 2015). To establish content validity, four experts including the PhD supervisors reviewed and evaluated the questionnaire and also added open comments to ensure the measures were meaningful and logical to the respondents (Tsang et al. 2017). This rational-intuitive way poses weaknesses of being subjective and unclear with the rules to evaluate. Thus, the empirical method was also used to determine the items to be included on a measure. More specifically, a statistical method, PCA, was used at the pilot study stage to select items as

recommended by Basham et al. (2010). Construct validity refers to the extent to which inferences can be drawn from test scores to the concept that is being studied. Following the guidelines of Tsang et al. (2017), correlation tests were conducted to examine the association patterns between different measures of a construct and those between a construct and other constructs, i.e. on the measures of psychological values and time use patterns. External validity is concerned with the extent to which the results of a study can be generalised to other persons, settings and times (Drost 2011). A probability, i.e. random, sampling was used in this study via Prolific, an online panel. While they were randomly selected as representative of the UK population, it was inevitable that not every resident in the UK was registered in the panel.

Reliability is defined as “the consistency of a measure”, or the issue of the results being consistently obtained each time the instrument is completed (Heale and Twycross 2015, p66). The three key concerns in reliability testing are internal consistency, stability and equivalence. Internal consistency refers to consistency in measurement of the same construct within the instrument (Drost 2011). A test for internal consistency reflects the extent to which all single items within the test are inter-correlated and the most common method for this testing is Cronbach’s alpha. As noted by Hares (2013), Ursachi et al. (2015) and Taber (2018), Cronbach’s alpha has not been used in this study because the set of items in the questionnaire did not employ multiple-indicator measures of the same latent variable that was only one variable. Stability is tested using test-retest reliability testing which is to administer the same test to the same participants once more under similar circumstances and then statistically compare the scores (Heale and Twycross 2015). As this questionnaire was designed as a cross-sectional study in which the data were collected from many individuals at a single point in time, the test-retest approach could not be used. Equivalence is examined through inter-rater reliability test which is a process for determining the degree of agreement between raters, or observers (Heale and Twycross 2015). Inter-rater reliability in this study was not tested because of the time and cost constraints to produce the necessary data as noted by Lavrakas (2008).

However, reliability of the questionnaire in the study was ensured throughout the data collection process in numerous ways. The questionnaire was designed incorporating the findings of the qualitative research in Phase I and the literature reviewed. A formal

pilot study was undertaken prior to the main survey with data collected from 120 respondents, based on which several changes were made. An audit trail, a detailed step by step record of how the data are collected and managed to obtain the findings, described in this chapter can also ease the process of replication of the research and contribute to its reliability (Zohrabi 2013).

### **3.6.7. Ethical considerations**

Before commencing the pilot and main surveys, an Online Ethics Checklist of Bournemouth University was completed in order to ensure that any potential issues were identified and addressed. While the study involved human participants as questionnaire respondents, no potential risk, harm or disadvantages to either a participant or the researcher was identified; therefore, the Checklist was approved as low risk in accordance with the Code of Practice for Research Degrees of Bournemouth University. The survey did not include any sensitive topics or questions, but it asked a series of questions about perception or attitude with regard to time and holiday experiences. In order to minimise any potential stress or anxiety in answering such questions, it was informed in the cover letter that there were no right or wrong answers to the questions and what was important was participants' opinions and all views were relevant to the study.

Participant information sheet was provided to ensure 1) respondents were given appropriate information about the research project and what participation meant in practice and 2) respondents' consent was obtained. It was highlighted in the participant information sheet that respondents were voluntarily participating in the research and they had rights to withdraw at any time without giving a reason. The anonymity of the answers was guaranteed to respondents as completed questionnaires were going to be saved anonymously. This point was highlighted once again in PART IV of the survey (Appendix 4) where a few personal characteristics such as age range, gender or occupation were asked, following a statement that ensured anonymisation of any information collected.

After a careful read of the participant information sheet, participants were required to check a box to indicate consent before accessing the main survey. In this way, participants had the same access to the information they would receive prior to

completing an offline survey. Participants were also given an additional opportunity to finalise their consent in the end of survey, as also detailed by Roberts and Allen (2015). Despite the box to provide consent prior to the survey, consent only would be assumed if a participant actually completed the survey, i.e. by clicking the 'Finish' button, and that anyone wishing to withdraw consent could do so by simply closing the browser window.

### **3.6.8. Health and safety issues**

Risk assessment of Bournemouth University was completed online prior to the pilot study and main survey in order to evaluate any potential risks in association with questionnaire survey activities. Part of the pilot survey was conducted in a blended manner of traditional (paper) and online surveys. The delivery and collection of questionnaires took place at Bournemouth University and around Bournemouth area providing plenty of time to complete. Every time the researcher went out for the delivery or collection, the movements of the researcher were traceable. As the rest of the pilot survey and the main survey took place online, there was no physical risk identified. Participants could voluntarily complete the survey anytime at their convenience on their own device. The survey questions were general and relevant to holiday experiences that did not require any personal or specific information to answer. Thus, there was no other, e.g. psychological, potential risk identified.

## **3.7. Chapter summary**

This chapter aimed to outline how mixed methods have been used integrating qualitative and quantitative approaches to collect and analyse data. The research adopted the exploratory sequential mixed method design in which qualitative research was conducted, followed by quantitative research. The findings of qualitative research, i.e. interviews, informed the development of the questionnaire survey for the following quantitative research. The following chapters cover the findings of interviews, qualitative data analysis, and then the findings of questionnaire surveys, quantitative data analysis.

## **Chapter 4. Analysis and findings of Phase I – qualitative research**

### **4.1. Introduction**

This research stage was an initial exploration of consumer behaviour integrating time perspectives in tourism to extract materials for the development of a questionnaire survey to be used in the Phase II data collection. The objectives for the qualitative stage were:

- 2) To conceptualise the potential RE, integrating the TRE, in tourism by categorising its key dimensions and drivers of the RE
- 3) To explore environmental attitudes and behaviour of tourists
- 4) To examine tourist perception and attitudes towards time in a holiday context
- 5) To explore the key factors that influence time use patterns among tourists alongside tourist choice of mobility, destinations and leisure activities at different stages of a holiday trip

Semi-structured interviews were conducted in order to explore the time dimension in the context of tourism. Figure 4.1 presents the sequence of the findings discussed in this chapter relating to the key themes.

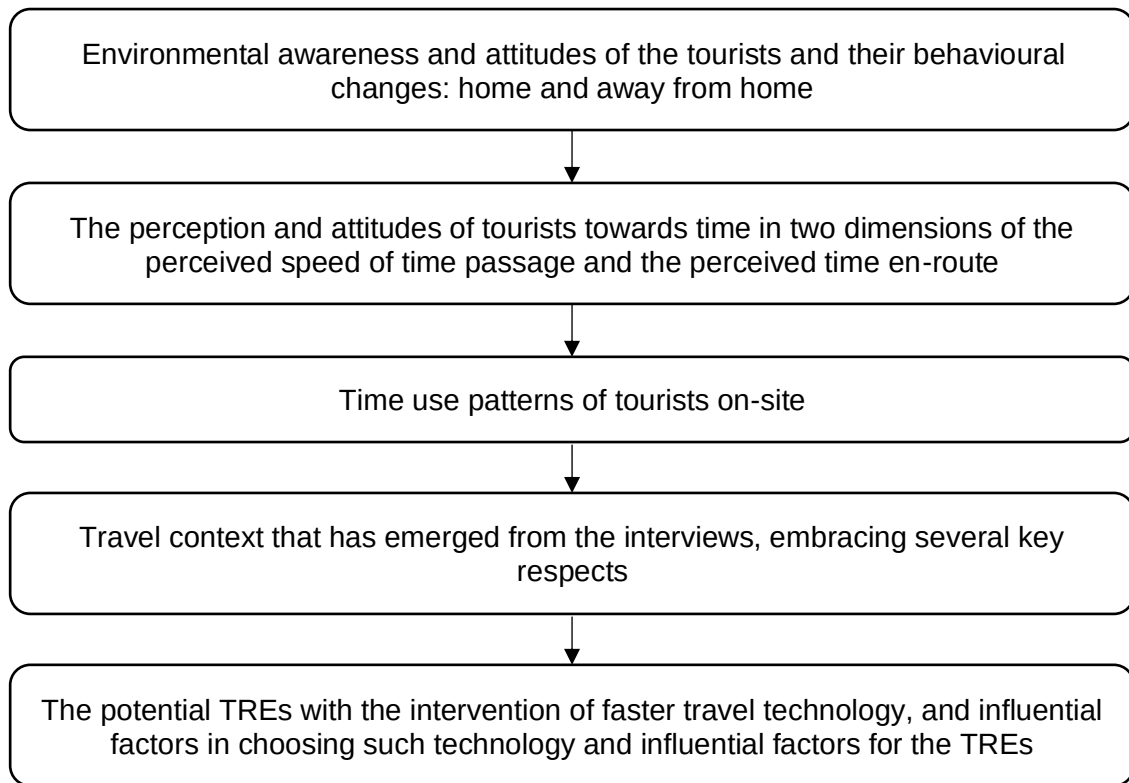


Figure 4.1 Outline of the chapter

This chapter concludes with a section that summarises the main findings and discusses how these have been used to inform the following quantitative phase research.

## **4.2. Overview of the findings**

Following steps of thematic analysis, several themes emerged. Accordingly, thematic maps were developed in steps for final analysis. The final thematic map was created with the six main themes and subthemes under each theme that arose from the interviews as shown in Figure 4.2. The emerging themes were directly related to the dynamic aspects of tourism, i.e. different stages of a holiday trip, from pre-trip/planning to post-trip. Besides, other emerging themes included the aspect of environmental impacts of tourism from a consumer perspective and forms of the potential TREs. The following sections in this chapter present the findings for each of the themes, except a subtheme of tourist socio-demographic characteristics which has been discussed throughout the sections.

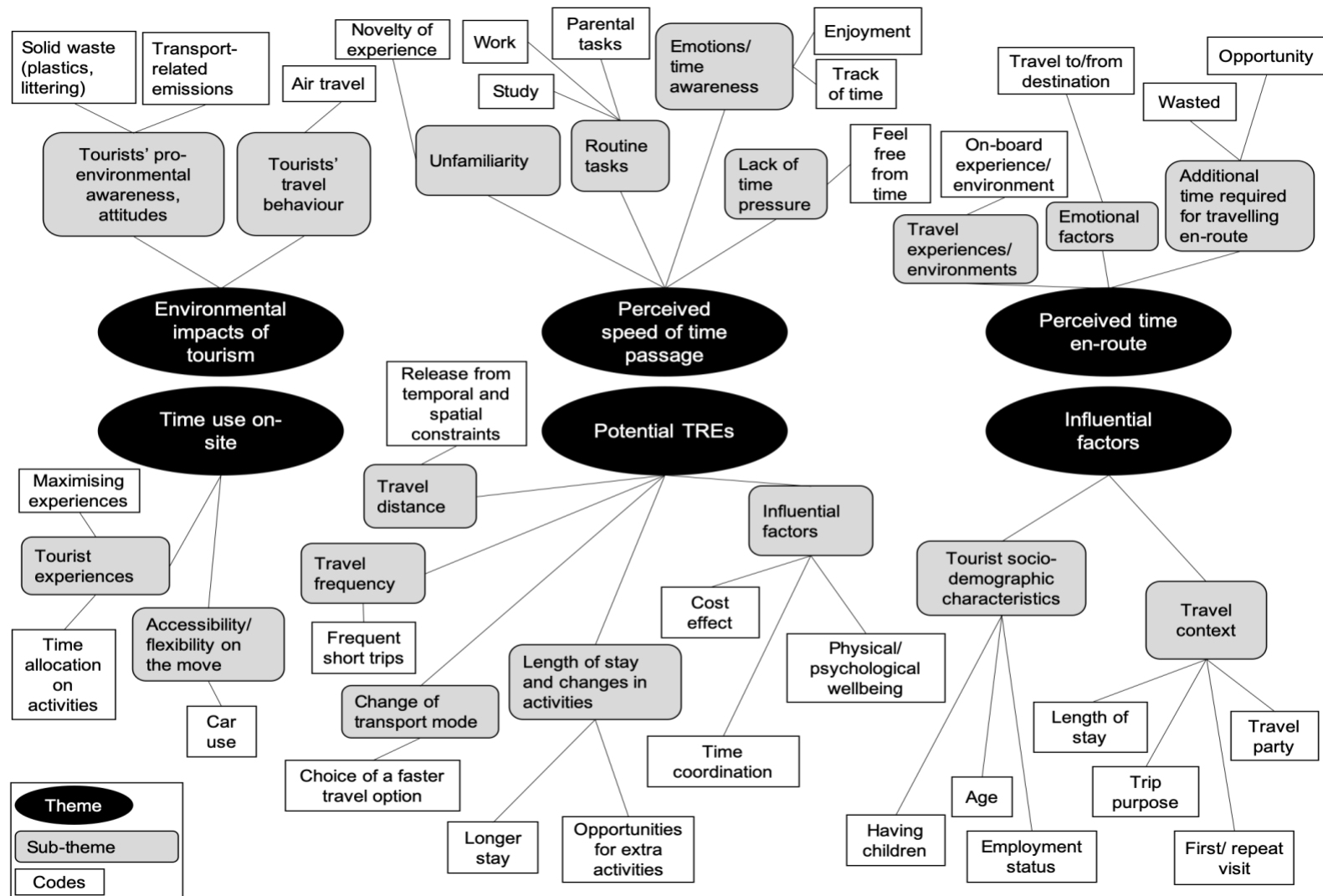


Figure 4.2 Final thematic map

### **4.3. Environmental impacts of tourism: home and away**

It was found that pro-environmental awareness and attitudes and behaviour among the participants were inconsistent between the home and tourism contexts. While all study participants showed their fairly high level of knowledge of and attitudes towards environmental impacts of tourism, this did not necessarily lead to correspondingly less carbon intensive travel behaviour for holidays.

#### **4.3.1. Tourists' pro-environmental awareness and attitudes**

When asked about environmental impacts of tourism, all participants were aware of the significance and diversity of the environmental impacts. Most participants recognised such issues as solid waste, particularly, plastics and littering. Most participants commonly linked the waste and littering issues to coastal areas which they had heard of or seen such as the temporary closure of a Thai island due to environmental damage caused by tourists or the Galapagos Islands facing numerous environmental threats. They considered that those issues had extreme damaging impacts on the marine environment and local landscape. They mainly blamed irresponsible tourist behaviour for causing such problems as tourists were less conscious about the negative consequences of their behaviour due to the temporary nature of their stay at a destination:

*“They [tourists] don’t care about the environment as much on holidays... When you’re home you have bins for recycling but when you’re overseas you don’t think about all these things as you’re not in your own country and own places. People are not conscious about keeping another person’s place clean, or just things like that.” (Daisy)*

*“Because it’s not an area they live in, they staying there for a certain amount of time and they leaving, they don’t give the same care to it, so even just pulling up a private boat and just empty the contents of the toilets and something like or just throwing rubbish just over board you get lots of litter in the sea that we found quite a lot which isn’t very nice.” (Rosa)*

A number of participants saw that the negative consequences of tourism were directly associated with energy use and related carbon emissions. As the following quotes



illustrate, transport-related emissions were not only considered to include the use of transport en-route, but also different modes of transport used on-site for travel and/or tourist activities that are facilitated by transport.

*“Obviously every mode of transport has an impact unless it’s your feet or bike. You use fuel for your car, in coaches, trains they use electricity, steam trains they use coals... so everything has an impact.”* (Betty)

*“There are airplane emissions, which are like environmental impacts as well because of airplane gases. Carbon stuff... and if you take any extra activities over there, which is related to bad stuff on the environment, like gases like riding jet-ski or ATV. This is like another contribution.”* (Alfonso)

*“Well, one main source of the environmental impacts from tourism could be transportation itself. So, the more transportation we have, the more pollutions or emissions we have, you know, in a certain country. You can have many tourists because it’s [tourist destination] very green, they are coming by four-wheel driving cars on the green areas.”* (Muhammad)

Demonstrated awareness of such issues in this group of participants is in line with what previous studies have found about tourist increasing recognition and awareness of the impacts of tourist transport on carbon emissions and climate change (Hares et al. 2010; Dickinson et al. 2013b; Gössling et al. 2017).

#### **4.3.2. Tourists’ travel behaviour**

When it comes to pro-environmental behaviour on holiday, study participants displayed a substantial difference in their behavioural patterns depending on the types of environmental impacts. A key pattern here was around whether their pro-environmental attitudes and concerns were consistent on holiday, i.e. taking pro-environmental behaviour from home to destination, or the spillover effect (Thøgersen 1999). Almost all participants claimed that they complied with their habitual pro-environmental actions from home in the holiday context – trying to reduce litter and to recycle at holiday destinations. In this regard, Laquinto (2015) and Xu et al. (2020) find everyday practices and routines are likely to be transmitted in certain contexts and places. That is, tourists’ everyday pro-environmental practices and actions can

account for their sustainable performances and conscious choices in the context of holidays, in terms of littering and recycling.

However, this association does not seem to account for air travel behaviour in this research. Despite acknowledging airplanes being highly energy and carbon emission intense and displaying pro-environmental concerns, several participants honestly admitted that they had not tried to reduce their carbon footprint in relation to travel behaviour in recent holidays. These findings are consistent with previous research, for example, Hares et al. (2010); Miller et al. (2010); Alcock et al. (2017), that commonly addresses dissonance between awareness, attitudes and actual pro-environmental behaviour of tourists particularly in terms of air travel. In this regard, the Swedish flight shame (*flygskam*) movement, the movement that pledges to avoid air travel by environmentally conscious travellers coined in 2018, has not only increased awareness of air travel impacts on climate change, but also influenced travel behaviour by helping to decrease, e.g. the falling demand for domestic air travel in Sweden and Germany since flight shame debates began (Gössling et al. 2020). At the similar time, the Extinction Rebellion in the UK has stimulated a debate on climate change and inspired environmental movements. An increasing number of celebrities have also been involved in inspiring millions of people to join such emergent movement such as the Swedish climate change activist Greta Thunberg (Mkono et al. 2020).

Participants provided a variety of explanations for their air travel behaviour. Firstly, a number of participants claimed that they would not stop flying or indisputably preferred air travel to other alternatives (e.g. train or coach) due to it being quicker, supporting previous research findings (Juvan and Dolnicar 2014). This implies that the use of time in relation to travelling has implications for the negative environmental impacts of tourism that can be substantial. Particularly with time constraints, pro-environmental consumption behaviour is not necessarily exhibited in a rational sense (Jackson 2005). However, these participants may choose alternative modes that are less carbon intensive despite being slower than flying when the value of the en-route travel time surpasses the value of time, which will be discussed more in Section 4.5 of this Chapter.

Secondly, a few participants justified their air travel by arguing that they took actions to help the environment at home such as recycling, or that they instead did not consume any energy or generated no carbon emissions in and around home while on a holiday. These beliefs served to allow these participants to trade-off flying and other less environmental-friendly practices (e.g. energy consumption; car hire), which is consistent with the findings of Barr et al. (2010) and Büchs (2017).

Thirdly, some participants felt they 'had to' travel by plane because it was the 'only way' to get to somewhere reflecting on their recent holidays whilst in fact there were other options over land or sea (in the context of recent trips within Europe). That is, tourists' less pro-environmental behaviour regarding their travel practices could often be justified by the use of operational limitations of tourism and travel. This supports the findings of Hares et al. (2010) by which such justification is defined as a structural barrier or perceived control barrier for continued flying.

Lastly, participants did not seem to recognise their primary responsibility for taking energy and carbon intensive modes of transport for their holiday trips; instead, they externalised the responsibility, for instance, towards airline companies, infrastructure or government. This may result from the impacts of travel (i.e. carbon emissions and climate change) being less tangible or understandable for the participants, compared to the impacts of littering, as Miller et al. (2010), Dickinson et al. (2013b) and Filimonau et al. (2018) find in their studies. These justifications for air travel behaviour identified by study participants indicate several challenges in promoting voluntary behavioural change for sustainable travel in the tourism industry that attempts to reduce environmental impacts of travelling from tourist holiday trips, particularly achieving GHG emissions reduction from air travel (e.g. by flying less frequently).

#### **4.4. The perceived speed of time passage**

Four elements appeared repeatedly in the discussions among participants as a reason why they felt time was going differently, compared to actual clock time: unfamiliarity, usual demands, emotions/time awareness and lack of time pressure. A holiday trip is a time-out, released from an everyday life. On holiday, individual tourists find themselves in the stage of liminality in which the codes of normal social experience

are dissolved within time and space (Urry 1990). That is, the variables identified reflect study participants having been in a liminoid time which is

“a temporal transition away from everyday time – the time of work, home, routine, clock – to timelessness where the only time you have to keep is the time of the return bus to the airport at the end of the holiday.” (Selänniemi 2003, p27)

By exchanging the time in everyday life for it in holiday, participants experienced distortion to the passage of time.

#### **4.4.1. Unfamiliarity**

To this group of tourists, time seemed to speed up or slow down depending on how much they were exposed to unfamiliarity. This is consistent with Taylor's (2007) suggestion that the speed of time is likely to be determined by how much new information there is to absorb and process (negative correlation). The more of new information there is, the slower time is perceived to pass. Taylor (2011) explains this later linking to age that as people grow older all the experiences have already become more familiar to them. Thus, adults and children perceive the speed of time differently in this sense where adults perceive time goes quicker, though this does not necessarily apply to all contexts. In the context of a holiday, new information means unfamiliarity with new experiences and environments (e.g. new destinations). Considering this, some tourists felt time went slower as they were having new, unfamiliar experiences.

*“Um, I think during the normal day time is passing faster actually because everything is the same. When I go for holidays everything is not the same because I go and visit some things all the time that are different. So, it's longer. Definitely when I am on holidays, it's longer.” (Ana)*

Interestingly, other participants expressed that time on holiday passed the opposite, i.e. faster, than that in everyday life because they enjoyed the unfamiliarity and felt a break from the monotony of daily life as described in the following quotes:

*“I think time on holidays flies because you are exposed to many different activities above all... If you are going to completely different countries from yours, you are experiencing also cultural shock. So, time flies.”* (Cristina)

*“Daily life seems it’s slow motion whereas when I’m on holiday... it might be because I’m in a new place.”* (May)

While there was no agreed view among participants on how time passed while on holiday, it was evident that the passage of time was closely linked to gaining new experiences during their holiday.

#### **4.4.2. Routine tasks**

On holiday, people are not necessarily required to achieve tasks and/or to manage considerable demands as in their usual routine. In this sense, the interviews showed that tourists’ perception of the speed of time on holiday appeared to be different from everyday life because they did not have usual demands and duties at the same level when on holiday such as scheduled activities or responsibilities in terms of work, study or house work (including parental tasks). Some of the participants claimed that they felt time was going slower on holiday because they did not have everyday demands that they had to manage according to time as explained by Rosa.

*“It does generally go much slower because you don’t have as really many demands on you when your time is on your own to plan and do this.”* (Rosa)

That is, the perception of novel stimuli helped them to learn to measure time, i.e. the novelty effect (Yates 2016). It is particularly notable that Betty who travelled with a young child shared her experiences.

*“So, dinner at home would be an hour. You cook it, eat it and you tidy up. When you’re on holiday or going out socialising, it’s 2 hours or 2 and a half hours to achieve the same thing, but you’ve taken far longer. It’s just... you talk, eat, pick... same thing, but it just takes as twice as long, but good thing because the emphasis is there is nothing going on to do afterwards. You can enjoy the actual thing you’re doing without constraints of “I have to wash up! I have to make sure the bins are taken out!” So, it doesn’t matter if it takes 20 minutes for your kid*

*to get dressed on holiday because you're not rushing to get to the next place."*  
(Betty)

On the contrary, one participant explained why he felt time was going faster on holiday with the same reason:

*"You start [a holiday] on Monday, 'Ah, it's Wednesday already. Oh my god, I'm already in the middle of my holiday', when you take kind of one week, 'Oh, this is going so quick!' But when you're working for example, sometimes to pass one week it takes ages."* (Andre)

For this participant, time went rather slower when he had usual demands, relating to their profession. Being on a holiday that does not require routine tasks, thus, distorted time perception for people in varied ways.

#### **4.4.3. Emotions and time awareness**

Just like an adage *'time flies when you are having fun'*, some participants were astonished at how quickly time passed on holiday. They explained this was because they were experiencing positive emotions such as joy, contentment and interest while on holiday (Levine 1997).

*"...I enjoy more [on holiday] than doing things in daily life. Time passes quicker."*  
(May)

*"I would say time is more about mental perception. Sometimes the way...the feelings you have affect the perception of time. If you feel happy and energetic then you can make most of time or you feel time goes quicker."* (Vincent)

At a closer look, holiday experiences and the perception of time passage are likely to be associated with the matter of time awareness. Tourists tend to be highly intrinsically motivated by the enjoyment and satisfaction, and this brings about their less attention paid to temporal information while on holiday (Conti 2001) and allows them to view things through to completion (without spending excessive effort in the process) (Danckert and Allman 2005). For instance, tourists would be less concerned with what time it is now or how much time an activity takes at a holiday destination, given the experiences are enjoyable. Thus, some participants including May and Vincent below

reported that time seemed to pass surprisingly quickly on holiday. In this sense, some participants confessed that they felt time went faster because they did not keep track of time.

*“I don’t want to think about time other than its day light. The sun’s come out I need to eat. Do things throughout the day and when you feel... it doesn’t matter... It’s much more basic thought about time when I’m relaxed.”* (Julie)

*“I think holiday time I would feel flies a bit faster than like normal working time. Because when you’re on a holiday you sort of forget about time.”* (Daisy)

This indicates that there was no reason for study participants to keep checking the time as being on holiday in order to relax and not to stress out with timely scheduled activities like a daily routine. That is, being on holiday involves positive emotions which leads to lack of time awareness, thus resulting in the perception of time speeding up.

#### **4.4.4. Lack of time pressure**

While a holiday is experienced within the limited time budget probably causing constant time pressure and stress, many tourists actually felt more flexible in terms of time on holiday compared to when at home, even those who travelled with children such as Betty.

*“You don’t have that constant pressure to be somewhere... and if you don’t make that day, you just go next day. You have other days... The emphasis is it doesn’t matter if doesn’t get done, so that’s why it feels... longer. You just have that concept of never ending.”* (Betty)

*“...time is much more residuary because I haven’t planned to do in particular or if I have planned so many things to do on the particular day you would be in rush to go from one thing to the next thing... I wouldn’t plan to do so many things to make time pressurised. I think that’s the key to be on holiday. You try to relax and enjoy that time, not to rush.”* (David)

*“This is something that I have to do so I have to go every day for the experience of the job, to work literally... But over there, I’m the queen of my time, so I can manage my time however I want.”* (Alfonso)

Similar to Wajcman (2015), the more tourists are able to determine how their time is spent, the more likely they feel free (from time). As Alfonso mentioned above, tourists generally have autonomous control over their own time, which Goodin et al. (2008, p30) view as 'temporal autonomy'. That is, the idea of holiday, i.e. discretionary time, stands for freedom in the use of time. This is consistent with the findings of Dickinson et al. (2013a) that suggest tourists see tourism as not structured as home life in terms of time, so they feel temporal fluidity, e.g. little pressure of having to be places at specific times. The absence of time pressure on holiday, therefore, explains why tourists may perceive their time passing differently from it in their everyday life.

#### **4.5. The perception of time en-route**

How tourists perceive the travel time to and from a holiday destination was associated with the experiences and environments that the travel time incorporates. Participants expressed mixed views on the travel time that seemingly reflected their emotions during the time. Additional time required for travel en-route such as connecting time was brought up in the discussion on how participants perceive such time.

##### **4.5.1. Perception: travel experiences and environments**

Travel experiences were found to influence perceived travel time required to reach a holiday destination. A long-haul flight could be enjoyable for some tourists due to in-flight entertainment and services despite journey length. Cristina compared a long-haul flight with a short-haul flight operated by a LCC, expressing how different she felt about the time en-route.

*"I mean, it depends on the travel. If I am coming back to Italy I am flying with cheap airlines. It's such a boring journey because there is nothing entertaining me a lot. But when you are on long flights you have many entertaining on board, so you can spend time doing whatever. It's quite engaging as well."* (Cristina)

Alfonso particularly valued the travel time with a full-service carrier considering the quality experiences of time, while Vincent linked alternative modes such as train or boat to high 'intrinsic value as a tourism experience' despite being slower (Larsen and Guiver 2013, p970).



*“I’m taking like a good flight, Emirates, Etihad, Qatar airways or Oman air. I’ve got nice food, perfect company, of course I would like to have a company with me. While going to the destination, I will have all the facilities that airline will provide that’s great.”* (Alfonso)

*“I like travelling itself. I don’t mind if it’s by train, car, plane or boat, I would enjoy any type of journey... For example, I also like travelling on a boat. You’re in the middle of the sea, islands and there’s nothing else around. You go miles and miles that is something we’re not used to it. I like it very much as sensational experiences.”* (Vincent)

In such cases, travel is viewed as an experience itself, which Vincent referred to as sensational experiences, which is at the core of the concept of slow travel (Dickinson et al. 2011). Indeed, some modes of transport are used for mixed purposes of mobility and experiences. For these study participants, the novelty of the travel experience or the surroundings draws attention, but instead it distracts from processing the passage of time whereby the duration of travel time is perceived differently from the actual clock time (Fayolle et al. 2014).

The perception of on-board experiences and the on-board environment is very subjective. While some participants claimed that they did not appreciate the travel time on a domestic coach journey in the UK, Julie stated how she enjoyed her en-route time.

*“Usually on the coach I gaze out on the window. I don’t know why but I can be relaxed, excited... I’m going on a journey and I know I’ve lived in this country for all my life but I’m still looking out the landscape because I like travel.”* (Julie)

Coach travel within the country generally does not incorporate on-board entertainment than any self-prepared activities such as reading, though options are becoming available, e.g. National Express is now using its own application that allows customers to access free entertainment as well as journey information (National Express Group 2016). Nevertheless, looking out from a coach window could entertain a person enhancing en-route experience. In that case, travel time is perceived and valued as a gift though individuals may be simply relaxing or self-reflecting (Jain and Lyons 2008). Thus, it is notable that travel modes were a key factor to influence the participants’

perceived time en-route as it facilitated the travel experiences that they gained and provided the environments (e.g. surroundings, atmosphere) with which they interacted.

#### **4.5.2. Emotional factors**

A common factor among study participants was that they showed emotional responses to travel time en-route when illustrating their travel experiences, as suggested by Nawijn et al. (2012). The felt intensity of tourist emotions differed depending on the holiday phases. Particularly relating to travel phases, most participants connected their positive feelings with the travel time to the destination while very mixed feelings were expressed in relation to the travel time from the destination. The positive emotions for the travel time to a destination are possibly connected with the anticipation of the actual on-site experience as tourists feel best in the middle of their holiday trip (Mitas et al. 2012). For these tourists the travel time was viewed as an integral part of their experience that they would rather enjoy. However, some associated their feelings about travel, specifically air travel, with 'discomfort' or 'anxiety'. This indicates that the mode of transport affects the travel experience and therefore the feelings and then the perception of travel time regardless of its direction, i.e. to or from a destination. These tourists desired their travel to be over quickly. This was again demonstrated when they were asked about what an ideal holiday would be like, as the following quote illustrates.

*“So even in between when flying back to Malaysia [from England], I don't know about other people, but I would always think that I'm going into turbulence or the plane is going to crash... That kind of stress could be eliminated if everything was cut much shorter. So, the stress of travelling and everything... My ideal holiday would be... shortest travel time possible” (Daisy)*

Some study participants viewed the returning travel time as useful to 'relax' and 'recover' from their holiday. Rosa explained how they were put in a 'reflexive' mood, feeling sad to realise the end of their holiday. Other participants showed mixed feelings about the travelling time back home, indicating that the perception of the journey to and from the destination was different. This was seemingly because of the explicit meaning of returning travel that they had to go back to the reality, or daily routine. Despite being the same distance of travel in most holiday cases (i.e. travelling back

home in the same way they travelled to the destination), these participants felt the time lasted longer or was boring.

*"I think it's more like punishment because you're going back. Yeah, I think I perceive the travelling to the destination as part of a holiday, but I think my holiday stops once I get on the transport back."* (May)

Recognition of the positive, negative or even neutral emotions is thus important to understand the accompanied perception of the travel time en-route.

#### **4.5.3. Additional time required for travelling en-route**

Participants were prompted to discuss their perception of travel time relating to their recent travel experiences. They viewed the time spent in waiting for travelling (e.g. connecting time between flights) through a different lens. Some considered the waiting time 'wasted' which could have been used instead for an activity at the destination. In this case, time is considered a significant cost (Jacobsen et al. 2018). Those participants, who thought the time was wasted, were less likely to utilise the time in doing something they would consider productive (e.g. work or study), which Jain and Lyons (2008) also address that perception of the waiting time associated with travel is closely related to the ways in which people 'equip', or spend, the time, e.g. by using mobile technologies, leisure reading or doing nothing.

However, other participants saw the waiting time as an added layer of 'opportunity' time which could benefit them having an extra experience during the time. The following participants viewed connecting time as part of valuable experience.

*"Connecting time [for the next flight] I love it especially when it's more than 4-5 hours. I love it."* (Alfonso)

*"It was quite nice [between train journeys] at that moment because I had an opportunity to go to a different city in the same country. I mean it wasn't long but at least I could see something."* (Ana)

Contrary to the findings of Lew and Mckercher (2006), connecting time between flights and trains or even between different modes of transport especially for long-haul routes was viewed fairly essential and important as it helped to increase certainty for the rest

of the travel that could reduce stress and anxiety. When it comes to longer connecting/stopping time, two participants felt it was some extra treats for the entire journey as they had opportunities to see around in the transit place. Connecting time could also help a family holiday trip to have a little break from a long-haul flight.

*“We’re planning to go to Australia and that’s a huge flight. For that, because of travel time with young children, we’re going to stop I think in China on the way there, and then Dubai on the way back. So, we’re going to break it up by two mini holidays on top and tail to make it feel a bit shorter.”* (Jessica)

Study participants showed mixed views on additional time required for travelling en-route such as connecting time between travels, while most could be categorised as either waste or an opportunity. The feelings and attitudes towards such time were found subjective and contextual, which is not clearly defined in a single term.

#### **4.6. Time use on-site**

The research explored tourists’ time use patterns on-site and found several common patterns. Desired experiences and the level of planning had a role in the patterns of time use at the destination. Accessibility and flexibility were found to be a key to movement at the destination where car use was considered beneficial to some participants in certain contexts.

##### **4.6.1. Tourist experiences and time use**

A number of participants believed it would be ideal to maximise their experiences and enjoyment through as many activities as possible within the limited time available, supporting the findings of Stein (2012).

*“When you often pay such a lot of money for a holiday, you want to feel like you’re getting most out of it”* (Jessica)

However, some participants felt time was always insufficient and therefore believed that it was crucial to determine how much time should be allocated to each activity as highlighted by García (2017). Apart from travel to and from a destination, tourists can allocate time to each activity at destinations considering the limited holiday time budget. The duration and sequence of activities that an individual tourist consumes can either

be planned or not before and/or during the trip, which determines time use patterns of the tourist, which is consistent with Becken and Wilson (2007). In this respect, the participants explained how they were sometimes encouraged to join organised tours.

*“...the reason I went on an organised tour like that I’d read so many things about Peru. And I realised that if I went on my own I could so easily miss out on something it might have been on five miles away whereas if you are gone on an organised tour you know that your tour guide, they know everything that is worth... So, for that tour I could fit it in the maximum things I was aware that we could do” (David)*

Chang (2007) also notes that a well guided tour can save tourists’ time and hassle by organising complicated arrangements and thus maximising the days available. Time use of this type of tourists reflects goal-fulfilment as a result of a goal-driven faster tourism consumption experience to relieve the feelings of time pressure (Oh et al. 2016). However, some tourists enjoy holiday planning. In some instances, tourists would choose to take part in a wide range of activities, while spending short time on each activity. Participants tended to show their preference for planning holidays on their own regardless of travel context such as socio-demographic characteristics and travel party.

*“Keep myself busy, organise things in advance to have a busy day and to enjoy as much as possible” (Vincent)*

*“... I have allocated the time and decided like how many hours from which destination to which, where to do and where to stop. Managing my time helped me to fulfil my, not a dream, but like idea of visiting all the destinations in that country. At the end of the trip, I managed to visit everything and see everything. And I was independent again because of my time planning” (Alfonso)*

Likewise, independent tourists can plan the details of their holiday at their own discretion and the decisions made in the planning process are associated with the absolute time budgets and the set of activities and attractions they wish to engage in during their stay (McKercher et al. 2006). Nevertheless, flexibility was found to be the key to holiday planning at the same time to a number of the participants, including those who had a child or children. That is, days on holiday were rather unstructured in

terms of time, which supports the findings of Dickinson et al. (2013a) indicating people experience a degree of time fluidity in tourism.

*"Yes, although I follow them, I'm quite flexible. It means I don't have certain times for lunch or dinner, and this is the main reason why I'm a solo traveller, you know."* (Muhammad)

*"I think when you're on a holiday, you just go with the flow a bit, remake plans and not be too hung up on being rigid because that's not really a holiday then, is it? I think you need to spend the time on holiday enjoying yourself, you know. It's good to make plans and do activities, but it's also good to be a bit flexible."* (Jessica)

*"I try to schedule all the time, what I have to visit and which day I have to visit and what. I try to put like schedule, but it is quite flexible. I mean I don't want to have the times to go to some places or others so..."* (Cristina)

Although these tourists had some plans to do at the destination with a set of objectives, they could change the plans during the day if needed, not only for better experiences but also for better use of time. The time use patterns of these tourists align between those of 'wanderers' and 'pre-planners' defined in McKercher et al. (2006, p649). 'Wanderers' are most flexible, having no firm plans but only a broad set of goals and decide what they are going to do as needed on-site, whereas 'pre-planners', the antithesis of the 'wanderers', have pre-set plans prior to departure and explore the destination with the purpose of ensuring all items on the list are ticked off (McKercher et al. 2006). However, the holiday planning spectrum may have transformed given technological improvements that provide dynamic and instant interactions. For instance, the nowness service, or real-time service and experience, within smart devices allows consumers to make decisions in real-time at a holiday destination (Buhalis and Sinarta 2019).

The interviews found that some tourists had a desire to slow down during a holiday despite a lack of time. Notwithstanding physical time constraints at the destination, the quality of time on holiday was considered important in certain cases, which was in fact for some tourists a holiday motivation. This view was most commonly expressed by the participants whose recent, most significant trip was with their extended family or

children. This supports the literature on family tourism whereby spending quality time together with the family (togetherness) is one of the key motives for tourism participation (Fountain et al. 2015; Li et al. 2017; Jamal et al. 2019). The participants made comments about holiday experiences, with a particular emphasis on slow-paced quality time spent on holiday 'together', in consistency with Minnaert et al. (2009).

*"It was the time hanging out together that we actually appreciated more... It was more about quality of the time."* (Daisy)

*"We like our holidays for our children to be learning experiences as well, so we want to make sure that we go places that... they learn something because every year we do take them out of school for a few days going on a holiday."* (Jessica)

*"Actually, the main purpose for me was taking my grandma, for her to see the Vatican City and see the pope... Obviously, anything wasn't planned like no one of us had plans where to go. That was the main purpose to go there. So, we've been there once."* (Ana)

The emphasis was on quality over quantity of experiences with respect to time use during their recent holidays. This is aligned with some key aspects of slow tourism (Dickinson et al. 2011) despite not having been explicitly stated that these participants necessarily sought a different form of tourism, or the concept of the experience economy (particularly, holiday experience), which strongly stresses the importance of experiencing tourist products and services (Stasiak 2013).

#### **4.6.2. Accessibility and flexibility on the move**

Accessibility<sup>5</sup>, defined in this study as "the fact of being able to be reached easily" (Cambridge Dictionary 2020), on holiday was valued by the participants. Study participants described accessibility as being independent and flexible, which provided opportunities to save time from searching directions and waiting for local public transport and to present flexibility on movement at destinations. In particular, the widespread use of cars at many destinations represents 'more immediate and efficient

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<sup>5</sup> This term is not used to describe accessibility in 'accessible tourism' (see its definition in for example Darcy and Buhalis 2010).

accessibility' (Schwanen and Lucas 2011, p.4) for tourists. The car offers speed, flexibility and convenience especially in remote areas with inadequate provision of public transport services, as also addressed by Le-Klähn and Hall (2015). As claimed by several participants, having a car meant holding control over how to use the limited time during holidays.

*"I went to Portugal and I rented a car... Managing my time helped me to fulfil my, not a dream, but like idea of visiting all the destinations in that country. At the end of the trip, I managed to visit everything and see everything. And I was independent again because of my time planning."* (Alfonso)

*"Because I do know based on my previous experiences, public transport costs a lot of time from my holiday. I prefer, instead of waiting for a bus, just to start the car and go to the other beach and see something else. I don't want to stay until 9 pm instead of that I want to stay until 12 pm, midnight and there's no bus... so it gives me a control of wherever I want to do with whoever I want until I want."* (Vincent)

Car use is also preferred in the case of a multi-destination trip. Vincent, for instance, travelled to Scotland from Bournemouth by car despite a long drive. He explained that this decision was made because of the convenience and flexible movement as well as affordability (when costs were split with the travel companions) as they were visiting different cities in Scotland during a week-long trip. Similarly, Andre eventually rented a private vehicle, scooter, for three days after his arrival at the destination for flexibility in movement.

This may not be applicable to certain places such as areas with high public transit (urban destinations) or access restrictions for private vehicles due to a variety of reasons such as a strategy to reduce GHG emissions, e.g. central London (Le-Klähn and Hall 2015). Public transport was a viable option for some tourists when travelling in such places because of it providing a visitor-friendly network.

*"I was just checking the roads where to go and actually using local buses and also the tube because it's quite good tube there for all these places."* (Ana)



Ana found convenience and flexibility in her movement within her destination, Rome. She also mentioned public transport as being more affordable as there was no extra fee such as parking charges if using a car. Besides, she felt public transport was more familiar as she commuted by bus in her daily routine. Her preference also highlighted the characteristics of the destination, i.e. Rome being an urban area. It appears that an enhancement of time use on-site does not always involve the use of car.

Interestingly, one participant mentioned that travel within the destination was more of personal experience and enjoyment, which they would be willing to take slowly, yet preferably by car, as the following quote:

*“I prefer to go to the town and see how people live to get into the culture and get experiences, instead of just flying through motorway with 200 kilometres... I would’ve chosen a slower way and the way how I’m going to drive through the mountains because they’re really interesting.”* (Alfonso)

This participant defined it as slow travel, where his general interest of holidays was around quality time and experience. However, this contradicts the definition of slow travel, by Dickinson and Lumsdon (2010). From these discrepancies in the discussion, Alfonso’s holiday travel indicates more of contribution to tourism’s energy consumption and GHG emissions when looked at as a whole trip, rather than low-impact slow travel.

Based on the limited time, activities and visits were planned by participants or their designated person/organisation (tour guide or operator). The plans were determined by the desired experiences at the destination, which was then found to help shape their time use patterns. The plans could be rather flexible, implying a degree of time fluidity. Accessibility and flexibility were discussed among participants that provided better experiences and time use to some extent in which the importance of car use was addressed, especially for long(er) trips and in remote areas.

#### **4.7. Travel context**

How people perceive and use time throughout a holiday trip seemingly depend on numerous factors of the travel context, as also suggested by Chavas et al. (1989) and Patel and D’Cruz (2018).

#### 4.7.1. Length of stay

Length of stay was found to influence perception of time en-route and patterns of time use on-site. For a short holiday, such as a weekend break, tourists preferred travelling the shortest distance possible because otherwise they would feel the travel time would be wasted. For a weekend city break to Amsterdam from Bournemouth, May chose air travel over other travel modes because she wanted to arrive at the destination with the fastest mode of transport available. This was to enjoy her limited holiday time budget on-site, indicating that time en-route affects the time available to spend on-site. As a result, she felt both actual (clock time) and perceived time en-route were very short:

*“Flight because it was the quickest way, otherwise you just need to go by ship or something to Amsterdam, so flight was cheap and really short.”* (May)

Nevertheless, she claimed that she would generally enjoy travel requiring longer time with the use of other modes than flight, e.g. train, but depending on the length of stay at the destination. Thus, it indicates how a tourist feels about time en-route when it comes to the consideration of the length of stay. Meanwhile, long travel time to the destination was described often as enjoyable by some study participants when it was associated with a long holiday, e.g. a two-week holiday. Longer travel indicates, but not always, a long-distance journey (actual travel distance) to a further away destination. As it takes longer to get to such a destination, tourists would tend to plan a longer stay perhaps to compensate the travel time:

*“...because the further away the country, the more time you want to spend there because you kind of think, ‘I might not have all the opportunities to go back there again’. So, for example, eight years ago we went to New Zealand and we said, ‘There’s no point in literally going to the other side of the world for 2 weeks’...”* (Julie)

When a person takes time off, which enables them to have a long holiday, the tourist may choose to travel the long distance to get to further afield. In such case, longer time spending en-route to get to such destination would be inevitable and the tourist would perceive that necessary and try to enjoy it. However, there is a question on what

mode of transport tourists take to make the long-distance journey shorter or even longer.

How much time an individual tourist has to spend at the destination determines how they use their time, as the following quote shows.

*“Um, I think I change my plans according to time I have. Let’s say I’m quite flexible, so if I know that I have a short period of time, I will change what I want to do according to the time, but in general, I think I want more time to spend in a place rather than... if I have to stay in a place for one day or two days, I already know that I won’t be enjoy it as much as I stay there for one week.”*  
(May)

The car may not be an essential for a very short trip. Those tourists who took short breaks such as May expressed their movement patterns being purposefully limited locally within the destination, supporting McKercher and Lau (2008). Unlike ‘short break escapers’ in McKercher and Lau (2008) who tend to prefer day trips outside of the main destination during the short break, the study participants preferred moving within the destination and therefore were likely to avoid the use of car, considering it unnecessary. Hence, an increase or reduction in the length of stay can be seen a determinant of how tourists perceive time en-route and their time use patterns on-site, including the necessity of car for movement.

#### **4.7.2. Trip purpose (type of holiday)**

It was found that the use of time on-site differs depending on the trip purpose, which supports the study of Woodside and Dubelaar (2002) and McKercher and Lau (2008) addressing that trip purposes clearly affect tourist behavioural patterns at the destination. For instance, tourists on a relaxing beach holiday tended to have less planned activities while those who were on a holiday with the purpose of exploration had a strict daily schedule with lists of activities to do and attractions to visit. David compared his previous holidays in terms of how he used time.

*“Each day we had specific things we were going to achieve every day. There was also the option to do various extra tours and that type of thing every single day or extra sightseeing every day. So that particular holiday I knew it was going*

*to be very busy, doing something every day... that was 15 days of doing something every single day. However, for example, when we went to Faro earlier in the year, that was purely meant to be a relaxing holiday and so there weren't any plans. The idea was just to relax. Yes, the idea was just going to sit on the beach just do nothing."* (David)

For the relaxing trip to Faro, David did not create any timed itinerary though he had searched for and selected 'things to do' in Faro prior to departure. Nevertheless, he did not feel obliged to achieve a single activity or pressured by the time constraints, but he rather went with the flow. Likewise, trip purposes determine the extent to which a tourist has planned activities at a destination and how flexible they would be with the plans.

Despite its major advantages, i.e. flexibility in terms of time use, car use was seemingly holiday specific, i.e. adjustment depending on the holiday, to some tourists in terms of preference. For instance, Rosa mentioned "this package holiday is really good" whereby her preference for all-inclusive trips was shown because most travels and activities were prearranged with a few options available on site aiming optimal time use. May showed her preference for driving within a destination but she did not require one for a short weekend break within the capital city whereby all desired activities and attractions were within walking distance except one which was reached easily by public transport. Accordingly, she could use her limited time effectively achieving what she desired to do. Thus, the main factors affecting car use on holidays include trip purpose (i.e. less car dependent for all-inclusive/package tours, short city breaks; car dependent for independent tours, holidays to remote destinations).

#### **4.7.3. Travel party**

Travelling with young children or elderly companions plays an important role in the perception of time en-route and the use of time on-site. Having a person who needed special assistance for a holiday was found to be influential in the processing of time. Betty thought travelling with a small baby required numerous breaks on the way, which made her perceive time on en-route as longer than the actual time. While she preferred a short-distance trip, if the destination could not be reached within two hours, the car

would be dismissed because she could not stop always to give attention to her child. Then, she would choose alternatives such as train.

*“If we had gone Wales or Scotland, you know, that would’ve been an entire day travelling, and I have never taken a journey that long ever.”* (Betty)

In this regard, Jessica explained how she and her husband inevitably set temporal and spatial boundaries for a holiday to a certain limit, so their children could cope with the travel.

*“When the girls were smaller, we [my husband and I] did actually look at locations where flights were no more than these many hours, so we had like a bit of parameter of the world of where we could fly to because my husband said, ‘I don’t think they can cope with a flight more than three hours’, so that limited our destinations as parents and I think a lot of families do that.”* (Jessica)

When it comes to time use on-site, using a car was much preferred by those who travelled with young children, as also noted by Böhler et al. (2006). Despite other reasons such as convenience, the effective time management at the destination was why car was preferably used compared to other modes, e.g. public transport, by such tourists. Muhammad who had a small child explained that having a car within a destination would provide him with more flexibility and make him think of having more time for other activities.

*“I will be more flexible with time and have sufficient time. I think if I had a family, I would rent a car than go by trains [connecting different places within the destination], especially if I have children, you know...”* (Muhammad)

Ana claimed that during her ten-day trip in Rome with her grandmother nothing was planned but to visit the Vatican City. Due to the grandmother’s health condition, their spatial movement patterns were limited within the destination and thus the use of time was much slow paced. However, she, in another holiday with her friend, in their 20s, did as much as possible within the destination considering the limited time budget.

*“I was once with my friends on one trip, on a holiday in Romania. That moment we didn’t plan anything, but it was like we want to see as much as we can. We*

*also were under a little bit of pressure because we preferred to wake up very early to go and to visit. It's like obviously if you feel like you have to do stuff you do more.”* (Ana)

Hence, it is notable to distinguish that the experiences of travel time and the spatial-temporal behavioural patterns of tourists are restricted and confined when they travel with a young child/children or old person, compared to other tourists, e.g. travelling as a solo tourist, a young couple without a child.

#### **4.7.4. Repeat visit or first visit**

The use of time at a destination can differ depending on whether or not it is the first visit to the destination. David noted that his repeat visits to Madeira, Portugal, made him feel rather relaxed compared to his first visit that was very packed with many activities. This is consistent with the findings of Oppermann (1997), Lehto et al. (2004) and Li et al. (2008) that indicate tourists change their behavioural patterns associated with activity and attraction participation, invoking different demands in their repeat visit. In his repeat visit, David rather drove around the different parts of the destination without even entering the most tourist area, i.e. the city centre, of the island.

*“There was nothing we said we had to do. All I just said to Tomas was I'd like to see different parts of the island that I hadn't previously seen. There was nothing that was on a pre-booked or pre-planned agenda.”* (David)

However, like David, Julie also compared her two trips to India. Her first trip was planned very specifically beforehand in order to see as many places and sites possible, *“so none of that time is wasted”* (Julie). However, in her second trip to the same destination, she was more flexible with plans and time spending. Though she was engaged in fewer activities, she did not consider the holiday time wasted. In this sense, the use of time seems also associated with the willingness or possibility of returning to the destination. If a tourist thinks they will not be able to come back to the destination after the first visit, they may allocate their limited time more carefully to encompass all desired activities. Some participants stated that they could revisit the destination any time they wanted and therefore rushing to maximise their experience by doing and seeing was not necessary.

*“I think every holiday there’s always something you’re going to miss because of time. But I just have to come back another day and visit again and go and do that.” (Julie)*

That is, the probability of a return trip would dominate the time use patterns of tourists at a destination. As knowing not to return to the same destination, tourists are likely to “*make the most out of it*” (Jessica), i.e. enjoy as much as they can in the first/last visit to the destination.

#### **4.8. The potential TRE**

Various technological improvements that help to save time on holiday, both en-route and on-site, were seen by study participants as valuable in terms of saving time and making a trip more convenient. In particular, when asked about having faster travel options to a destination, reflecting on their recent holidays, almost all study participants believed that faster travel would have potentially positive impacts on their holiday experiences with the time paradigm of ‘the faster, the better’, especially for those who viewed travel as a waste of time. Participants believed their holiday experiences would change in several aspects, which were perceived positively from their perspective, indicating the potential TRE, as per below.

##### **4.8.1. Travelling further**

Time savings en-route would enable tourists to travel further afield where they would not have gone without having faster modes of transport due to time constraints. However, it was acknowledged that a set of characteristics of tourists and tourism services/products would play a key role in determining the destination choice alongside the time savings. The characteristics of tourists include their socio-demographic profile, travel companions, preference on types of holiday and so on. Tourism services/products refer to what a destination has to offer to tourists such as attractions and activities.

*“If there was that kind of technology, I would love to go further. Um, it’s absolutely stunning tropical places like the Maldives. Places like that just take so long to get to, but if they had like that kind of advanced technology where you can travel faster, you know, I’d like to go much further than Europe.” (Rosa)*

*“It probably would mean we’d consider going further. I mean it takes us an entire day to get to New Zealand. Imagine getting to New Zealand in the time it now takes to get to India that would be good.” (Julie)*

That is, time savings from technological improvements can result in a release for tourists from temporal and spatial constraints (Dickinson and Peeters 2014). These patterns are relevant when tourists choose a destination depending on distance in relation to travel and time availability. Particularly when travelling with children, this was expressed as a whole change of holiday experiences, which could expand the *“temporal and spatial boundaries”* for a holiday trip (Jessica).

Meanwhile, it did not seem so relevant for those who chose a recent holiday destination due to the place itself as they planned to visit regardless of time it could take to reach it. This was because the participants wanted new experiences in that specific destination. In other words, it was clear that, for either first time or repeat visitation, these participants would have gone to the same destination as planned anyway despite the intervention of time-saving travel technologies. However, they also noted the opportunities to go to further afield destinations for future trips.

#### **4.8.2. More frequent holiday travel**

Time savings could provide opportunities for more frequent trips as the following quote illustrates:

*“I think actually you’d be inclined to do more short breaks as well because it’s not taking too much out of your time. So, you could just go for a weekend if you wanted to because travel time is really short.” (Rosa)*

Muhammad added another opinion, saying he could take advantage of a time-saving transport, referred to a ‘bullet train’, for more frequent short trips within the country from Bournemouth to Northern England, which he had previously considered not possible because of the long travel journey. These two participants claimed to have pressure of time and work from busy schedules in their daily life in which demand for time-efficient short breaks seemed to be accountable as they could get away from such pressure even at short notice and with no preparation. The potential demand for more frequent shorter trips (i.e. shorter length of stay) demonstrates the recent trend



in tourist travel patterns (Gössling et al. 2018), which has a close relevance for tourism's GHG emissions. For instance, people can benefit from the on-going HS2 rail networks that will increase connectivity and save travel time; however, there has been a debate on the issue of the potential for increasing GHG emissions (Barkham 2020).

#### **4.8.3. Substitution for more energy-intensive transport mode**

Unless travel itself serves as a unique experience such as going on a cruise ship tour, all participants would choose a faster travel option to get to a destination, if available. This, however, suggests no correlation with how they perceive travelling time to/from destination (e.g. enjoyable or wasted). For instance, several study participants generally enjoy travelling by other modes than flying, but they saw a faster travel option by air as a great opportunity to cut down the travel time and spend more time at the destination. In fact, none of the study participants raised concerns over the potentially increased environmental impacts of the faster travel option (see the Section 4.3).

#### **4.8.4. Longer stay and extra activities on-site**

Tourists are likely to lengthen their holiday. A number of study participants expressed that they would alter their length of stay to utilise the saved time at the destination by choosing a faster travel option, which supports Boto-García et al. (2019) underlining the relationship between the length of stay and the mode of transport. That is, time savings en-route were commonly perceived by the participants as an opportunity to extend their holiday by giving more scope to arrive at a destination earlier, e.g. then, start to explore the place earlier, and leave the place later, i.e. maximise the time spent at the destination.

Length of stay is closely related to the patterns of tourist flows in terms of time. Longer stay meant increased holiday time budget to plan for more activities although study participants did not necessarily define what specific activities they could undertake. Instead, when asked about additional activities they would like to engage in if they had more time reflecting on their recent holiday experiences, participants mostly provided specific examples. The examples were particularly related to whether they had accomplished all desired activities or not during the holiday:

*“There was a Palma trip, so to the city where we went and that was in the evening and it’s meant to be stunning at night time. We had to pick between doing the Son Amar show or the Palma night one, so we picked Son Amar, and we picked Palma during the day. If we had more time, we would’ve gone in the evening as well just because it was just totally different experience and also at night time... We would have done more day trips out on the boat and excursions on the boat as well, so boats just drop people off quite few places and we did only one of them and we would’ve done that more times. Also, we can hire things as well. Um, we didn’t do that, you know you get loads before you go out and end up coming back with half of them.” (Rosa)*

*“... our last step was in Glasgow. We arrived in Glasgow in the late afternoon and we left early in the morning. So, we didn’t have time to visit Glasgow basically because of lack of time. So, if we would have had more time, even if we would have arrived in Glasgow earlier in the day or left later in the afternoon or one more day, I would have had more time in Glasgow. We just stayed in the hotel and we didn’t go out.” (Vincent)*

The length of stay at a destination and the length and speed of travel to a destination have different impacts on changes of holiday activities (Gössling et al. 2018). A short or weekend trip generally tends to involve relatively short journeys whereby time savings from technological improvements would not have substantial impacts in terms of having more time at destination for extra activities.

*“To be honest, going to Amsterdam was rather to be a shorter trip anyway, so I don’t think things would have changed massively because in the end I only had three days, so just a couple of more hours wouldn’t have changed much.” (May)*

This view may come from the fact that May chose the fastest mode (flight) available for the trip and it was only less than an hour that she thought was a short enough journey. Thus, she did not see the benefit of further reducing the travel time in this case. Nevertheless, May saw the benefits of time savings in a general sense and envisioned the opportunities to travel further afield instead. Comparably, it could be

argued that time savings en-route for longer travel which is part of a longer holiday (more than three days) could have more scope for doing extra activities.

For instance, a study participant who went on a multi-locational trip would seek to visit nearby counties:

*“If I had more time I could have visited other places, not only staying in Laos and Thailand, but also Cambodia and Vietnam.”* (Cristina)

The longer the length of stay is, the more activities tourists will take part in (Lau and McKercher 2007). This demonstrates the impacts of time savings on changes in tourists' activity patterns. These findings have also important implications for energy and GHG emission intensity per trip (Filimonau et al. 2013; Sun and Lin 2018).

Faster travel technology would provide most participants with extra values by saving time and thus by offering opportunities for changes of their holiday choices. Most participants claimed they would benefit from the time savings and change their behaviour in relation to at least a single phase of a holiday trip (e.g. in travelling or in activity participation). The types of behavioural changes, potential TREs, which have clearly emerged from the interviews were:

- Travelling further afield;
- More frequent holiday travel;
- Substitution for a more energy-intensive transport mode;
- Longer stay and extra activities on-site.

#### **4.8.5. Factors influencing the potential TRE**

Several fundamental factors influence the participants when given an option to choose a faster transport mode. These factors may encourage them to take the opportunity or hinder them from enjoying the benefits of such opportunity.

##### **1) The cost effect**

Not surprisingly, interviews suggest that money is a key element alongside time to drive the TRE. This demonstrates that different activity choices, temporal patterns of a trip and the perception of time allocation of tourists are determined by monetary

budget as well as holiday time budget, supporting Prideaux (2000); Jäckel and Wollscheid (2007) and Golembiski and Niezgoda (2012). These patterns were particularly displayed by participants in full-time education, who are likely to be 'money poor'. This indicates the general sense of financial constraints among students, which can also be a factor that limits student tourists' activities. Student participants discussed their concerns over the potential affordability of a faster transport technology despite preferring a faster travel.

*"It also depends on how affordable this technology would because even if it's quicker, but it costs double... I think money-wise at the moment I would have to go with normal transportations instead because that's the only thing I can afford."* (May)

*"It also depends on the money. Let's say, there's... a taxi or private driver that can drive me to Bath within one hour but he's going to charge me £150 per person, I won't still pay the amount because I can still afford the time to waste in the train... If the price doesn't change much, of course I will take the shorter one."* (Daisy)

Along with student tourists, families may be on tight budgets, which would possibly influence the uptake of a faster transport technology. For example, Jessica expressed her mixed feelings of having extra time at the destination because extra time meant not only more time for more activities but also more money. Besides, when it comes to extra activities at a destination, study participants expressed similar financial constraints.

*"Probably I would have travelled to a new city if I had [from the time savings], but it depends on the budget as I told you, you know, you come with a certain budget to spend... if you see it comes to the limit of your budget, there's nothing you can do."* (Muhammad)

*"We would go to different places. Maybe I would see more... places there or I would do more attractions there or well... it depends. If would have been in money, I would like to spend more money on something else. If the travel was cheaper... I would just be sleeping more."* (Ana)

In these cases, although there is a desire for extra activities, with limited monetary budgets tourists would rather engage in low-cost activities such as beach visits, which may have less environmental implications.

## **2) Time coordination**

Although time savings en-route can open up the opportunities to engage in more activities on-site, one of the major concerns relating to this is in the availability of services to facilitate tourism, such as the departure/arrival times of travel, check-in times for a hotel or opening hours of a museum.

*“There’s so many factors on this because it depends on what time your flight is and that makes differences on what time you land because if you land in the middle of the night that’s going to make no difference because you’d still lost the day anyway because you can’t do anything.” (Jessica)*

*“There would be nothing more frustrating than arriving 3 hours earlier only to realise that your hotel was not ready or the theme park was not open, and there’s time because if you’re in an unfamiliar situation, then you would struggle to know what to do... that would be detrimental because then you would lose the benefit of arriving early. Then you would have to fill it with non-fun stuff.” (Betty)*

As addressed by Dickinson et al. (2013a), tourism is often structured by fixed schedules which impact their time management at a destination. This demonstrates, no matter how fast tourists could reach a destination, availability of services play one of the key roles in determining how the saved time could be utilised for better tourist experience.

## **3) Physical and psychological wellbeing**

Wellbeing benefits were highlighted for choosing a faster travel option by some participants. The following is illustrative of the reaction to technological improvements in travel speed, which is in general associated with medium- and long-haul routes.

*“To be honest, I wouldn’t feel as jetlag as I felt. So, it would have affected the following days in a positive way because I wouldn’t have been so tired. And probably enjoying more time exploring like doing something more.” (Cristina)*

*“The travelling makes the feeling of travel fatigue... it would make you feel better, wouldn’t it? Even when you got to the other end rather than ‘Oh my god, I’ve been flying for hours’, so like it was 4 hours, ‘Oh, here now. Let’s go. What we are going to do?’ There might be more energy for stuff.” (Julie)*

*“Yeah, because the longer it takes you to travel, the more recovery time you need. If you’ve got a really long way to travel, you’d probably be more inclined to get there closer to the evening so you’re just having dinner and then bed, whereas if it’s short amount of time, small amount of recovery, then you can make most of the day because you wouldn’t be too tired to do that.” (Rosa)*

Physical and psychological wellbeing can be an important factor determining the temporal patterns of tourists at a destination (Stankov et al. 2020). In this sense, such enhanced conditions thanks to the faster travel were considered by many tourists to help improve the participants’ holiday experiences and enjoyment determining the level of engagement with different types of activities at destination.

#### **4.9. Summary**

Tourists have high level of awareness of environmental impacts of tourism and present pro-environmental attitudes in the context of home and away. However, their knowledge and attitudes do not translate into pro-environmental travel behaviour, particularly air travel behaviour. Tourists tend to justify their flying behaviour by externalising the responsibility.

The key factors influencing this perception relate to unfamiliarity, usual demands, emotions/time awareness and lack of time pressure, which reflects tourists stepping out into the liminal stage for the liminoid experiences of time. Time passage on holiday is perceived differently depending on whether tourists gain new experiences during the holiday. It also is associated with their daily duties. Most tourists perceive time going faster during a holiday as they do not have usual demands such as work or parenting. Holidaying links to generally positive emotions, entailing the lack of time

awareness, whereby tourists feel time is speeding up. The lack of time pressure means having autonomous control over their own time, which explains that tourists perceive their holiday time passing differently from it in their usual days.

The experiences and environments (e.g. surroundings, ambience) of travel to/from a destination plays a significant role in the perception. Tourists are likely to engage their emotions (mostly categorised as either positive or negative) with travel time, showing often different perspectives of the travel time to a destination and from the destination individually. Mixed views are presented by tourists regarding additional time required for travelling en-route such as waiting/connecting time between travels. The views can be divided into two subsets of either time being wasted or given as an opportunity. The feelings and attitudes towards travel time are subjective and contextual, which is not clearly defined in a single term.

Time use on-site is closely linked to the experiences at the destination, whereby tourists either outsource their holiday planning (guided tour) or do it on their own. Holiday plans not only represent better experiences, but also better use of time. Depending on what they sought in their trip, tourists seem to 'go with the flow' to some extent unless all plans are set for an organised tour. In this sense, accessibility and flexibility are the key for better experiences and time use in which the importance of car use is addressed especially for long(er) trips and remote areas.

Perception and use of time throughout a holiday trip (how tourists perceive time en-route and their time use patterns on-site) are influenced by travel context, which incorporates several key elements. These elements include the length of stay, trip purpose, travel party and whether it is a repeat or first visit. Such elements may change on each holiday; however, some preferences (e.g. general preference for short breaks) or commitments (e.g. travel with children) may stay unaffected, playing a role in sustaining consistent time perception and time use patterns to some extent.

A variety of technological improvements that help to save time on holiday, both en-route and on-site, are considered valuable in terms of saving time and convenience among study participants. Tourists believe that faster travel would have potentially positive impacts on their holiday experiences with the time paradigm of 'the faster, the better'. This is particularly applied to those who regard en-route travel as a waste of

time. Holiday experiences and behaviour of tourists would change in several aspects, indicating the potential TRE: travelling further afield; more frequent holiday travel; substitution for a more energy-intensive transport mode; longer stay; and extra activities on-site. Cost, time coordination and physical and psychological wellbeing emerged as factors for the choice of a faster travel technology.

Figure 4.3 summarises the main findings of the qualitative phase of this study. The variables under influential factors (availability, psychological values and patterns of time use) influence, individually or simultaneously the scope for diverse forms of potential TREs to occur.

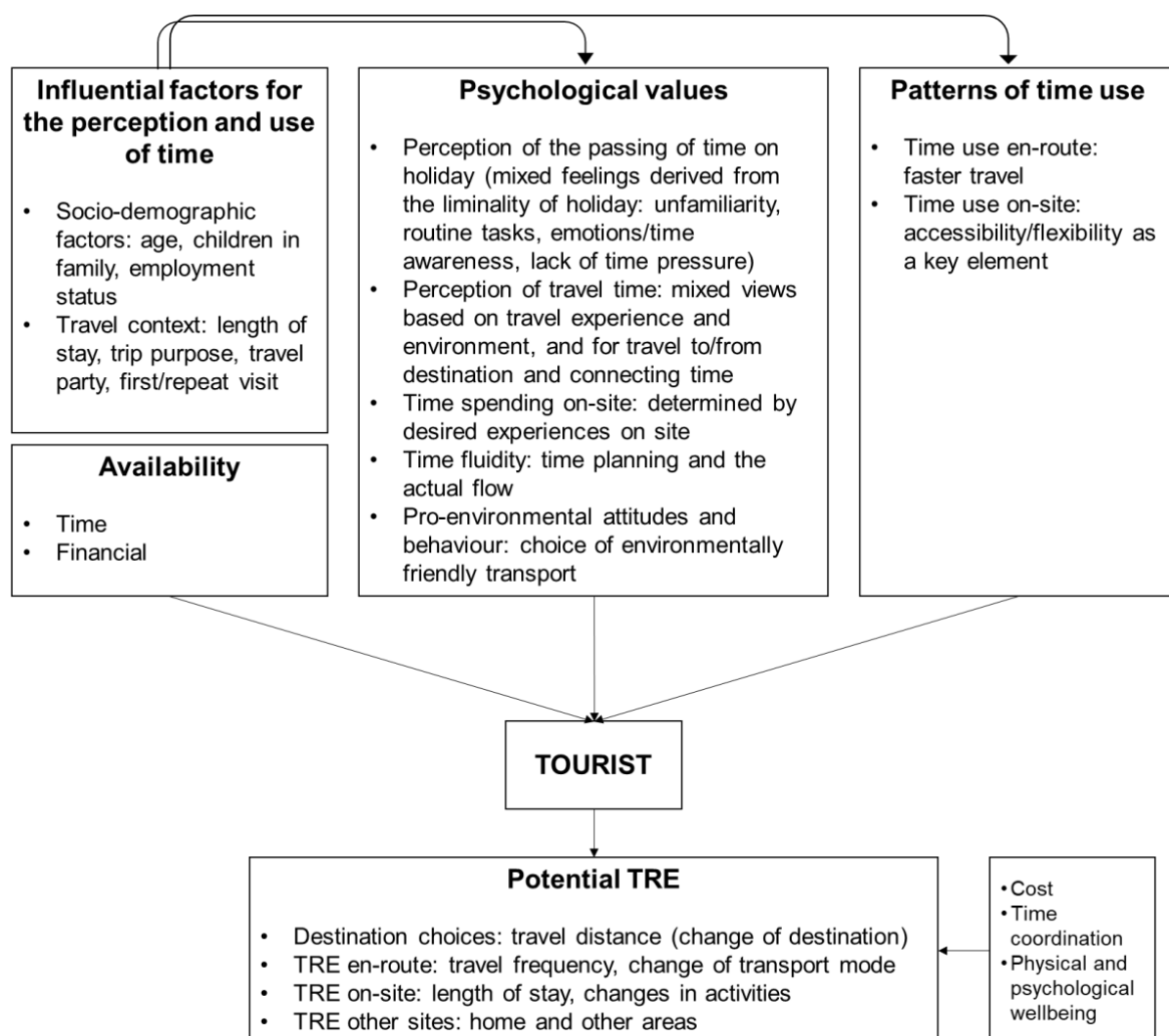


Figure 4.3 Conceptual framework outlining the qualitative research key findings



Figure 4.3 provides the basis for the design of the questionnaire survey for the second phase of the research. Each variable and the relevant quotes elaborated by study participants (i.e. actual words and phrases from people) as well as the literature reviewed in the earlier chapter were the sources to form the survey measures (see Appendix 6 for detailed presentation of the associations between qualitative findings in Phase II questionnaire design).

## **Chapter 5. Analysis and findings of Phase II – quantitative research**

### **5.1. Introduction**

Phase I of the study was concerned with examination of the time dimension in the tourism context to inform a questionnaire survey development in Phase II. This second phase of the research was to explore the impacts of time savings on tourist behaviour and the potential TREs aiming to accomplish the research objectives:

- 2) To conceptualise the potential RE, integrating the TRE, in tourism by categorising its key dimensions and drivers of the RE
- 6) To investigate the extent to which time savings achieved by the availability of more time-efficient transport affect tourists' behavioural patterns, or the occurrence of the TRE
- 7) To identify the key forms of the TRE that help provide empirical evidence of the applicability of the (T)RE concepts in the tourism context

The questionnaire survey was conducted to achieve generalisability of results from the data gathered to aid in the refinement of the conceptual framework developed in the literature review (see Figure 2.2 in Chapter 2). The analysis begins with descriptive data on respondents' characteristics and their holiday preferences. Following this, the results of various statistical analyses are presented along with the analysis procedures. A series of analyses and findings on the items measuring the potential TREs are shown in comparison with the key factors identified, including the socio-demographic variables, holiday preferences, availability (constraints), psychological values and time use patterns. The findings relating to the key forms of the TREs are displayed in terms of destination choices, en-route and on-site. The interpretation of the findings is discussed throughout the chapter. The chapter concludes with a section that summarises the main findings of the quantitative data analysis.

## 5.2. Respondents' profile and holiday preferences

In total, 404 usable questionnaires were collected, and the analysis was conducted on this sample. The respondents' socio-demographic characteristics were broadly consistent with those of the UK's population in terms of age, gender and income distribution (ONS 2016; ONS 2020b). Besides, the respondents' holiday preferences and views on different aspects regarding holiday trips were analysed against the relevant national data and their socio-demographic features.

### 5.2.1. Respondent profile

The sample represents the population of the UK, compared to the UK's 2011 Census (Table 5.1). Slightly less than one third of the sample is aged 58 and above and the rest was made up by the other age groups with a similar proportion in each age group, which represents the UK's population. 88.9% of the respondents are British and the rest includes Irish (1.5%), Polish (1%), French (0.7%) and Portuguese (0.7%). 78.2% of respondents (316) are White ethnic.

Table 5.1 Respondent profile

|                                                                          | Sample | UK population          |
|--------------------------------------------------------------------------|--------|------------------------|
| Age                                                                      |        | UK Census <sup>a</sup> |
| 18-27                                                                    | 17.1%  | 17.2%                  |
| 28-37                                                                    | 18.1%  | 16.9%                  |
| 38-47                                                                    | 18.6%  | 18.6%                  |
| 48-57                                                                    | 16.3%  | 16.2%                  |
| 58 and above                                                             | 30.0%  | 31.2%                  |
| Gender                                                                   |        | UK Census <sup>a</sup> |
| Female                                                                   | 51.0%  | 51.0%                  |
| Male                                                                     | 49.0%  | 49.0%                  |
| Employment status                                                        |        | UK data <sup>b</sup>   |
| Employed (employee and self-employed combined, both full- and part-time) | 65.8%  | 76.6%                  |
| Unemployed                                                               | 5.7%   | 4.0%                   |
| Student                                                                  | 6.2%   | 5.3%                   |
| Retired                                                                  | 14.1%  | 2.8%                   |
| Ethnicity                                                                |        | UK Census <sup>a</sup> |
| White                                                                    | 78.2%  | 85.5%                  |
| Asian                                                                    | 8.7%   | 7.8%                   |
| Black                                                                    | 5.0%   | 3.5%                   |

|       |      |      |
|-------|------|------|
| Mixed | 4.0% | 2.3% |
| Other | 3.0% | 1.0% |

a. Most recent UK Census 2011 by ONS (ONS 2016)

b. UK data (ONS 2020a): Data collected from December 2019 to February 2020 (quarterly Labour Force Survey). Sample size: Approx. 40,000 responding UK households per quarter. The percentages in the Table are calculated based on this sample size with the numbers given for each criterion.

This current employment status of the sample is not particularly comparable with the national figure available due to the different methodology used and the purpose established (e.g. differences in the age range of respondents, types of employment, study subjects between the national survey and the current research)<sup>6</sup>. However, the employment status of the sample was partially, where applicable, compared with the corresponding national employment status data collected in the time the survey was conducted. The figures were fairly similar while the rate of the retired group in the sample was much higher, but this would be because of the limited age range of the UK data (individuals aged 16 to 64 years).

### 5.2.2. Current employment status and household income

Similar options in the answer were logically grouped together (full-time and part-time committed) for simplification and convenience of data analysis, based on their commitment to the current work in terms of time. This is because the current employment status was asked to see how much discretionary time the respondents would have. Figure 5.1 shows re-categorised employment status against household income of respondents.

The UK's median household income represents the middle of the income distribution and reflects the living standard of a 'typical' household in terms of income according to ONS (2020b), which is in line with the median value of household income of the sample (Figure 5.1 for the proportion of each income group). Those who did not have any income from work, i.e. unemployed or unable to work, were also included in the income groups.

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<sup>6</sup> For a detailed overview of the quarterly Labour Force Survey, see <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/methodologies/labourforcesurveyuserguidance> which includes information on the survey background and methodology.

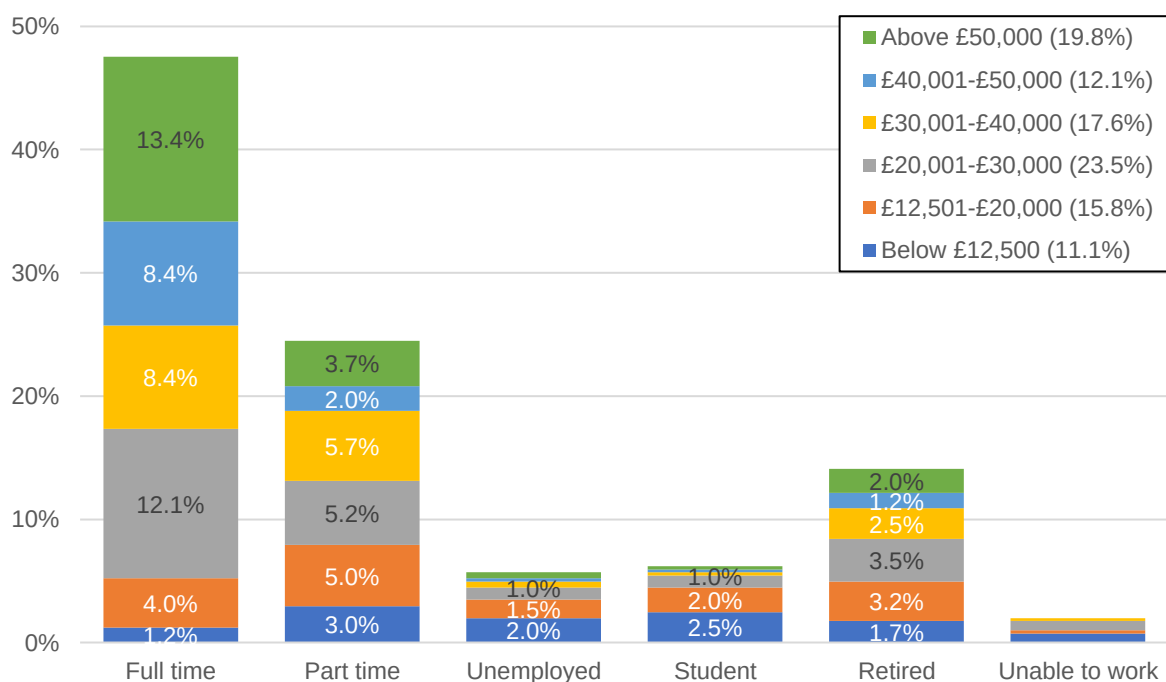


Figure 5.1 Current employment status and household income level

### 5.2.3. Having children in the household

#### 1) Age of children

Approximately 40% (N=162) of the total respondents had children in their household. Table 5.2 presents the age of children, which was categorised as: pre-school, school-age and adult. Considering the national figure of the age of the population (ONS 2019b), the biggest age groups under 18 years old are between 5 and 7 years old, which is fairly consistent with the study's result.

Table 5.2 Age of children

| Between 162 respondents | Age of children                                            | % of 162 respondents <sup>a</sup> |
|-------------------------|------------------------------------------------------------|-----------------------------------|
| Age of children         | Pre-school child/children in my household (0-4 years old)  | 28.4%                             |
|                         | School-age child/children in my household (5-17 years old) | 54.9%                             |
|                         | Adult child/children in my household (over 18 years old)   | 40.1%                             |

a. The percentage of age of children is against the number of respondents who said yes to having children in their household. The question was multiple responded, where applicable.

## 2) Children and holiday frequency

Respondents who had children of all ages were additionally asked whether having children restricted the frequency of their travel for holiday, i.e. to investigate if they make fewer holiday(s) than before they had children. Overall, these respondents showed slight agreement to the idea (Mean=3.26). As shown in Table 5.3, people with children under 18 years old were more likely to agree and strongly agree. In other words, not surprisingly, people with children over 18 years old agreed less than those who have younger children. A Mann-Whitney U test was performed to compare differences between people with and without children demonstrated that presence of children (at any age). The test outcomes demonstrated that presence of children did not significantly restrict travel frequency for holiday ( $U=1553.500$ ,  $z=0.115$ ,  $p>0.05$ ).

Table 5.3 Having children and its impact on the frequency of travel for holiday

| Age of children                                                   | Strongly disagree <sup>a</sup> | Disagree | Neutral | Agree | Strongly agree | Mean |
|-------------------------------------------------------------------|--------------------------------|----------|---------|-------|----------------|------|
| Pre-school child/children in my household (0-4 years old) (N=46)  | 4.3%                           | 19.6%    | 4.3%    | 41.3% | 30.4%          | 3.74 |
| School-age child/children in my household (5-17 years old) (N=88) | 4.5%                           | 18.2%    | 6.8%    | 43.2% | 27.3%          | 3.66 |
| Adult child/children in my household (over 18 years old) (N=57)   | 38.6%                          | 14.0%    | 12.3%   | 24.6% | 10.5%          | 2.23 |

a. Strongly Disagree=1 and Strongly Agree=5

## 3) Children and travel distance

Respondents with children were also asked whether having children restricted the distance they choose to travel for holiday, i.e. to investigate if they choose a holiday destination which is closer to home after having children. Overall, there was slight disagreement (Mean=2.95). Looking more closely, most of the respondents who had pre-school children agreed (agree and strongly agree) that having children has limited their destination choices in terms of the distance to travel, while over half of the respondents with school-age children responded to the statement with agreement (Table 5.4), which supports the qualitative study findings of Khoo-Lattimore et al.

(2018). Parents with adult children, however, disagreed with the statement than those with younger children, meaning that having older children did not stop them from choosing to travel further away. A Mann-Whitney U test was performed to compare differences between people with and without children demonstrated that presence of children (at any age). The results demonstrated that presence of children did not significantly restrict travel distance for holiday ( $U=1836.500$ ,  $z=1.491$ ,  $p>0.05$ ).

Table 5.4 Having children and its impact on the travel distance for holiday

| Age of children                                                   | Strongly disagree <sup>a</sup> | Disagree | Neutral | Agree | Strongly agree | Mean |
|-------------------------------------------------------------------|--------------------------------|----------|---------|-------|----------------|------|
| Pre-school child/children in my household (0-4 years old) (N=46)  | 4.3%                           | 21.7%    | 6.5%    | 39.1% | 28.3%          | 3.65 |
| School-age child/children in my household (5-17 years old) (N=88) | 9.1%                           | 25.0%    | 11.4%   | 39.8% | 14.8%          | 3.22 |
| Adult child/children in my household (over 18 years old) (N=57)   | 43.9%                          | 19.3%    | 21.1%   | 14.0% | 1.8%           | 1.85 |

a. Strongly Disagree=1 and Strongly Agree=5

#### 5.2.4. Time availability

##### 1) Time availability of respondents

Most respondents (73.3%) agreed (agree and strongly agree) that they had enough time for holiday travel in general (Table 5.5). Many respondents (76.2%) viewed they had enough time to manage everything they wanted when on holiday, which reflects the gradually increasing level of global mobility of people for tourism. There were mixed views on the statement 'With limited vacation time, I prefer taking frequent short breaks in a year, instead of a single, long holiday' with 39.1% of agreement and 35.2% of disagreement.

Table 5.5 Time availability of respondents

|                                                                                                                 | <b>Strongly Disagree<sup>a</sup></b> | <b>Disagree</b> | <b>Neutral</b> | <b>Agree</b> | <b>Strongly Agree</b> | <b>Mean</b> |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------|----------------|--------------|-----------------------|-------------|
| In general, I have enough free time for holiday travel.                                                         | 3.5%                                 | 13.1%           | 10.1%          | 48.5%        | 24.8%                 | 3.78        |
| When on holiday, I normally have enough time to manage everything I want.                                       | 1.7%                                 | 10.2%           | 11.9%          | 57.9%        | 18.3%                 | 3.81        |
| With limited vacation time, I prefer taking frequent short breaks in a year, instead of a single, long holiday. | 7.7%                                 | 27.5%           | 25.7%          | 29.2%        | 9.9%                  | 3.06        |

a. Strongly Disagree=1 and Strongly Agree=5

## 2) Time availability and employment status

Most retired and unemployed respondents agreed that they had enough free time for holiday travel in general (Table 5.6), while student and full-time work committed respondents least agreed with this idea. Nearly 95% of retired respondents claimed that they normally had enough time to manage everything they wanted on holiday whereas student respondents showed more disagreement (20%) to this than any other employment status groups. Over half of student respondents preferred taking frequent short breaks in a year to having a single, long holiday. In contrast, the retired group of respondents was more likely to disagree with this statement (38.6% of disagreement). According to Lasada et al. (2016), as a person gets older, so does the perceived time availability for travel for holiday due to the reduced workloads and burdens for family. The results for students are contrary to Thrane's (2016) suggestion that students typically have more discretionary time and fewer obligations relating to family or career, and thus they are more likely to take longer holidays than senior or full-time work committed tourists do. This may be explained by that perceived availability of time for holiday is not consistent with actual time available for holiday for certain tourists due to its subjective nature.



Table 5.6 Time availability and current employment status

|                                                                                                                 | Full time                  | Part time | Unemployed | Student | Retired |
|-----------------------------------------------------------------------------------------------------------------|----------------------------|-----------|------------|---------|---------|
|                                                                                                                 | Agreement (%) <sup>a</sup> |           |            |         |         |
| In general, I have enough free time for holiday travel.                                                         | 69.3%                      | 70.7%     | 87.0%      | 60.0%   | 93.0%   |
| When on holiday, I normally have enough time to manage everything I want.                                       | 74.5%                      | 72.7%     | 82.6%      | 64.0%   | 94.7%   |
| With limited vacation time, I prefer taking frequent short breaks in a year, instead of a single, long holiday. | 41.1%                      | 37.4%     | 47.8%      | 52.0%   | 29.8%   |

a. Agreement: Strongly Agree and Agree combined

### 5.2.5. Holiday experiences – general holiday preferences

The most preferred holiday was short-haul holidays, e.g. within Europe (43.6%), followed by domestic holidays, e.g. within the UK (29%), and long-haul holidays, e.g. South and South(-East) Asia and Americas (20.5%). Medium-haul holidays, e.g. Turkey, North Africa, were least preferred within the sample (6.9%). In terms of popular overseas holiday destinations, the results were consistent with the top ten destinations (no domestic destinations were considered) by UK residents in 2018 (ONS 2019c), in which all destinations are European countries (including the top three of Spain, France, Italy), with one exception of USA. Visits to medium-haul destinations such as Turkey and North Africa are relatively less popular, though the figures have increased (ONS 2019c). A sightseeing trip (26.5%) and sun and beach holiday (25.2%) were chosen to be favourite holidays of the respondents. The next popular types of holiday were a countryside break, city break and an all-inclusive holiday in order of preference. Other types of holiday included camping, cruise holiday, backpacking, mixed holiday and well-being trips.

The majority of respondents (77%) preferred an independent tour, which is when a tourist plans and organises their own holiday, whilst a package tour was less favoured. There was evidence to suggest an association between age groups and preference for an independent or package tour (Pearson Chi-Square statistic,  $X^2(4)=11.754$ ,  $p=0.019$ ) where 18-27 and 38-47 age groups were found to prefer an independent tour the most (88.4% and 82.7% respectively). Despite not very popular across all age groups, a package tour was preferred by the age group of 28-37 the most (32.9%).

Among those whose age fell in this age group were people with children who tended to be more in favour of a package tour.

Almost two thirds of the sample (60.4%) agreed that they tended to choose a new destination for their holiday. There were significant differences between age groups (Kruskal Wallis statistic,  $X^2(4)=22.098$ ,  $p<0.001$ ). Generation Z and the Millennials (18-27, 28-37) would more likely to choose a new destination than older age groups (48-57, 58 and above). There was a mixed view on 'I normally return to a destination I visited before', where there was slightly more agreement (36.9%) than disagreement (30.9%). There were significant differences between age groups to this idea (Kruskal Wallis statistic,  $X^2(4)=13.815$ ,  $p=0.008$ ), where younger age groups would least revisit the same destination, particularly compared to the older age groups. These findings are in line with Correia et al. (2015). Almeida-Santana and Moreno-Gil (2018) highlight that this is because young people tend to search for something new to experience when going on holiday.

The top three most important factors when choosing a holiday were asked where respondents chose multiple answers up to three (Table 5.7). Overall, the top three factors were related to cost factors (accommodation and transport) and holiday experiences. In particular, transport (travel) cost had a strong impact on the destination choices and mode of transport. The availability of low-cost transport, especially LCCs, has been responsible for increased travel distances of tourists and GHG emissions (Larsen and Guiver 2013). One third considered travel time to/from a destination important.

Table 5.7 Most important factors when choosing a holiday

| <b>Important factor</b>                               | <b>% of the sample</b> |
|-------------------------------------------------------|------------------------|
| Accommodation cost                                    | 60.9%                  |
| Type of experiences you want to have at a destination | 54.7%                  |
| Transport cost                                        | 40.8%                  |
| Travel time (distance) to/from a destination          | 33.2%                  |
| Cost of staying at a destination                      | 32.4%                  |
| Availability of activities and attractions            | 28.5%                  |
| Travel party/companion(s)                             | 24.5%                  |
| Means of transport to/from a destination              | 23.0%                  |
| Other                                                 | 2.0%                   |

### 5.2.6. Recent holiday

Respondents reported how many holiday trips they had taken in the past twelve months in three different holiday types: weekend/short break (between 1 to 3 days), week-long holiday (4 to 7 days) and longer holiday (more than 7 days). Weekend/short break was taken the most: i.e. by 82.2% of the respondents in the past 12 months, compared to week-long holiday (62.4%) and longer holiday (48%). A notable point was with weekend/short breaks which were most popular with full time committed and student respondents (more than 84% of each of these respondents had been on a weekend/short break at least once). The number of recent holiday trips by types was compared with the statement 'with limited vacation time, I prefer taking frequent short breaks in a year, instead of a single, long holiday'. Respondents who at least once took weekend/short break or week holiday agreed to the statement. In contrast, respondents who took longer holidays were likely to disagree with this statement.

In total, 399 respondents provided the specific name of their single most significant holiday destination from their recent holidays. Top three most popular holiday destinations were the UK, Spain and USA in the order of popularity. The city or country given as a response was categorised into three groups of holiday destinations by distance: within the UK (domestic), Europe, outside of Europe. Similar number of respondents visited a destination within the UK or in Europe, while a quarter of the total respondents chose a destination outside of Europe as the most significant holiday. UK holiday destinations were popular with all travel groups (i.e. travel alone or with partner/spouse, children at all age), whereas European destinations were largely visited by people who travelled with their parents and/or friends/relatives.

Table 5.8 shows respondents' recent holiday destinations, categorised by distance, comparing with preferred holidays. There were some consistent results. The majority of those who preferred domestic holidays had recently been on a domestic holiday within the UK. Similarly, most respondents who preferred long-haul holidays had recently been to a holiday destination that was outside of Europe. Most people who preferred short-haul holidays had been to Europe recently, while medium-haul holiday preferring respondents had mostly been to a destination either within Europe or outside of Europe. This is supported by a previous study that finds a particular length of a holiday can be strongly influenced by habitual behaviour. That is, people who

made short or long holidays previously are more likely to take the same holiday length in the future (Grigolon et al. 2014).

Table 5.8 Comparison between recent holiday destination by distance and preferred holidays

| Recent holiday destination | Preferred holiday                 |                                          |                                                  |                                          |
|----------------------------|-----------------------------------|------------------------------------------|--------------------------------------------------|------------------------------------------|
|                            | Domestic holidays (within the UK) | Short-haul holidays (e.g. within Europe) | Medium-haul holidays (e.g. Turkey, North Africa) | Long-haul holidays (e.g. Asia, Americas) |
|                            | % of 114 respondents              | % of 175 respondents                     | % of 28 respondents                              | % of 82 respondents                      |
| Domestic (UK) N=153        | 87.7%                             | 18.3%                                    | 10.7%                                            | 22.0%                                    |
| Europe N=151               | 9.6%                              | 65.7%                                    | 42.9%                                            | 15.9%                                    |
| Outside of Europe N=95     | 2.6%                              | 16.0%                                    | 46.4%                                            | 62.2%                                    |

On average, the length of a recent holiday trip was 8.9 days. Most widely used main mode of transport (to/from a destination) is airplane (51.9%) and then car (30.8%). Considering slightly over 60% of the respondents claimed to have recently undertaken a holiday abroad including Europe and outside of Europe (Table 5.9), this figure of air travel being slightly more than half of the respondents suggests that tourists have most likely taken an airplane for an overseas holiday but may have taken another mode when travelling overseas. Car and sea transport were used as the main transport to travel to Europe by nearly 20% of those who went on a holiday to Europe. Car was most commonly used for a domestic holiday (approximately 70% of respondents who had been to a domestic holiday destination).

Table 5.9 Main mode of transport used for a recent holiday

| Recent holiday destination | Main mode of transport used for the recent holiday<br>% of total responses (N=399) |           |       |          |                        |            |
|----------------------------|------------------------------------------------------------------------------------|-----------|-------|----------|------------------------|------------|
|                            | Car                                                                                | Bus/Coach | Train | Airplane | Ship/Boat/Cruise/Ferry | Camper-van |
| Domestic (UK) (N=153)      | 68.0%                                                                              | 8.5%      | 16.3% | 2.6%     | 1.3%                   | 3.3%       |
| Europe (N=151)             | 11.9%                                                                              | 2.0%      | 4.6%  | 73.5%    | 7.3%                   | 0.7%       |
| Outside of Europe (N=95)   | 1.1%                                                                               | 1.1%      | 0.0%  | 96.8%    | 1.1%                   | 0.0%       |
| Total (N=399)              | 30.8%                                                                              | 4.3%      | 8.0%  | 51.9%    | 3.5%                   | 1.5%       |

Table 5.10 provides more details about the respondents' chosen recent holiday: whom they travelled with and whether they stayed overnight in more than one (multiple) destination. Most commonly they travelled with a partner/spouse. Only about a quarter stayed overnight in more than one destination during the recent holiday and the average number of places they stayed overnight at during the holiday was 8.6 different places.

Table 5.10 Details of a recent holiday trip

| Travel companion <sup>a</sup>                |       |
|----------------------------------------------|-------|
| Partner/spouse                               | 50.5% |
| Family with school-age child/children        | 19.8% |
| Friends or relatives                         | 16.8% |
| Alone                                        | 12.6% |
| Family with pre-school child/children        | 9.7%  |
| Family with child/children over 18 years old | 9.7%  |
| Family with parents                          | 8.4%  |
| Multiple destinations                        |       |
| Yes                                          | 21.8% |
| No                                           | 78.2% |

a. Respondents selected one or more options

### 5.2.7. Choice of environmentally friendly transport on holiday

A neutral stance on both statements asking about tourist perception on their choice of environmentally friendly transport option while on holiday was found dominant (Table 5.11). The two statements were tested against the socio-demographic variables using either the Mann-Whitney U test or the Kruskal-Wallis test. The only significant difference was found between students and retired respondents for the first statement, where students agreed significantly more than retirees ( $X^2(5)=11.124$   $p=0.049$ , pairwise comparison by Post-hoc Dunn test between the two groups  $p=0.043$ ). In this respect, Buffa (2015) finds empirical evidence of younger people, predominantly represented by students, having more of positive environmental attitudes. This may be explained by the greater exposure of young people to the environment-related issues through more informal sources such as social media, and the importance of formal education for sustainable development. People in the youngest group used bus/coach that is less energy-intensive more than the rest (older aged people), despite

airplane being used by the majority. This may have been because of more affordable bus/coach fares than other modes of transport. Meanwhile, Mobley et al. (2009) claim that behaviour is an outcome of certain perceptions and attitudes. Looking from this perspective, the main mode of transport of younger people's recent holiday can be a reflection of their pro-environmental perception and attitudes. On the contrary, Kroesen et al. (2017) provide empirical evidence of the reverse of what Mobley et al. (2009) proposed; pro-environmental behaviour influences pro-environmental attitudes. From this viewpoint, younger respondents may have stated their positive attitudes towards the pro-environment travel options to adjust and align their attitudes with their recent holiday behaviour.

Table 5.11 Respondents' perception on the choice of environmentally friendly transport option on holiday

|                                                                                           | <b>Strongly Disagree<sup>a</sup></b> | <b>Disagree</b> | <b>Neutral</b> | <b>Agree</b> | <b>Strongly Agree</b> | <b>Mean</b> |
|-------------------------------------------------------------------------------------------|--------------------------------------|-----------------|----------------|--------------|-----------------------|-------------|
| If I need a car on holiday, I think it is better to hire an environmentally friendly car. | 7.4%                                 | 13.4%           | 41.3%          | 28.2%        | 9.7%                  | 3.19        |
| While on holiday, it is important to avoid highly carbon-intense modes of transport.      | 9.2%                                 | 11.6%           | 45.0%          | 26.7%        | 7.4%                  | 3.12        |

a. Strongly Disagree=1 and Strongly Agree=5

### **5.3. Time values and time use patterns: Principal component analysis (PCA)**

PCA, as a most common method of factor analysis, is a variable-reduction technique which has a key purpose: to reduce a larger set of variables into a smaller set of latent variables, or components, that are meaningful (Mayers 2013). In this sense, PCA seeks to explore the presence of meaningful components, which could be sub-themes that a questionnaire was investigating. PCA was the most appropriate method of factor analysis in this research because it sought to identify latent variables regarding both psychological values and time use patterns.

Another popular method, common factor analysis (principal axis factoring), was not selected because this method is most likely to be performed to confirm hypotheses about the structure of a questionnaire (Mayers 2013), which did not fit the purpose of the quantitative part of this research. In other words, the analysis was performed in this research to explore if there were common factors underlying a range of time-related psychological values and time use patterns, ahead of subsequent analyses. PCA has been frequently used in tourism studies, for example, relating to identifying resident attitudes towards tourism development and tourists in Africa (Teye et al. 2002), unidimensional construct of an individual involving place attachment, satisfaction and pro-environmental behaviour in a national park of Australia (Ramkisson et al. 2013), and potential consistency and spillover effects between pro-environmental behaviours in domestic and tourism contexts (Xu et al. 2020).

As shown in Table 5.12, 22 statements were included. Within the sample, it was a dominant opinion that time passed quickly on holiday (approximately 85% of agreement, including agree and strongly agree for 2.1e and 2.1d). Most respondents claimed they had flexibility of changing schedules and plans as they wanted (84% of agreement). The most disagreed (disagree and strongly disagree) statement was 2.2b, where people claimed that they did not enjoy any additional time required for reaching the destination (60.7% of disagreement). Slightly over half of all respondents generally use the fastest mode of transport to get to a holiday destination and have travelled more frequently due to LCC services. While respondents were less inclined to use a private car, they would more likely walk/cycle or use public transport at destinations.

Table 5.12 Psychological values and time use patterns: Frequencies and Means

| <b>Statement<sup>bc</sup></b>                                                        | <b>Strongly disagree<sup>a</sup></b> | <b>Disagree</b> | <b>Neutral</b> | <b>Agree</b> | <b>Strongly agree</b> | <b>Mean</b> |
|--------------------------------------------------------------------------------------|--------------------------------------|-----------------|----------------|--------------|-----------------------|-------------|
| 2.1e. At the end of holiday, I felt time had gone by so quickly.                     | 1.2%                                 | 5.2%            | 7.7%           | 41.6%        | 44.3%                 | 4.23        |
| 2.1b. I felt time was going faster when I was doing something enjoyable on holiday.  | 1.0%                                 | 4.0%            | 10.4%          | 51.5%        | 33.2%                 | 4.12        |
| 2.3c. When on holiday, I have flexibility of changing schedules and plans as I want. | 0.5%                                 | 3.7%            | 11.9%          | 59.7%        | 24.3%                 | 4.03        |

|                                                                                                                                          |       |       |       |       |       |      |
|------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|------|
| 2.1a. Time seemed to fly when I was doing something new on holiday.                                                                      | 1.2%  | 4.7%  | 12.9% | 55.9% | 25.2% | 3.99 |
| 2.2g. I want to enjoy quality time on holiday, rather than rushing around, to see or visit most of the things the destination offers.    | 0.2%  | 4.5%  | 18.1% | 56.4% | 20.8% | 3.93 |
| 2.2f. I want to see as many things and do as many activities and experiences as possible when on holiday.                                | 2.2%  | 12.6% | 26.5% | 40.3% | 18.3% | 3.60 |
| 2.4a. I normally use the fastest mode of transport to get to a holiday destination quickly.                                              | 3.5%  | 12.9% | 21.3% | 47.0% | 15.3% | 3.58 |
| 2.2e. My time is limited, and I want to arrive at the destination as quickly as possible in order to spend more time at the destination. | 3.5%  | 15.6% | 24.5% | 42.6% | 13.9% | 3.48 |
| 2.2c. Travel to/from a holiday destination is a necessary evil.                                                                          | 4.5%  | 17.3% | 19.8% | 44.8% | 13.6% | 3.46 |
| 2.1d. When on holiday, I did not keep to mealtimes (e.g. lunch, dinner) as much as I normally do in my day-to-day life.                  | 5.4%  | 22.5% | 14.1% | 40.1% | 17.8% | 3.42 |
| 2.2h. There are so many things I want to do during my holiday, so I often feel time is running out at the end of holiday.                | 4.2%  | 20.0% | 25.0% | 35.9% | 14.9% | 3.37 |
| 2.4e. I prefer walking and/or cycling whenever possible on holiday.                                                                      | 7.7%  | 14.9% | 25.0% | 38.4% | 14.1% | 3.36 |
| 2.4b. 'Low cost' airlines (e.g. easyJet) have enabled me to travel for holiday more frequently.                                          | 10.4% | 14.6% | 23.3% | 33.7% | 18.1% | 3.34 |
| 2.2a. Travel to/from a holiday destination is fun and makes an enjoyable part of my holiday.                                             | 6.4%  | 19.3% | 23.5% | 39.9% | 10.9% | 3.29 |
| 2.4f. I use public transport whenever possible on holiday.                                                                               | 8.2%  | 20.5% | 24.3% | 36.6% | 10.4% | 3.21 |
| 2.4d. In general, I prefer having a vehicle (e.g. my own or rented car) for flexibility at the destination.                              | 17.1% | 22.8% | 17.8% | 28.7% | 13.6% | 2.99 |
| 2.2d. My holiday only starts when I arrive at the destination.                                                                           | 11.9% | 38.6% | 16.6% | 21.3% | 11.6% | 2.82 |
| 2.3a. At the beginning of holiday, I find it hard to schedule my holiday activities in a timely manner                                   | 6.7%  | 43.3% | 23.5% | 23.3% | 3.2%  | 2.73 |



|                                                                                                                                       |       |       |       |       |      |      |
|---------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|------|------|
| because there are so many things to do and see at the destination.                                                                    |       |       |       |       |      |      |
| 2.4c. I normally choose a closer destination to home for my holiday so that I do not waste my limited vacation time on travelling.    | 8.9%  | 39.1% | 26.2% | 21.3% | 4.5% | 2.73 |
| 2.1c. The holiday time seemed to never end at the beginning of holiday.                                                               | 16.3% | 35.6% | 22.8% | 20.5% | 4.7% | 2.62 |
| 2.3b. When on holiday, I have to follow time schedules or plans.                                                                      | 13.4% | 42.6% | 24.5% | 17.6% | 2.0% | 2.52 |
| 2.2b. I enjoy any additional time required for reaching the destination, such as waiting time at the airport or waiting for transfer. | 20.8% | 39.9% | 18.3% | 17.8% | 3.2% | 2.43 |

a. Strongly Disagree=1 and Strongly Agree=5

b. The statements are in the order of the mean value from highest (most agreed) to lowest (least agreed).

c. Numbers with statements are brought from the questionnaire for reference.

PCA involves rotation to “maximise the amount of explained variance (by accounting for all of the variability in those variables)” (Mayers 2013, p.539). Rotation is a technique where the factors are rotated to obtain the simplest and clearest patterns of loadings (Kim and Mueller 1978). Rotation methods are either orthogonal (when the factors are believed to be uncorrelated) or oblique, or nonorthogonal, (correlated) methods (Brown 2009). SPSS offers three orthogonal rotation methods (varimax, quartimax, equamax) and two oblique methods (direct oblimin, promax).

Tabachnick and Fidell (2013, p.651) assert that “the best way to decide between orthogonal and oblique rotation is to request oblique rotation” and they stress to look at the correlations between factors. Accordingly, PCA was initially run with a non-orthogonal, oblique solution, in order to look at the resulting correlation matrix for the factors. Direct oblimin rotation method was used following the suggestion of Kim and Mueller (1978). The highest correlation was 0.189 (Table 5.13) – that is, none of the correlations exceeds the Tabachnick and Fidell (2013) threshold of 0.32; thus, “the solution remains nearly orthogonal” (p.651). As highlighted earlier, orthogonal rotation methods assume that the components are not correlated.

Table 5.13 Component correlation matrix from an initial PCA (Rotation method: Oblimin with Kaiser normalisation)

| <b>Component correlation matrix</b> |          |          |          |          |          |          |          |
|-------------------------------------|----------|----------|----------|----------|----------|----------|----------|
| <b>Component</b>                    | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>7</b> |
| 1                                   | 1.000    | -0.046   | -0.104   | -0.015   | 0.189    | 0.136    | -0.049   |
| 2                                   | -0.046   | 1.000    | -0.043   | 0.089    | -0.052   | 0.078    | 0.093    |
| 3                                   | -0.104   | -0.043   | 1.000    | -0.040   | -0.083   | -0.087   | 0.165    |
| 4                                   | -0.015   | 0.089    | -0.040   | 1.000    | 0.058    | -0.038   | 0.053    |
| 5                                   | 0.189    | -0.052   | -0.083   | 0.058    | 1.000    | 0.090    | 0.042    |
| 6                                   | 0.136    | 0.078    | -0.087   | -0.038   | 0.090    | 1.000    | -0.130   |
| 7                                   | -0.049   | 0.093    | 0.165    | 0.053    | 0.042    | -0.130   | 1.000    |

### 5.3.1. Time values and time use patterns: the seven factor solution

PCA was run on 22 questions again with an orthogonal method, i.e. varimax rotation, which is the most common type of orthogonal rotation, as recommended by Kim and Mueller (1978). Varimax rotation minimises the number of variables that have high loadings on each factor, i.e. to maximise the variance shared among items related to one factor, which simplifies the interpretation of factors (Allen 2017). After a first run with varimax rotation, two items (2.1d and 2.4c) were removed because they did not load on any factor. PCA was run again on 20 remaining questions with the same rotation solution. One item (2.2e) was loading on two factors; thus, it was dropped from further analysis. Table 5.14 presents the items that were removed for the final analysis and the reasons behind their removal. Also, it shows what they were designed to measure reflecting on the conceptual framework (see Figure 2.2 in Chapter 2). The final PCA was run on 19 questions with the same rotation method.

Table 5.14 Items removed from the final run of PCA

| <b>Statement</b>                                                                                                                        | <b>Originally designed to measure:</b>      | <b>Reason for exclusion in final PCA</b> |
|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------|
| 2.1d. When on holiday, I did not keep to mealtimes (e.g. lunch, dinner) as much as I normally do in my day-to-day life.                 | Psychological values: time fluidity         | No factor loading                        |
| 2.4c. I normally choose a closer destination to home for my holiday so that I do not waste my limited vacation time on travelling.      | Time use patterns: en-route                 | No factor loading                        |
| 2.2e. My time is limited and I want to arrive at the destination as quickly as possible in order to spend more time at the destination. | Psychological values: time spending on-site | Cross loading on two factors             |

The Determinant option was sub-commanded. In the expectation from the correlation matrix table was that the determinant is not zero (greater than 0.00001, Field 2018, p799). If the determinant is zero, then there will be computational problems with the analysis, leading to the fact that the analysis would be unable to be completed. The determinant is .005 which is not extremely small so that is very close to 0 (Field 2018).

The Kaiser-Meyer-Olkin (KMO) measure of Sampling Adequacy is a measure of how suited the data is to PCA. The measure considers “the magnitudes of the original bivariate correlations of the variables, as well as the partial correlations of each pair when the other variables in the set are accounted for” (Stehlik-Barry and Babinec 2017, p325). The larger values, yet ranging between 0 and 1, indicate suitability for further analysis. The rule of thumb is 0.8+ meritorious, 0.7-0.8 middling, <0.6 unacceptable or mediocre (Stehlik-Barry and Babinec 2017). In this situation, the KMO value was about .709, indicating the suitability of the data for further analysis by Kaiser's standard.

Bartlett's test of sphericity is the test for the null hypothesis that “a correlation matrix is an identity matrix, which would indicate that variables are unrelated and therefore unsuitable for structure detection” (IBM 2020, p1). Small values (less than 0.05) of the significance level indicate that a factor analysis may be useful with the data. The significance in this case was less than 0.05 ( $p < 0.001$ ), which rejected the null hypothesis. This meant that correlation matrix was not an identity matrix. Thus, a PCA could be performed efficiently on the dataset.

Table 5.15 shows the importance of each of the 19 principal components. Only the first seven had Eigenvalues over 1.00 and together these explained nearly 70% of the total variability in the data, which was valid for a construct (see, % of Total variance explained) (Hair et al. 2010). This led to the conclusion that a seven-factor solution after rotation was adequate. The scree plot (Appendix 7) also supported this conclusion. Table 5.15 contains the loadings of each variable (statement) onto each of the seven factors. Starting from the first factor, each subsequent factor was obtained by extracting the maximum variance removing the variance explained by the previous factor (Tabachnick and Fidell 2013). Thus, the first factor explains the most variance and the last explains the least, i.e. the first is most salient.

Table 5.15 Summary of PCA results: seven factor solution

| Statement                                                                                                                             | Factors                                     |                                             |                                                          |                                                |                                                       |                                                 |                           |
|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------|----------------------------------------------------------|------------------------------------------------|-------------------------------------------------------|-------------------------------------------------|---------------------------|
|                                                                                                                                       | 1                                           | 2                                           | 3                                                        | 4                                              | 5                                                     | 6                                               | 7                         |
|                                                                                                                                       | Perception of travel time for holiday (PTT) | Perception of time passing on holiday (PTP) | Maximising limited time by doing many more on-site (MTO) | Time use and transport behaviour on-site (TTO) | Scheduled time and temporal flexibility on-site (STO) | Time use and transport behaviour en-route (TTE) | Quality time on-site (QT) |
| % of Total variance explained                                                                                                         | 13.6%                                       | 12.7%                                       | 11.8%                                                    | 8.7%                                           | 7.8%                                                  | 7.5%                                            | 6.3%                      |
| 2.2a. Travel to/from a holiday destination is fun and makes an enjoyable part of my holiday.                                          | 0.848                                       |                                             |                                                          |                                                |                                                       |                                                 |                           |
| 2.2d. My holiday only starts when I arrive at the destination.                                                                        | -0.782                                      |                                             |                                                          |                                                |                                                       |                                                 |                           |
| 2.2b. I enjoy any additional time required for reaching the destination, such as waiting time at the airport or waiting for transfer. | 0.779                                       |                                             |                                                          |                                                |                                                       |                                                 |                           |
| 2.2c. Travel to/from a holiday destination is a necessary evil.                                                                       | -0.742                                      |                                             |                                                          |                                                |                                                       |                                                 |                           |
| 2.1b. I felt time was going faster when I was doing something enjoyable on holiday.                                                   |                                             | 0.838                                       |                                                          |                                                |                                                       |                                                 |                           |
| 2.1a. Time seemed to fly when I was doing something new on holiday.                                                                   |                                             | 0.800                                       |                                                          |                                                |                                                       |                                                 |                           |
| 2.1e. At the end of holiday, I felt time had gone by so quickly.                                                                      |                                             | 0.704                                       |                                                          |                                                |                                                       |                                                 |                           |
| 2.1c. The holiday time seemed to never end at the beginning of holiday.                                                               |                                             | -0.596                                      |                                                          |                                                |                                                       |                                                 |                           |
| 2.2f. I want to see as many things and do as many activities and experiences as possible when on holiday.                             |                                             |                                             | 0.750                                                    |                                                |                                                       |                                                 |                           |

|                                                                                                                                                                           |  |  |       |        |        |       |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-------|--------|--------|-------|-------|
| 2.2h. There are so many things I want to do during my holiday, so I often feel time is running out at the end of holiday.                                                 |  |  | 0.746 |        |        |       |       |
| 2.3a. At the beginning of holiday, I find it hard to schedule my holiday activities in a timely manner because there are so many things to do and see at the destination. |  |  | 0.626 |        |        |       |       |
| 2.4f. I use public transport whenever possible on holiday.                                                                                                                |  |  |       | 0.832  |        |       |       |
| 2.4d. In general, I prefer having a vehicle (e.g. my own or rented car) for flexibility at the destination.                                                               |  |  |       | -0.720 |        |       |       |
| 2.4e. I prefer walking and/or cycling whenever possible on holiday.                                                                                                       |  |  |       | 0.553  |        |       |       |
| 2.3c. When on holiday, I have flexibility of changing schedules and plans as I want.                                                                                      |  |  |       |        | 0.837  |       |       |
| 2.3b. When on holiday, I have to follow time schedules or plans.                                                                                                          |  |  |       |        | -0.754 |       |       |
| 2.4a. I normally use the fastest mode of transport to get to a holiday destination quickly.                                                                               |  |  |       |        |        | 0.814 |       |
| 2.4b. 'Low cost' airlines (e.g. easyJet) have enabled me to travel for holiday more frequently.                                                                           |  |  |       |        |        | 0.765 |       |
| 2.2g. I want to enjoy quality time on holiday, rather than rushing around, to see or visit most of the things the destination offers.                                     |  |  |       |        |        |       | 0.869 |

The items that cluster on the same factor represent a variable individually. Table 5.15 displays each factor with a name given taking the pre-defined variables into consideration and how much of the total variance is accounted for under each factor.

### 5.3.2. PCA and the conceptual framework

A series of survey items (questions) were designed, against the conceptual framework (see Figure 2.2 in Chapter 2), to measure and identify the latent variables of psychological values and time use patterns (Column 1 and 2 in Figure 5.2). As a result of PCA, more refined and clearer latent variables relating to time on holiday were identified as per Figure 5.2. Several anticipated latent variables were not observed through in the PCA. The initially defined six latent variables have been restructured as illustrated in Figure 5.2 under *Factors*, with seven latent variables, i.e. factors. The factor scores were subsequently saved for further analysis (see Section 5.4.3).

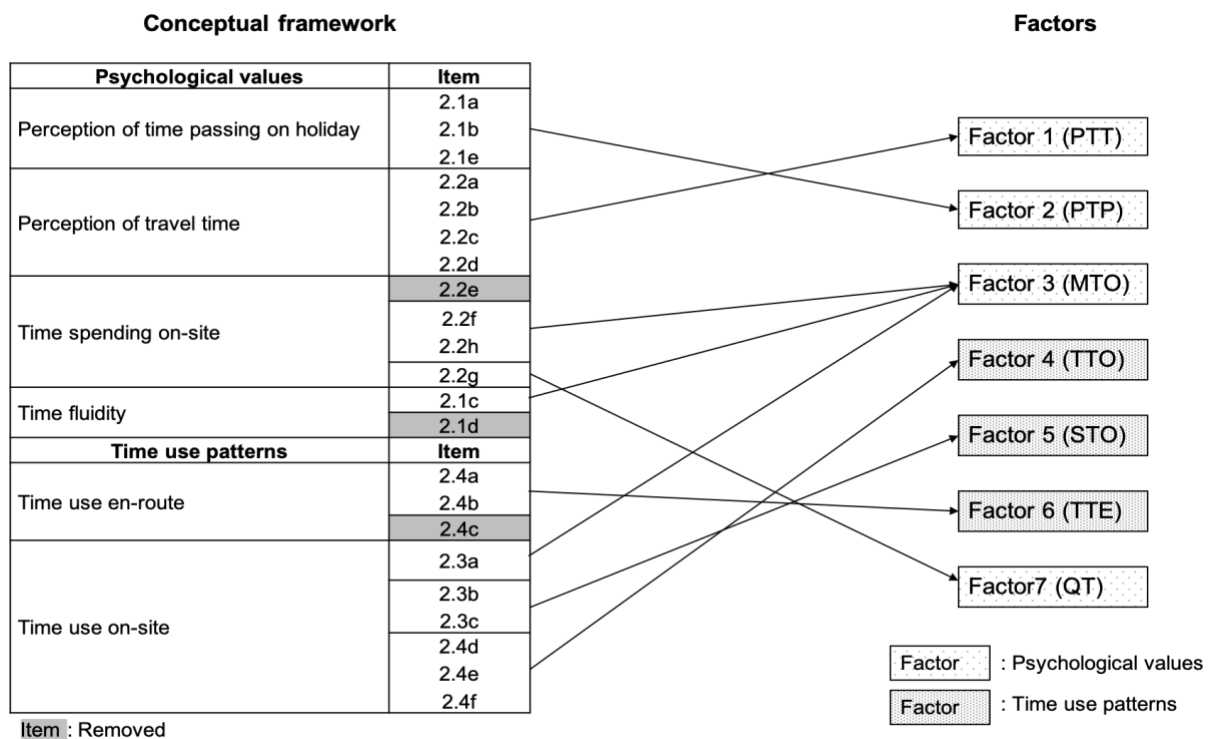


Figure 5.2 Comparison of anticipated latent variables and restructured factors from PCA

#### **5.4. Time values and time use patterns: Cluster analysis**

Cluster analysis is a type of data reduction method which aims to reduce the number of cases by grouping them into homogeneous clusters, identifying groups without previous knowledge of group membership or the number of possible groups (Morissette and Chartier 2013). In exploratory data analysis, allowing many options for classifying groups with each resulting in a different grouping structure, cluster analysis can be a statistical tool for exploring the underlying structures in a range of datasets. The purpose of performing cluster analysis in this research was to identify homogeneous groups of tourists based on how they perceive time and use time on holiday. Moreover, cluster analysis was performed in order to explore whether subgroups (i.e. clusters) with different psychological values and time use patterns would be related to different forms of the TRE. For the latter purpose, the results of cluster analysis were used for further analysis (see Section 5.5.6).

There are two main cluster techniques: hierarchical and non-hierarchical cluster analysis. Hierarchical clustering builds on linking or merging of entities, i.e. linkage, at each step until a single cluster is identified that represents all given cases (Meyers et al. 2013). Non-hierarchical clustering methods establish a classification by dividing a dataset into cluster groups which have no hierarchical relationships between them. These methods assign each cluster to the closest cluster mean (e.g. k-means clustering) (Morissette and Chartier 2013). Non-hierarchical clustering requires a priori to establish the number of clusters, which is not preferred if there is uncertainty about the total number of clusters in the dataset. In hierarchical clustering technique, a researcher fundamentally reruns and compares the clustering results with an increasing number of clusters until the final clustering solution (i.e. the final number of clusters) is determined. Considering this, hierarchical clustering was more appropriate in this research because there was no given number of clusters.

There are two hierarchical clustering methods: agglomerative and divisive (Boehmke and Greenwell 2020). The former is a bottom-up approach where each case is assigned to its own cluster at first and then most similar (proximal) cases or clusters are merged subsequently until only a single cluster remains, whereas the latter links to the opposite, i.e. a top-down approach, with all of the cases starting from a single large cluster and then being clustered into least similar groups of clusters until each

case is in an individual cluster (Han et al. 2012). The latter method is seldom used due to its heavy computational load and complexity (Wilmink and Uytterschaut 1984); therefore, hierarchical agglomerative method was chosen in this research.

The clustering process involves two separate types of calculations: distance between cases and linkage type between clusters (Meyers et al. 2013). Measuring distances is a critical step in clustering, which is defined by proximity (similarity or dissimilarity). Although the Euclidean distance is very popular in clustering, other measures may be preferred depending on the type of the data. The entities are linked together into clusters using several linkage methods including (Meyers et al. 2013, p.624):

- The unweighted pair-group method with arithmetic averages (also called the average linkage between-groups) method,
- The average linkage within-groups method, The nearest neighbour (also called the single linkage) method,
- The furthest neighbour (also called the complete linkage) method,
- The unweighted pair-group centroid method (often called the centroid method),
- The weighted pair-group centroid method (often called the median method),
- Ward's method.

There is no single absolute criterion to decide which method is better than another; however, the researcher instead may run the analysis with some of the other linkage methods to compare the results and select the best fit for the research (Tullis and Albert 2013). Ward's linkage method was chosen to be most appropriate in this research because it performed better than other methods in terms of interpretability, distinguishability and usefulness of clusters (Han et al. 2012). This is a method designed to optimise the minimum variance within clusters, which calculates the sum of the squared distances within each cluster group and then summed over all clusters (Rencher and Christensen 2012). Distances were computed using the Squared Euclidean distance measure as a dissimilarity measure.

#### **5.4.1. Cluster analysis: results and interpretation**

Hierarchical cluster analysis was performed several times on 19 items that measured psychological values and time use patterns excluding items that were removed



following the PCA analysis (see Table 5.15). By using the dendrogram (Appendix 8) and agglomeration schedule (Appendix 9) generated in SPSS, different cluster solutions were compared. Dendrogram is a tree diagram that visualises the hierarchical relationship between cases and agglomeration schedule shows how cases are progressively combined in the clustering process, which helps to decide how many clusters to include in the final solution. While there was a significant increase between stage 402 and 403 in the agglomeration schedule (coefficient) meaning that the optimal number of clusters is 2, the use of the agglomeration coefficient as a stopping rule tends to indicate too few clusters (Hair et al. 2010).

With a three-cluster solution, Cluster 2 of the two-cluster solution remained unchanged (as Cluster 3 in the three-cluster solution) but Cluster 1 was reclassified into Cluster 1 and 2 in the three-cluster solution. Independent T-test was performed to see differences between Cluster 1 and 2 in the three-cluster solution to understand whether the means of answers to psychological values and time use patterns differ based on cluster. There were significant differences ( $p < 0.05$ ) found between the two clusters in responses to psychological values and time use patterns except statements that are under Factor 2 (PTP) and 4 (TTO) from PCA. The size of each cluster was greater than 10% of the sample (Fife-Schaw 1993) in the three-cluster solution. Thus, the three-cluster solution was selected. Table 5.16 presents the frequency of each cluster under the three-cluster solution.

Table 5.16 Frequency of clusters

| <b>Ward Linkage – frequency of three clusters</b> |              |          |
|---------------------------------------------------|--------------|----------|
| <b>Cluster</b>                                    | <b>Count</b> | <b>%</b> |
| 1                                                 | 165          | 40.8     |
| 2                                                 | 113          | 28.0     |
| 3                                                 | 126          | 31.2     |
| Total                                             | 404          | 100      |

Table 5.17 shows which statements were included in cluster analysis against the factors defined from PCA in the section 5.3.1 and level of agreement of each cluster for individual statement. In all statements, there was a statistically significant difference between these groups as a result of a Kruskal-Wallis test ( $p < 0.05$ ), except for 2.4d

and 2.4e of Factor 4 (TTO) (see Appendix 10). Looking at each of the statements comparing cluster groups with the use of Crosstabulation in SPSS, distinctive features were identified (Figure 5.3).

Table 5.17 Agreement for each statement by cluster

| Factor               | Statement                                                                                                                             | Agreement (%) <sup>ab</sup>             |                                     |                                           |                  |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------|-------------------------------------------|------------------|
|                      |                                                                                                                                       | Cluster 1<br>N=165<br>Travel time lover | Cluster 2<br>N=113<br>Busy explorer | Cluster 3<br>N=126<br>Quality time seeker | Overall<br>N=404 |
| Psychological values |                                                                                                                                       |                                         |                                     |                                           |                  |
| F1 PTT               | 2.2a. Travel to/from a holiday destination is fun and makes an enjoyable part of my holiday.                                          | 87.2%                                   | 23.9%                               | 27.0%                                     | 50.8%            |
|                      | 2.2b. I enjoy any additional time required for reaching the destination, such as waiting time at the airport or waiting for transfer. | 44.9%                                   | 2.7%                                | 6.3%                                      | 21.0%            |
|                      | 2.2c. Travel to/from a holiday destination is a necessary evil.                                                                       | 29.7%                                   | 84.1%                               | 73.0%                                     | 58.4%            |
|                      | 2.2d. My holiday only starts when I arrive at the destination.                                                                        | 9.1%                                    | 54.8%                               | 44.5%                                     | 32.9%            |
| F2 PTP               | 2.1a. Time seemed to fly when I was doing something new on holiday.                                                                   | 90.9%                                   | 96.5%                               | 54.7%                                     | 81.1%            |
|                      | 2.1b. I felt time was going faster when I was doing something enjoyable on holiday.                                                   | 93.9%                                   | 95.5%                               | 62.7%                                     | 84.7%            |
|                      | 2.1c. The holiday time seemed to never end at the beginning of holiday.                                                               | 18.2%                                   | 20.4%                               | 38.9%                                     | 25.2%            |
|                      | 2.1e. At the end of holiday, I felt time had gone by so quickly.                                                                      | 93.9%                                   | 93.8%                               | 68.3%                                     | 85.9%            |
| F3 MTO               | 2.2f. I want to see as many things and do as many activities and experiences as possible when on holiday.                             | 66.6%                                   | 81.4%                               | 27.8%                                     | 58.6%            |
|                      | 2.2h. There are so many things I want to do during my holiday, so I often feel time is running out at the end of holiday.             | 57.6%                                   | 74.3%                               | 20.7%                                     | 50.8%            |
|                      | 2.3a. At the beginning of holiday, I find it hard to schedule my holiday activities in a timely manner                                | 26.0%                                   | 51.3%                               | 4.8%                                      | 26.5%            |

|                   |                                                                                                                                       |       |       |       |       |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|
|                   | because there are so many things to do and see at the destination.                                                                    |       |       |       |       |
| F7 QT             | 2.2g. I want to enjoy quality time on holiday, rather than rushing around, to see or visit most of the things the destination offers. | 79.4% | 63.7% | 86.5% | 77.2% |
| Time use patterns |                                                                                                                                       |       |       |       |       |
| F4 TTO            | 2.4d. In general, I prefer having a vehicle (e.g. my own or rented car) for flexibility at the destination.                           | 40.6% | 37.1% | 49.3% | 42.3% |
|                   | 2.4e. I prefer walking and/or cycling whenever possible on holiday.                                                                   | 53.3% | 51.3% | 52.4% | 52.5% |
|                   | 2.4f. I use public transport whenever possible on holiday.                                                                            | 53.4% | 49.6% | 36.5% | 47.0% |
| F5 STO            | 2.3b. When on holiday, I have to follow time schedules or plans.                                                                      | 18.2% | 29.2% | 12.7% | 19.6% |
|                   | 2.3c. When on holiday, I have flexibility of changing schedules and plans as I want.                                                  | 84.2% | 77.0% | 89.7% | 84.0% |
| F6 TTE            | 2.4a. I normally use the fastest mode of transport to get to a holiday destination quickly.                                           | 56.9% | 71.7% | 61.1% | 62.3% |
|                   | 2.4b. 'Low cost' airlines (e.g. easyJet) have enabled me to travel for holiday more frequently.                                       | 52.7% | 66.4% | 37.3% | 51.8% |

a. Agreement: Strongly Agree and Agree combined

b. Coloured: highest value across the clusters

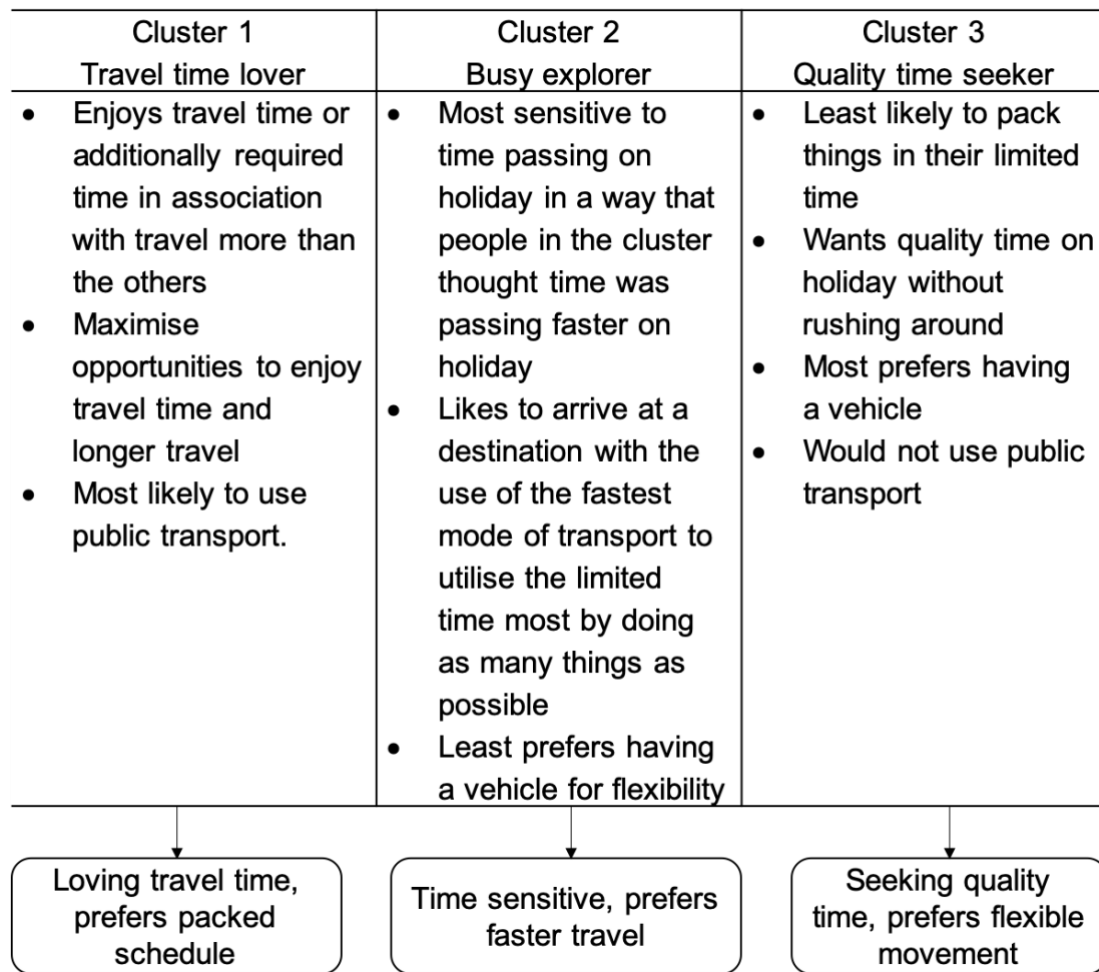


Figure 5.3 Features of each cluster

For each cluster, statements with either higher or lower levels of agreement compared to other clusters were identified. This was used to establish salient psychological values or time use patterns between clusters and to name the cluster groups as in Table 5.17.

#### 5.4.2. Description of each cluster

Table 5.18 presents the profile of each cluster in terms of socio-demographic characteristics, holiday preferences and availability (time and financial), including the results of Pearson Chi-Square tests (significant level at 0.05). There were several notable differences between the clusters taking into consideration their distinctive psychological values and time use patterns.

Members of the 'Busy explorer' cluster (Cluster 2 in Figure 5.3) are comparably younger and mostly occupied in full-time positions and, thus, on time constraints for holidays as they perceived, which may be related to their slightly greater preferences to organised trips than others. In other words, people in this group tend to have more of time pressure in holiday trips in general and also managing all desired activities at a destination, compared to others, while seeking to explore unknown destinations. People may often use an organised tour operator or even plan their itinerary before departure and then follow a certain path without considerable changes at the destination so that they can achieve more things, not missing out any single one of the main activities and attractions, despite limited time budgets (Chang 2007).

In contrast, as members of the 'Quality time seeker' cluster are comparably older and retired, they have more time and are flexible when it comes to holiday experiences. When considering mobility in this cluster, their holiday patterns are fairly predictable in terms of preferring domestic holidays the most and not rushing around for more activities/attractions at a holiday destination due to physical ability limiting their access to choices (Davison and Ryley 2013). The 'Quality time seeker' consists of more of the highest income groups than any other cluster groups.

The 'Travel time lovers' are situated in between the other two clustering groups in terms of age, i.e. mixed age groups. This cluster group includes more students and part-time committed, compared to the other clusters, which is closely linked to the lowest income group within the sample, compared to the other clustering groups. While they are quite flexible tourists in terms of time, their travel choices may be mainly determined by travel costs, as found by Grigolon et al. (2012). The 'Travel time lovers' place the greatest value on the enjoyment of travelling to/from a destination, which is closely associated with their greater preference for long-haul holidays across the clusters.

Table 5.18 Profile of each cluster

| Variable<br>(Pearson Chi-Square)                    | Cluster 1                    | Cluster 2                | Cluster 3                      |
|-----------------------------------------------------|------------------------------|--------------------------|--------------------------------|
|                                                     | Travel time lover<br>(N=165) | Busy explorer<br>(N=113) | Quality time seeker<br>(N=126) |
| Socio-demographic characteristics                   |                              |                          |                                |
| Age ( $X^2(8) = 16.045, p = 0.042$ )                |                              |                          |                                |
| 18-27                                               | 17.0%                        | <b>23.9%</b>             | 11.1%                          |
| 28-37                                               | 15.2%                        | <b>22.1%</b>             | <b>18.3%</b>                   |
| 38-27                                               | <b>20.6%</b>                 | <b>19.5%</b>             | 15.1%                          |
| 48-57                                               | 14.5%                        | 12.4%                    | <b>22.2%</b>                   |
| 58 and above                                        | <b>32.7%</b>                 | 22.1%                    | <b>33.3%</b>                   |
| Gender ( $X^2(2) = 0.324, p = 0.850$ )              |                              |                          |                                |
| Female                                              | 50.9%                        | 49.6%                    | <b>53.2%</b>                   |
| Male                                                | <b>49.1%</b>                 | <b>50.4%</b>             | 46.8%                          |
| Employment status ( $X^2(10) = 10.162, p = 0.426$ ) |                              |                          |                                |
| Full-time committed                                 | 44.2%                        | <b>54.0%</b>             | 46.0%                          |
| Part-time committed                                 | <b>27.3%</b>                 | 22.1%                    | 23.0%                          |
| Unemployed                                          | 4.8%                         | 4.4%                     | <b>7.9%</b>                    |
| Student                                             | <b>7.9%</b>                  | <b>7.1%</b>              | 3.2%                           |
| Retired                                             | 13.9%                        | 9.7%                     | <b>18.3%</b>                   |
| Unable to work                                      | 1.8%                         | <b>2.7%</b>              | 1.6%                           |
| Having children ( $X^2(2) = 1.102, p = 0.576$ )     |                              |                          |                                |
| Yes                                                 | <b>40.6%</b>                 | 36.3%                    | <b>42.9%</b>                   |
| No                                                  | 59.4%                        | <b>63.7%</b>             | 57.1%                          |
| Holiday preference                                  |                              |                          |                                |
| Travel distance ( $X^2(6) = 6.888, p = 0.331$ )     |                              |                          |                                |
| Domestic                                            | <b>29.1%</b>                 | 23.9%                    | <b>33.3%</b>                   |
| Short-haul                                          | 41.2%                        | <b>46.9%</b>             | <b>43.7%</b>                   |
| Medium-haul                                         | 6.1%                         | <b>10.6%</b>             | 4.8%                           |
| Long-haul                                           | <b>23.6%</b>                 | 18.6%                    | 18.3%                          |
| Favourite type ( $X^2(10) = 15.097, p = 0.129$ )    |                              |                          |                                |
| City break                                          | <b>17.0%</b>                 | <b>15.9%</b>             | 12.7%                          |
| Sun and beach                                       | 18.8%                        | <b>27.4%</b>             | <b>31.7%</b>                   |
| Countryside break                                   | 19.4%                        | 11.5%                    | <b>16.7%</b>                   |
| Sightseeing trip                                    | <b>27.9%</b>                 | <b>29.2%</b>             | 22.2%                          |
| All-inclusive                                       | 12.7%                        | <b>15.9%</b>             | 12.7%                          |
| Other                                               | <b>4.2%</b>                  | 0.0%                     | <b>4.0%</b>                    |
| Independency ( $X^2(2) = 0.637, p = 0.727$ )        |                              |                          |                                |
| A package tour                                      | <b>23.6%</b>                 | <b>24.8%</b>             | 20.6%                          |
| An independent tour                                 | 76.4%                        | 75.2%                    | <b>79.4%</b>                   |
| Choice of destination (agreement)                   |                              |                          |                                |

|                                                                                                                    |              |              |              |
|--------------------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|
| Choose a new destination (n=327) ( $X^2(2)$ =8.879, $p=0.012$ )                                                    |              |              |              |
| Agreed                                                                                                             | <b>87.6%</b> | <b>86.2%</b> | 73.9%        |
| Disagreed                                                                                                          | 12.4%        | 13.8%        | <b>26.1%</b> |
| Return the same destination (n=379) ( $X^2(2)$ =6.405, $p=0.041$ )                                                 |              |              |              |
| Agreed                                                                                                             | 65.4%        | 60.4%        | <b>75.9%</b> |
| Disagreed                                                                                                          | <b>34.6%</b> | <b>39.6%</b> | 24.1%        |
| Availability (agreement)                                                                                           |              |              |              |
| Time 1: Enough free time in general (n=363) ( $X^2()$ =7.787, $p=0.020$ )                                          |              |              |              |
| Agreed                                                                                                             | <b>83.0%</b> | 72.7%        | <b>87.2%</b> |
| Disagreed                                                                                                          | 17.0%        | <b>27.3%</b> | 12.8%        |
| Time 2: Enough time to manage all desired activities on-site (n=356) ( $X^2(2)$ =13.781, $p=0.001$ )               |              |              |              |
| Agreed                                                                                                             | <b>88.6%</b> | 75.8%        | <b>92.9%</b> |
| Disagreed                                                                                                          | 11.4%        | <b>24.2%</b> | 7.1%         |
| Time 3: Frequent short breaks than a single long holiday, with limited time (n=300) ( $X^2(2)$ =3.363, $p=0.186$ ) |              |              |              |
| Agreed                                                                                                             | <b>57.6%</b> | <b>53.6%</b> | 45.1%        |
| Disagreed                                                                                                          | 42.4%        | 46.4%        | <b>54.9%</b> |
| Money - household income ( $X^2(10)$ =10.288, $p=0.416$ )                                                          |              |              |              |
| Below £12,500                                                                                                      | <b>13.3%</b> | 10.6%        | 8.7%         |
| £12,501-£20,000                                                                                                    | <b>17.6%</b> | <b>19.5%</b> | 10.3%        |
| £20,001-£30,000                                                                                                    | 20.6%        | 22.1%        | <b>28.6%</b> |
| £30,001-£40,000                                                                                                    | 16.4%        | 16.8%        | <b>19.8%</b> |
| £40,001-£50,000                                                                                                    | <b>14.5%</b> | 11.5%        | 9.5%         |
| Above £50,000                                                                                                      | 17.6%        | 19.5%        | <b>23.0%</b> |

Note 1: Coloured value is the highest value across the clusters

Note 2: Bolded value is higher value than the corresponding overall figure

### 5.4.3. Factor scores and clusters

Further analysis was performed to explore the relationship between cluster memberships and each factor identified in the PCA. Table 5.19 presents means of factor scores and the standard deviations of the seven factors by the cluster groups. The bigger a mean value of a particular factor is, the more strongly the factor is related to that cluster. Negative mean values indicate negative responses to the factors in each cluster (Thurau et al. 2007).

Cluster 1 is closely associated with PTT. Cluster 2 has high positive mean scores in MTO and TTE and a negative mean score in STO. Cluster 3 has high negative ratings for PTP and TTO and high positive rating for QT. These findings well connect with how the respondents were clustered based on their responses to items under psychological values on time and time use patterns (see Table 5.19). There were statistically significant differences between cluster groups as determined by one-way ANOVA except for Factor 4. Post-hoc analysis (Turkey test) revealed that the pairs of Cluster 1 and 3 and Cluster 2 and 3 were most different, followed by the pair of Cluster 1 and 2.



Table 5.19 Mean of factor scores from PCA by cluster

|                | Cluster 1<br>Travel time lover |            | Cluster 2<br>Busy explorer |            | Cluster 3<br>Quality time seeker |            | Chi-Square                                |                            |
|----------------|--------------------------------|------------|----------------------------|------------|----------------------------------|------------|-------------------------------------------|----------------------------|
|                | M                              | SD         | M                          | SD         | M                                | SD         | X <sup>2</sup>                            | Cluster Group <sup>a</sup> |
| Factor 1 (PTT) | 0.8176153                      | 0.61131434 | -0.6788370                 | 0.68771297 | -0.4618885                       | 0.89212927 | X <sup>2</sup> (2)=<br>94.628,<br>p<0.001 | 1-2, 1-3                   |
| Factor 2 (PTP) | 0.2747629                      | 0.75176037 | 0.2923977                  | 0.66665547 | -0.6220383                       | 1.23180921 | X <sup>2</sup> (2)=<br>35.436,<br>p<0.001 | 1-3, 2-3                   |
| Factor 3 (MTO) | 0.0407583                      | 0.92246018 | 0.6251627                  | 0.66850036 | -0.6140358                       | 0.98569886 | X <sup>2</sup> (2)=<br>45.972,<br>p<0.001 | 1-2, 1-3,<br>2-3           |
| Factor 4 (TTO) | 0.0747029                      | 1.01885264 | 0.0701548                  | 0.90658762 | -0.1607418                       | 1.04296732 | X <sup>2</sup> (2)=<br>2.366,<br>p=0.094  | -                          |
| Factor 5 (STO) | 0.0486472                      | 0.95892288 | -0.2415079                 | 1.10442656 | 0.1528857                        | 0.919379   | X <sup>2</sup> (2)=<br>4.963,<br>p=0.007  | 1-2, 2-3                   |
| Factor 6 (TTE) | -0.0532862                     | 1.14428348 | 0.1941300                  | 0.7868881  | -0.1043212                       | 0.95000207 | X <sup>2</sup> (2)=<br>3.049,<br>p=0.047  | -                          |
| Factor 7 (QT)  | -0.0331662                     | 0.90885968 | -0.2604231                 | 1.10515768 | 0.2769860                        | 0.95173886 | X <sup>2</sup> (2)=<br>8.756,<br>p<0.001  | 1-3, 2-3                   |

Note1: Coloured value denotes the highest mean score across the clusters in relation to each factor

a. Cluster Group indicates the pair clustering groups that showed significant difference in between.

## 5.5. TRE

There were 17 statements to measure the potential TREs regarding TRE destination choices, en-route and on-site (Table 5.20). As shown in the table, the TREs in the aspect of on-site holds a more prominent effect as the time savings facilitate more probability to engage in additional activities at destination (i.e. statements 3.1e, 3.3a and 3.2a with approximately 80% or higher level of agreement). There was disagreement in responses to several statements. Amongst, there appeared most disagreement with spending the extra time in/around home before departure and after the holiday (53.9%, disagree and strongly disagree), which implies that people would rather utilise the additional time to expand their holiday trip (i.e. direct, holiday-related time use) rather than for an indirect (non-holiday-related) use. Majority of the respondents disagreed that the time savings would not change their current travel behaviour, meaning that the potential behavioural changes (TRE) are likely to occur with the intervention of the time saving technology en-route.

Table 5.20 Frequency of TRE statements

| TRE statement                                                                                                                                             | Strongly disagree <sup>a</sup> | Disagree | Neutral | Agree | Strongly agree | Mean |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------|---------|-------|----------------|------|
| TRE destination choices                                                                                                                                   |                                |          |         |       |                |      |
| 3.2a. I would still go to the same destination and use the time saved from travel to do something at the destination.                                     | 0.7%                           | 5.9%     | 15.3%   | 58.7% | 19.3%          | 3.90 |
| 3.2b. I would still go to the same destination, but use the time saved from travel to do something in/around home before departure and after the holiday. | 12.1%                          | 41.8%    | 24.8%   | 16.8% | 4.5%           | 2.60 |
| 3.2c. I would travel to the same destination but more frequently.                                                                                         | 6.9%                           | 28.5%    | 38.1%   | 23.8% | 2.7%           | 2.87 |
| 3.2d. I would go to a new destination which is further away.                                                                                              | 3.5%                           | 12.6%    | 21.8%   | 46.5% | 15.6%          | 3.58 |

|                                                                                                                |                                 |                    |                |                    |                    |             |
|----------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------|----------------|--------------------|--------------------|-------------|
| 3.2e. I would travel more frequently regardless of the travel distance to destinations.                        | 7.7%                            | 26.5%              | 36.1%          | 25.2%              | 4.5%               | 2.92        |
| TRE en-route                                                                                                   |                                 |                    |                |                    |                    |             |
| 3.1a. This technology would enable me to travel longer distances (outside Europe) for holiday.                 | 2.2%                            | 5.7%               | 14.9%          | 52.7%              | 24.5%              | 3.92        |
| 3.1b. This technology would enable me to travel longer distances (outside Europe) more frequently for holiday. | 3.2%                            | 14.9%              | 24.3%          | 37.6%              | 20.0%              | 3.56        |
| 3.1c. I would travel shorter distances but more frequently for holiday.                                        | 4.5%                            | 27.7%              | 31.9%          | 29.0%              | 6.9%               | 3.06        |
| 3.1d. I would travel more frequently for holidays in general.                                                  | 3.2%                            | 17.8%              | 26.2%          | 40.3%              | 12.4%              | 3.41        |
| 3.1g. The time savings offered by this technology would not change my current travel behaviour.                | 12.1%                           | 37.1%              | 27.7%          | 18.6%              | 4.5%               | 2.66        |
| TRE on-site                                                                                                    |                                 |                    |                |                    |                    |             |
| 3.1e. With the saved time, I would be happy to spend more time at the destination.                             | 1.0%                            | 2.2%               | 10.1%          | 53.5%              | 33.2%              | 4.16        |
| 3.1f. I would engage in more activities/ attractions at the destination.                                       | 2.5%                            | 8.9%               | 27.7%          | 45.3%              | 15.6%              | 3.63        |
|                                                                                                                | <b>Least likely<sup>a</sup></b> | <b>Less likely</b> | <b>Neutral</b> | <b>More likely</b> | <b>Most likely</b> | <b>Mean</b> |
| 3.3a. I would go sightseeing around the place.                                                                 | 1.5%                            | 5.4%               | 13.6%          | 60.6%              | 18.8%              | 3.90        |
| 3.3b. I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). | 17.6%                           | 27.5%              | 25.7%          | 23.5%              | 5.7%               | 2.72        |
| 3.3c. I would just relax in/around my holiday accommodation.                                                   | 3.7%                            | 12.4%              | 21.8%          | 49.0%              | 13.1%              | 3.55        |
| 3.3d. I would go somewhere to eat/drink.                                                                       | 0.7%                            | 5.4%               | 20.0%          | 57.2%              | 16.6%              | 3.83        |
| 3.3e. I would visit another place (i.e. a nearby town/city).                                                   | 3.5%                            | 17.6%              | 24.8%          | 41.1%              | 13.1%              | 3.43        |

a. Strongly Disagree; Least likely=1 and Strongly Agree; Most likely=5

Note1: Cells with colour are where the statement had the highest score in the relevant type of TRE.

Red coloured items indicate the overall response to the statement was agreement.

To investigate the key factors influencing tourist behavioural changes on holiday in association with time savings and to explore relevant potential TREs, a series of statistical tests were performed. The followings are the key factors that were featured in the conceptual framework (see Figure 2.2 in Chapter 2) and then identified in the qualitative research findings. These influential factors were tested against relevant potential TRE statements.

- Socio-demographic factors
- Holiday preferences
- Availability (constraint)
- Choice of environmentally friendly modes of transport on holiday
- Psychological values
- Time use patterns

Unlike the initial design, based on the findings in the previous sections, time use patterns were considered as a stand-alone variable along with other variables from the framework that directly influence TRE occurrence. TRE in all aspects were also explored in relation to cluster groups that were classified in the cluster analysis.

### **5.5.1. TRE and socio-demographic factors**

Socio-demographic factors were tested against these statements to explore the impact of socio-demographic factors: age; employment status; gender; household income; children in the household, on the occurrence of potential TREs, which addresses behavioural changes and thus implications for the potential TREs. Kruskal-Wallis test and/or Mann-Whitney U test was performed for each socio-demographic factor.

#### **1) Age and the potential TREs**

A Kruskal-Wallis test was performed in order to determine whether there were differences in the level of agreement to the TRE statements, based on respondents' age. The Kruskal-Wallis test showed there was a statistically significant difference in potential occurrence of several TREs among different age groups as described in

Table 5.21. The test provided strong evidence of the differences between the mean ranks of at least one pair of age groups on six items stating the potential TREs. Post-hoc Dunn's pairwise tests were carried out for the ten pairs of age groups, adjusted using the Bonferroni correction to reduce the Type I error, in order to further explore which age groups were significantly different from each other. There was no significant difference among the age groups in response to the statements not listed in the table below. Unless otherwise specified in the Result column, responses of the other pairs were not statistically significantly different.

Table 5.21 Age and the potential TRE

| TRE statement                                                                                                  | Outcome of Kruskal-Wallis test & Post-hoc test comparison groups                                                   | Result (Mean rank)                                                                                                                                                                     | Agreement/ Likelihood <sup>a</sup> |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| TRE with destination choices                                                                                   |                                                                                                                    |                                                                                                                                                                                        |                                    |
| 3.2d. I would go to a new destination which is further away.                                                   | X <sup>2</sup> (4)=13.481<br>p=0.009<br><br>58 and above with18-27 (p=0.035)                                       | Respondents aged 58 and above (181.33) agreed to this statement significantly less than those who were in the age group of 18-27 (229.60).                                             | 18-27                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 28-37                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 38-47                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 48-57                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 58+                                |
| TRE en-route                                                                                                   |                                                                                                                    |                                                                                                                                                                                        |                                    |
| 3.1a. This technology would enable me to travel longer distances (outside Europe) for holiday.                 | X <sup>2</sup> (4)=18.554<br>p=0.001<br><br>58 and above with18-27 (p=0.002);<br>58 and above with 28-37 (p=0.009) | Respondents who are in the age group 58 and above (171.40) agreed to this statement significantly less than those who are in the age groups of both 18-27 (231.71) and 28-37 (223.71). | 18-27                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 28-37                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 38-47                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 48-57                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 58+                                |
| 3.1b. This technology would enable me to travel longer distances (outside Europe) more frequently for holiday. | X <sup>2</sup> (4)=19.107<br>p=0.001<br><br>58 and above with18-27 (p=0.009);<br>58 and above with 28-37 (p=0.001) | Respondents who are in the age group 58 and above (171.86) agreed to this statement significantly less than those who are in the age groups of both 18-27 (227.91) and 28-37 (235.03). | 18-27                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 28-37                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 38-47                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 48-57                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 58+                                |
| TRE on-site                                                                                                    |                                                                                                                    |                                                                                                                                                                                        |                                    |
| 3.3a. I would go sightseeing                                                                                   | X <sup>2</sup> (4)=11.856<br>p=0.018                                                                               | Respondents who are in the age group 48-57 (178.82) would                                                                                                                              | 18-27                              |
|                                                                                                                |                                                                                                                    |                                                                                                                                                                                        | 28-37                              |

|                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              |       |
|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| around the place.                                                                                              | 48-57 with 18-27 (p=0.009)                                                                                                                                                                              | significantly less likely do such than those who are in the age groups of 18-27 (237.23).                                                                                                                                                                                                    | 38-47 |
|                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              | 48-57 |
|                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              | 58+   |
| 3.3b. I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). | $X^2(4)=31.973$<br>$p<0.001$<br>48-57 with 18-27 (p<0.001);<br>48-57 with 28-37 (p=0.033)<br>58 and above with 18-27 (p<0.001); 58 and above with 28-37 (p=0.011);<br>58 and above with 38-47 (p=0.025) | Respondents who are in the age group 48-57 (168.52) would significantly less likely do such than those who are in the age groups of both 18-27 (248.57) and 28-37 (225.07), and the age group 58 and above (170.04) than those who are in the age groups of 18-27, 28-37 and 38-47 (220.42). | 18-27 |
|                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              | 28-37 |
|                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              | 38-47 |
|                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              | 48-57 |
|                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              | 58+   |
| 3.1f. I would engage in more activities/ attractions at the destination.                                       | $X^2(4)=14.665$<br>$p=0.005$<br>48-57 with 28-37 (p=0.031);<br>58 and above with 28-37 (p=0.041)                                                                                                        | Respondents who are in the age group 28-37 (Mean rank=231.85) would significantly more likely do such than those who are in the age groups of both 48-57 (176.70) and 58 and above (185.21).                                                                                                 | 18-27 |
|                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              | 28-37 |
|                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              | 38-47 |
|                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              | 48-57 |
|                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              | 58+   |

a. In Agreement/Likelihood, Blue colour for agreed/likely and Orange colour for disagreed/unlikely.

Consistent results were presented when it comes to the TRE destination choices and en-route statements. Respondents in the oldest age group were not very interested in changing their travel behaviour due to the time savings from faster travel technology compared to younger age groups of 18-27 and 28-37. Younger tourists would travel longer distances for holiday in general or even more frequently, taking advantage of faster travel technology. In contrast, older tourists were less likely to travel further away or longer distances, which supports the study of Pattersson and Schmöcker (2010) that finds as people get older, they tend to make short distance trips and spend longer time at each destination. Aging is accompanied by many individual changes which influence travel choices and activities of tourists. In particular, the travel behaviour of senior tourists is significantly more likely constrained by age, disability, physical and

mental weaknesses and health conditions, as repeatedly identified by Lee and Tideswell (2005); Kattiyapornpong and Miller (2009); Huber et al. (2018). In this regard, the intervention of time savings has fewer implications for the potential TRE of older tourists than their younger counterparts.

Such constraints may also interact with participation in tourist activities at the destination as similar results were found in terms of TRE on-site. Time savings from the faster travel technology were considered beneficial to younger tourists in terms of utilising the time at a destination by engaging in more adventurous and exploring activities. The physical infirmity of old age groups may prevent them from undertaking more activities that require physical and active movement and additional travels. In addition, younger tourists represented by the Millennials may be more prone to such activities as they tend to have higher interests in risk-taking and adventurous tourist activities than older tourists (Pizam et al. 2004). This characteristic links to the potential TRE on-site. Moreover, as shown in Section 5.2.5, young tourists had a low tendency to repeat visits which is connected with them seeking novel experiences (Correia et al. 2015; Almeida-Santana and Moreno-Gil 2018). Thus, the time savings would enable young tourists to travel further afield, i.e. to the more unknown, or to broaden the spectrum of on-site activities, indicating potentially larger carbon impacts.

## **2) Employment status and the potential TREs**

A Kruskal-Wallis test showed there was a statistically significant difference in the occurrence of potential TREs between different employment status groups as described in Table 5.22. Post-hoc Dunn's pairwise tests were conducted, adjusted using the Bonferroni correction, and strong evidence of a difference between the mean ranks of at least one pair of employment groups on five statements of the potential TREs was found from the test results. There was no significant difference among the employment status groups in response to the TRE statements not listed in the table below. Unless otherwise specified in the Result column, responses of the other pairs were not statistically significantly different.

Table 5.22 Employment status and the potential TRE

| TRE statement                                                                                                  | Outcome of Kruskal-Wallis test & Post-hoc test comparison groups                                                                                                                                                             | Result                                                                                                                                                                                                                                                                                                  | Agreement/ Likelihood <sup>a</sup> |
|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| TRE destination choices                                                                                        |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         |                                    |
| 3.2d. I would go to a new destination which is further away.                                                   | X <sup>2</sup> (5)=26.480<br>p<0.001<br><br>Unable to work-Full time (p=0.029);<br>Unable to work-Unemployed (p=0.019);<br>Unable to work-Student (p=0.002)<br><br>Retired-Full time (p=0.033);<br>Retired-Student (p=0.003) | Respondents who are unable to work (87.94) agreed to this statement significantly less than the full time committed (210.72), unemployed (233.43) or student (257.28).<br><br>Respondents who are retired (160.04) agreed to this statement significantly less than the full time committed or student. | Full-time                          |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Part-time                          |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Unemployed                         |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Student                            |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Retired                            |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Unable to work                     |
| TRE en-route                                                                                                   |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         |                                    |
| 3.1a. This technology would enable me to travel longer distances (outside Europe) for holiday.                 | X <sup>2</sup> (5)=25.828<br>p<0.001<br><br>Retired-Part time (p=0.004);<br>Retired-Full time (p=0.001);<br>Retired-Student (p=0.002)                                                                                        | Respondents who are retired (146.11) agreed to this statement significantly less than the part time committed (210.26), full time committed (211.40) or student (244.24).                                                                                                                               | Full-time                          |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Part-time                          |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Unemployed                         |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Student                            |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Retired                            |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Unable to work                     |
| 3.1b. This technology would enable me to travel longer distances (outside Europe) more frequently for holiday. | X <sup>2</sup> (5)=24.767<br>p<0.001<br><br>Retired-Part time (p=0.005);<br>Retired-Full time (p<0.001);<br>Retired-Unemployed (p=0.049);<br>Retired-Student (p=0.013)                                                       | Respondents who are retired (141.11) agreed to this statement significantly less than the part time committed (208.11), full time committed (214.58), unemployed (222.48) or student (230.64).                                                                                                          | Full-time                          |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Part-time                          |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Unemployed                         |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Student                            |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Retired                            |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Unable to work                     |
| 3.1g. The time savings offered by this technology would not change my current travel behaviour.                | X <sup>2</sup> (5)=12.576<br>p=0.028<br><br>Part time-Retired (p=0.015);<br>Full time-Retired (p=0.018)                                                                                                                      | Respondents who are retired (250.27) agreed to this statement significantly more than those the part time committed (188.86) or full time committed (195.65).                                                                                                                                           | Full-time                          |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Part-time                          |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Unemployed                         |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Student                            |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Retired                            |
|                                                                                                                |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                         | Unable to work                     |



| TRE on-site                                                                                                    |                                                                                                        |                                                                                                                                            |                |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 3.3b. I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). | $\chi^2 (5)=25.940$<br>$p<0.001$<br><br>Retired-Full time ( $p=0.006$ ); Retired-Student ( $p<0.001$ ) | Respondents who are retired (149.81) would significantly more likely do as such than the full time committed (210.33) or student (275.82). | Full-time      |
|                                                                                                                |                                                                                                        |                                                                                                                                            | Part-time      |
|                                                                                                                |                                                                                                        |                                                                                                                                            | Unemployed     |
|                                                                                                                |                                                                                                        |                                                                                                                                            | Student        |
|                                                                                                                |                                                                                                        |                                                                                                                                            | Retired        |
|                                                                                                                |                                                                                                        |                                                                                                                                            | Unable to work |

a. In Agreement/Likelihood, Blue colour for agreed/likely and Orange colour for disagreed/unlikely.

The findings were consistent regarding all types of the potential TREs and additionally were associated with age. Retired respondents, who were typically older tourists, were less likely to travel further away for a new destination, to travel longer distances and even more frequently, in comparison with full/part time committed, student or unemployed respondents. These findings support previous studies that investigate and find the differences of travel behaviour and activities at destinations between people who are active in the labour market and retirees (Blazey 1992; Collins and Tisdell 2002a; Alén et al. 2017). The time savings would not alter the fundamental behavioural patterns of people in the retired life stage for holiday or may have very little influence. In contrast, the full time committed and, particularly, students would be very interested in travelling further and longer distances more frequently and engaging in adventure sports and activities, suggesting the potential increase in energy consumption.

### 3) Gender and having children in the household and the potential TREs

A Mann-Whitney U test was performed to determine whether there were statistically significant differences in the level of agreement to the TRE statements, based on respondents' gender and whether they had children in the household or not. Table 5.23 shows the test outcomes.

Analysis of gender showed significant differences in responses to only two statements in relation to the TRE en-route and on-site. As found in the studies of Collins and Tisdell (2002b), Andreu et al. (2005), Pattersson and Schmöcker (2010), females would travel more frequently for holidays than males with the time savings, particularly for shorter distances. Similarly, Patterson (2006) suggests that females prefer to take more frequent short holidays, using accessible air transport.

While females were more likely to engage in all other activities at a destination by using the time savings (higher level of agreement), there was no statistically significant difference with males. However, the exception was in relation to adventure sports and activities that were apparently more appealing to men. As highlighted in literature (Sung 2004; Andreu et al. 2005; Marques et al. 2018), females are commonly found to seek relaxation and sightseeing at a destination more than males, whereas males enjoy more of adventurous and physical activities. It is important to acknowledge that such activities that would be more likely undertaken by males are often associated with more energy use and thus carbon impacts.

The time savings provide those with children with more opportunities to change their travel behaviour accordingly. In general, the holiday choices of families with pre-school children are largely determined by travel distance and time (Khoo-Lattimore et al. 2018). More specifically, families with young children tend to make different choices regarding their main transport to/from a destination, destinations to visit and activities to undertake, e.g. taking short distant travels, as found in previous studies (McKercher 2008; Dargay and Clark 2012; Davison and Ryley 2016). Therefore, extra free time would diversify travel choices that a family with children can make.

Tourists without children would have more flexibility in visiting more places during one trip utilising the time savings, although these may depend on the age of the children in the household as shown in Section 5.2.3. People with, especially young, children would prefer staying in one place during a trip where all key needs are met, e.g. child-friendly amenities and safety. Despite the time savings, tourists with young children were less likely to choose to travel to another place that requires additional travel. These findings were also underlined in the qualitative phase of this research (see Section 4.5 and 4.7)

Table 5.23 Gender and having children in the household and the potential TREs

| TRE statement                          | Outcome of Mann-Whitney U test                           | Result                          | Agreement/ Likelihood <sup>a</sup> |
|----------------------------------------|----------------------------------------------------------|---------------------------------|------------------------------------|
| Gender                                 |                                                          |                                 |                                    |
| TRE en-route                           |                                                          |                                 |                                    |
| 3.1c. I would travel shorter distances | U(N <sub>female</sub> =207, N <sub>male</sub> =197)=1487 | Females (229.13) agreed to this | Female                             |

|                                                                                                                |                                                                                                          |                                                                                                                                       |                  |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------|
| but more frequently for holiday.                                                                               | 7.500, z=-4.895, p<.001                                                                                  | statement significantly more than males (174.52).                                                                                     | Male             |
| TRE on-site                                                                                                    |                                                                                                          |                                                                                                                                       |                  |
| 3.3b. I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). | U(N <sub>female</sub> =207, N <sub>male</sub> =197)=2332 5.000, z=2.576, p=0.010                         | Males (217.40) would significantly more likely do than females (188.32).                                                              | Female           |
|                                                                                                                |                                                                                                          |                                                                                                                                       | Male             |
| Having children in the household                                                                               |                                                                                                          |                                                                                                                                       |                  |
| TRE en-route                                                                                                   |                                                                                                          |                                                                                                                                       |                  |
| 3.1g. The time savings offered by this technology would not change my current travel behaviour.                | U (N <sub>having children</sub> =162, N <sub>having no children</sub> =242) =22110.500, z=2.275, p=0.023 | Respondents with children (187.02) agreed to this statement significantly less than those without children (212.87) in the household. | With children    |
|                                                                                                                |                                                                                                          |                                                                                                                                       | Without children |
| TRE on-site                                                                                                    |                                                                                                          |                                                                                                                                       |                  |
| 3.3e. I would visit another place (i.e. a nearby town/city).                                                   | U (N <sub>having children</sub> =162, N <sub>having no children</sub> =242) =21767.000, z=1.975, p=0.048 | Respondents without children (211.45) would significantly more likely do as such than those with children (189.14) in the household.  | With children    |
|                                                                                                                |                                                                                                          |                                                                                                                                       | Without children |

a. In Agreement/Likelihood, Blue colour for agreed/likely and Orange colour for disagreed/unlikely.

### 5.5.2. TRE and holiday preferences

#### 1) Preferred travel distance for holiday and the potential TRE

Holiday preferences on travel distance were compared with relevant TRE statements in order to explore whether there were significant differences in responses to the statements (TRE destination choices and en-route).

A Kruskal-Wallis test was conducted between preferred holiday distance, i.e. domestic, short-haul, medium-haul and long-haul holidays, and the TRE statements. The test provided strong evidence to the difference between the mean ranks of at least one pair of preferred holiday distance groups in five statements of the potential TREs (Table 5.24). There was no significant difference in responses to the rest of TRE

statements with preferred holiday distance. Post-hoc Dunn's pairwise tests were subsequently carried out for the six pairs of preferred holiday distance groups, adjusted using the Bonferroni correction in order to further explore which groups were significantly different from each other.

A consistent trend was shown between the domestic holiday group and other groups. The respondents having an inclination for domestic holidays agreed to the TRE statements less than any other groups. The only exception was their agreement to the statement 'the time savings offered by this technology would not change my current travel behaviour', which was higher than agreements of other groups. This means those who prefer domestic holidays are less likely to show TREs, potentially not adding extra environmental burden. That is, those who prefer domestic holidays are not influenced by extra discretionary time but may have stronger determinants to take holidays within the country.

It is noteworthy that people preferring domestic holidays tended to repeat the visits to the same destination they had been previously. On the other hand, long-haul travels were mostly preferred by first-time tourists mostly, which connects with the higher probability of TRE en-route of the first visitors. These tourists tend to have extensive movement patterns during their trips to find new adventurous and exciting experiences as if it is a once in a lifetime opportunity.

For instance, Davison and Ryley (2016) in their qualitative study find that domestic holidays are preferred by most respondents due to several reasons including avoiding the stress of flying from the hassle (e.g. airport) and fear of travelling with children. Therefore, the time savings achieved by shorter air travel to a destination in Europe in the given scenario may not necessarily encourage them to change their current behaviour. In contrast, those who have preference for overseas holiday trips would have more probability to showcase the TRE. The other pairs were not statistically significantly different, unless otherwise specified in the table below.

Table 5.24 Preferred travel distance for holiday and the potential TRE

| TRE statement                                                                                                  | Outcome of Kruskal-Wallis test & Post-hoc test comparison groups                        | Result                                                                                                                                                                                           | Agreement <sup>ab</sup> |
|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| TRE with destination choices                                                                                   |                                                                                         |                                                                                                                                                                                                  |                         |
| 3.2d. I would go to a new destination which is further away.                                                   | X <sup>2</sup> (3)=29.286<br>p<0.001<br><br>D-L (p<0.001); D-S (p<0.001); D-M (p=0.009) | Respondents who preferred domestic holidays (156.40) agreed to this statement significantly less than those who preferred either long (218.36), short (221.36) or medium-haul (229.55) holidays. | D                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | S                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | M                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | L                       |
| 3.2e. I would travel more frequently regardless of the travel distance to destinations.                        | X <sup>2</sup> (3)=14.124<br>p=0.003<br><br>D-L (p=0.003)                               | Respondents who preferred domestic holidays (177.40) agreed to this statement significantly less than those who preferred long-haul (233.54) holidays.                                           | D                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | S                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | M                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | L                       |
| TRE en-route                                                                                                   |                                                                                         |                                                                                                                                                                                                  |                         |
| 3.1a. This technology would enable me to travel longer distances (outside Europe) for holiday.                 | X <sup>2</sup> (3)=42.252<br>p<0.001<br><br>D-L (p<0.001); D-S (p<0.001); D-M (p<0.001) | Respondents who preferred domestic holidays (149.69) agreed to this statement significantly less than those who preferred either long (213.55), short (225.64) or medium-haul (244.96) holidays. | D                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | S                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | M                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | L                       |
| 3.1b. This technology would enable me to travel longer distances (outside Europe) more frequently for holiday. | X <sup>2</sup> (3)=42.994<br>p<0.001<br><br>D-S (p<0.001); D-L (p<0.001); D-M (p=0.003) | Respondents who preferred domestic holidays (145.24) agreed to this statement significantly less than those who preferred either short (225.64), long (225.85) or medium-haul (227.11) holidays. | D                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | S                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | M                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | L                       |
| 3.1g. The time savings offered by this technology would not change my                                          | X <sup>2</sup> (3)=12.820<br>p=0.005<br><br>M-D (p=0.028); S-D (p=0.015)                | Respondents who preferred domestic holidays (230.12) agreed to this statement significantly more than those who preferred either medium (163.54) or short-haul (189.71) holidays.                | D                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | S                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | M                       |
|                                                                                                                |                                                                                         |                                                                                                                                                                                                  | L                       |

|                           |  |  |  |
|---------------------------|--|--|--|
| current travel behaviour. |  |  |  |
|---------------------------|--|--|--|

a. D: Domestic holidays, S: Short-haul holidays, M: Medium-haul holidays, L: Long-haul holidays

b. In Agreement, Blue colour for agreed and Orange colour for disagreed.

## 2) Preference for independent holidays and the potential TRE

A Mann-Whitney U test was performed in order to determine whether there were differences in responses to all TRE statements, based on respondents' preference of independent holidays: whether they would organise their trip independently or not. Four TRE statements were found to have significant differences (Table 5.25), while respondents in both groups showed agreement to the four statements below.

People favouring an organised tour were more likely to alter their behaviour indicating potential TRE with destination choices and en-route. However, they would not be interested in using the time for on-site activities. It is notable that the time savings were seen as opportunities for travelling further away rather than spending this saved time at the destination. The elements of package tours are attributed to specific sets of attractions, activities and varying experiences that reflect tourists' needs, which is one of the most important features for having preference for a package tour (Liao and Chuang 2020). In this regard, the extra time may be less relevant to those people as on-site experiences are likely to be already satisfied by choosing an organised trip.

Table 5.25 Preference for independent holidays and the potential TRE

| TRE statement                                                | Outcome of Mann-Whitney U test  | Result                                                                                                                                               | Agreement <sup>a</sup> |
|--------------------------------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| TRE with destination choices                                 |                                 |                                                                                                                                                      |                        |
| 3.2d. I would go to a new destination which is further away. | U=11920.500 , z=-2.737, p=0.006 | Respondents who preferred a package tour (229.82) agreed to this statement significantly more than those who preferred an independent tour (194.33). | Package trip           |
|                                                              |                                 |                                                                                                                                                      | Independent tour       |
| TRE en-route                                                 |                                 |                                                                                                                                                      |                        |
| 3.1a. This technology would                                  |                                 | Respondents who preferred a package tour (238.00)                                                                                                    | Package trip           |

|                                                                                                                |                                       |                                                                                                                                                        |                  |
|----------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| enable me to travel longer distances (outside Europe) for holiday.                                             | U=11160.000<br>, z=-3.656,<br>p<.001  | agreed to this statement significantly more than those who preferred an independent tour (191.88).                                                     | Independent tour |
| 3.1b. This technology would enable me to travel longer distances (outside Europe) more frequently for holiday. | U=11832.500<br>, z=-2.773,<br>p=0.006 | Respondents who preferred a package tour (230.77) agreed to this statement significantly more than those who preferred an independent tour (194.05).   | Package trip     |
|                                                                                                                |                                       |                                                                                                                                                        | Independent tour |
| TRE on-site                                                                                                    |                                       |                                                                                                                                                        |                  |
| 3.3c. I would just relax in/around my holiday accommodation.                                                   | U=11405.500<br>, z=-3.320,<br>p=0.001 | Respondents who preferred a package tour (235.36) would significantly more likely to do as such than those who preferred an independent tour (192.67). | Package trip     |
|                                                                                                                |                                       |                                                                                                                                                        | Independent tour |

a. In Agreement, Blue colour for agreed and Orange colour for disagreed.

### 5.5.3. TRE and availability (constraint)

#### 1) Time availability and the potential TRE

Time availability was measured by asking for agreement to three statements with use of the Likert scale, strongly disagree=1 to strongly agree=5. In this case, data on these statements were recoded to the new sets of variables, by using Transform command in SPSS. In other words, strongly disagree and disagree were combined into one as disagreed, and strongly agree and agree as agreed in order to remove neutral cases and then a Mann-Whitney U test was run only with decisive cases.

The Mann-Whitney U test was performed in order to determine whether there were differences in the level of agreement to the TRE statements, based on respondents' views on their time availability. Each time availability statement was tested against relevant TRE statements. In total, seven TRE statements were found to have a significant difference with either of the time availability questions (see Appendix 11).

As shown in the findings (Appendix 11), when people perceive that they do not have enough time for holiday travel or for desired activities at a destination, they would choose to use the time savings for more frequent travels or for extra activity

engagement at destinations, respectively. Particular examples were associated with adventure sports and extra visits to another place, and such activities often require additional travel (e.g. a pick-up van arranged to get to a canoeing site), which means the higher probability of increased energy consumption.

Similarly, when people prefer frequent short breaks to one long holiday due to the limited time budget, the time savings would offer flexibility in travel choices, such as the opportunities to choose long distant destinations, travel shorter distances more frequently, or even travel more frequently regardless of the distance to destinations (see Appendix 11 for the test results). The findings in relation to time availability indicate that people who generally feel restricted by time constraints are more likely to show potential TRE behaviour.

## **2) Financial availability: Household income and the potential TRE**

A Kruskal-Wallis test, including Post-hoc Dunn's test with Bonferroni correction to compare all pairs of groups, was performed to determine whether there were statistically significant differences in the level of agreement to each TRE statement, based on respondents' household income.

There were two TRE en-route statements that had significant differences in the level of agreement to, based on respondents' household income status (see Appendix 12). Post-hoc Dunn's test compared all pairs of groups and showed significant differences between Above £50,000 and the groups with less income, individually, against the two statements of TRE en-route. People earning £50,000 and above claimed they would take longer holiday trips (outside Europe) more frequently, but not for more frequent shorter distance travels, compared to the respondents with lower income. This suggests there is a positive tendency to travel for tourists with high income, i.e. more discretionary income, particularly relating to long distance trips that links to higher cost for travel (Alén et al. 2017). While there was a significant difference ( $X^2(5)=13.612$   $p=0.018$ ) in responses to the statement 'With the saved time, I would be happy to spend more time at the destination' between the income groups, no significant difference between any pair of groups was found following post-hoc Dunn's test.



#### **5.5.4. TRE and psychological values and time use patterns**

All items of psychological values and the time use patterns were categorised into seven factors following the PCA (see section 5.3). Figure 5.4 illustrates the predicted relationships between factors, representing psychological values or time use patterns, and the TRE. The links provided the rationale to run a correlation analysis to explore whether they are statistically related or not. Spearman's rank-order correlation tests were run to investigate the relationship of individual variables under each factor with the relevant TREs. All variables were measured using an ordinal (Likert) scale with five value-points, where: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly agree. Correlation is an effective size and thus the strength of the correlation is determined using the Evans' suggestion (1996) for the absolute  $r$  value:

- 0.00-0.19: Very weak;
- 0.20-0.39: Weak;
- 0.40-0.59: Moderate;
- 0.60-0.79: Strong;
- 0.80-1.00: Very strong.

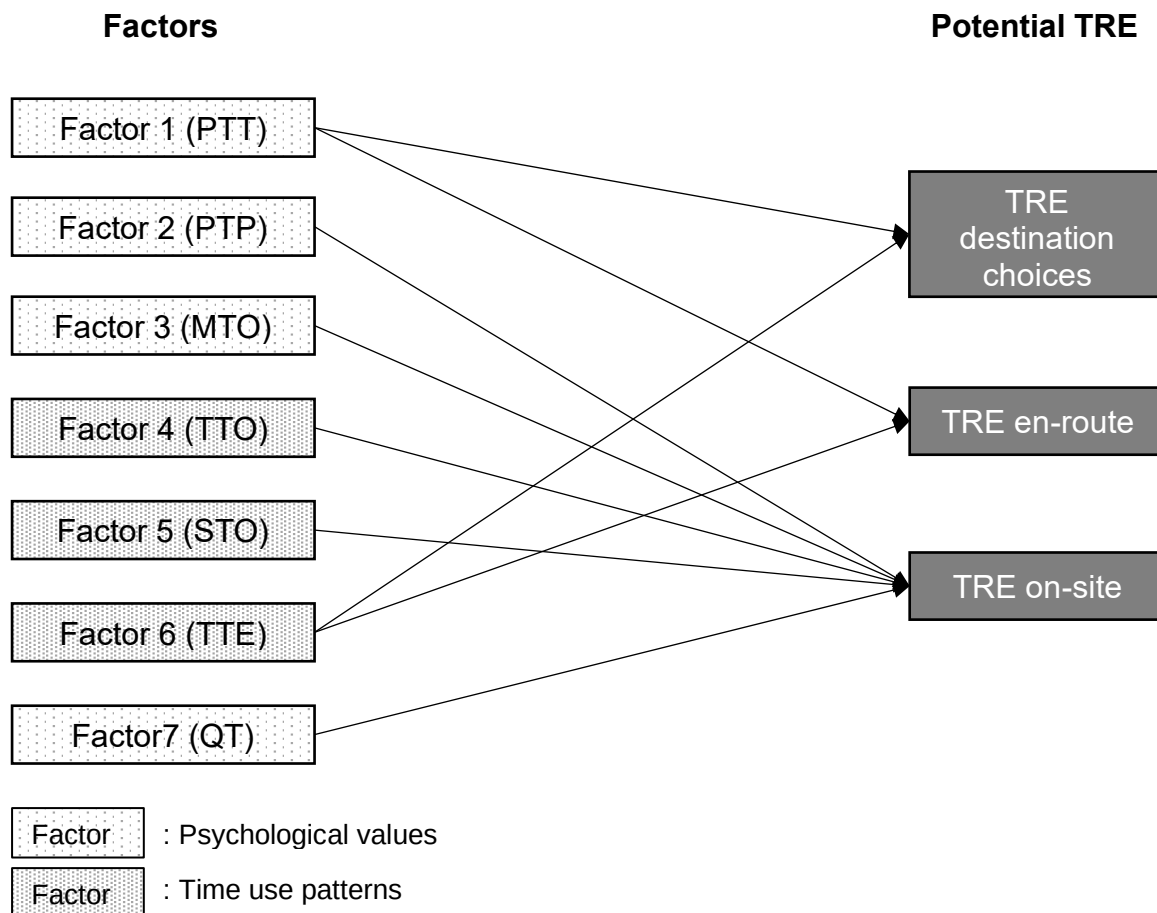


Figure 5.4 The predicted relationships between factors and the relevant TRE for test

### 1) Psychological value: Perception of travel time for holiday (PTT) and the potential TRE destination choices and en-route

There was evidence of a statistically significant bivariate association with the PTT psychological value on two statements of TRE destination choices and two of TRE en-route (absolute  $r$  values between 0.00-0.19) (see Appendix 13 for the test results). When tourists value travel en-route as an important holiday experience, the time savings from faster travel would be a trigger for them to increase their travel frequency regardless of travel distances to/from destinations, i.e. TRE. In contrast, holiday travel is often considered by other tourists as a practical, spatial movement to reach a destination where tourists focus on crossing the distance as quickly as possible for the desired experience at the destination (Maat et al. 2005). For such tourists, the time

savings are less likely to stimulate the RE directly linked to travelling, e.g. the time savings can be used for other activities rather than relating to travel.

## **2) Psychological value: Perception of time passing on holiday (PTP) and the potential TRE on-site**

The strength of the correlation coefficient indicates they were very weak to weak (absolute  $r$  values between 0.00-0.39) positive correlations. As the values of perception of time passing on holiday increase, the level of agreement to the associated statements rises. This suggests that as people think time passes faster on holiday, the time savings may relieve the time pressure and there would be increased probability for them to show behavioural changes in relation to the TRE on-site, as listed in Appendix 14.

## **3) Psychological value: Maximising limited time by doing many more on-site (MTO) and the potential TRE on-site**

All on-site TRE statements had a significant relationship (absolute  $r$  values between 0.00-0.39) with the psychological value, except for one statement 'I would go somewhere to eat/drink' (see Appendix 15 for the test results). While most correlation coefficient values were very weak or weak positive, the association between MTO and the responses to the statement 'I would just relax in/around my holiday accommodation' showed a very weak or weak negative correlation. The results indicate that the more people want to do things at a destination within the limited time, the more likely people would show behavioural changes in relation to the TRE at a destination by using the time savings, except for the activity of relaxing which implies the least environmental impact among the all examples.

## **4) Psychological value: Quality time on-site (QT) and the potential TRE on-site**

Those who were interested in spending quality time at a destination would be less interested in participating in adventure sports and activities (weak negative correlation, absolute  $r$  values between 0.00-0.39). It is notable that the only psychological value item that had a positive relationship with the activity of relaxing and eating/drinking was QT, indicating the lowest measurable environmental pressure that was

accompanied with the time savings in this scenario. This suggests that the more people agree that they enjoy quality time at the destination, the more likely they would use the time savings for relaxing or eating/drinking, but the less likely in engaging in adventure sports and activities (see Appendix 16 for the test results).

#### **5) Time use pattern: Time use and transport behaviour on-site (TTO) and the potential TRE on-site**

There were significant relationships (very weak, positive, absolute  $r$  values between 0.00-0.19) between the items under TTO and all on-site TRE statements except for the activity of relaxing, i.e. negative association (see Appendix 17). Whether people agree or not to 'I prefer having a vehicle (e.g. my own or rented car) for flexibility at the destination' was found not to have any significant association with any of the TRE on-site items. The results suggest that people who prefer walking/cycling or public transport at a destination are more interested in engaging in a variety of activities given the extra time gained to spend at a destination. It is worth noting that younger respondents agreed more to the below TTO statements, i.e. showing the greatest preference for walking/cycling and using public transport.

#### **6) Time use pattern: Scheduled time and temporal flexibility on-site (STO) and the potential TRE on-site**

Evidence of very weak or weak significant relationships (absolute  $r$  values between 0.00-0.39) between the time use pattern (2.3b) and most potential on-site TRE was found, except for the activity of relaxing, i.e. negative association (see Appendix 18 for the test results). A very weak relationship between the time use pattern (2.3c) and one TRE on-site item was found. This suggests that people who like to follow time schedules or plans on holiday are more likely to engage in different activities than those who do not, indicating the association with the potential TRE that would increase the on-site environmental impacts.

#### **7) Time use pattern: Time use and transport behaviour en-route (TTE) and the potential TRE destination choices and TRE en-route**

Very weak or weak positive associations (absolute  $r$  values between 0.00-0.39) were found, which indicates that people who normally prefer faster modes of transport to

arrive at a destination quickly would show the behavioural changes in relation to the destination choices and en-route behaviour, e.g. travel more frequently or further away (see Appendix 19 for the test results). The consistent results apply to those who have increased their travel frequency due to LCC airlines. A very weak negative association of 3.1g with both of the TTE statements indicates that people who prefer faster travels are less likely not change their current travel behaviour with the intervention of time savings from faster travel technology. In other words, they are more prone to the potential TREs.

#### **5.5.5. TRE in/around home**

Three statements were provided to respondents to see if the extra time saved from faster travel technology were to be used in/around home and examine how it would be used. The activities represented by each statement have implications for potential indirect TRE despite having relatively minor environmental implications.

- 1) I would spend this extra time for shopping to get better prepared for my holiday:  
Shopping
- 2) I would spend this extra time at home to rest and/or for personal care (e.g. bath): Resting/personal care
- 3) I would spend this extra time at home to do house work (e.g. laundry, cleaning, gardening): Housework

Overall, there was weak agreement in responses to these statements, compared to other TRE statements. This indicates that the potential TREs are more likely associated with behavioural changes throughout a holiday journey, or directly related activities to a holiday, i.e. destination choices, on-site, en-route. Given the option to spend the additional discretionary time, saved from a holiday travel, in/around home, how the respondents would use it seemed to reflect their daily routines. That is, what activities they would partake may depend on their existing lifestyle, family culture, other factors that are typically related to their home activities such as social networks and health conditions.

This is in consistent with the particular statement for TRE destination choices (3.2b. I would still go to the same destination, but use the time saved from travel to do something in/around home before departure and after the holiday), to which respondents showed a low level of agreement overall.

Among the activities given, the respondents were most likely to spend the extra time to rest and/or for personal care (e.g. bath) at home (52% agreement) than other activities offered, i.e. shopping and housework.

Socio-demographic factors were tested (either Mann-Whitney U or Kruskal-Wallis test) against these statements to explore the impact of those factors on the occurrence of potential TREs, which addresses behavioural changes and thus implications for the potential TREs. Table 5.26 shows the significant differences between the variables and the group which showed the greatest agreement to each TRE statement (see Appendix 20 for the detailed results).

Table 5.26 Test summary of socio-demographic factors and TRE in/around home

|                               |         | <b>Age</b> | <b>Gender</b> | <b>Current employment statement</b> | <b>Household income</b> | <b>Having children</b> |
|-------------------------------|---------|------------|---------------|-------------------------------------|-------------------------|------------------------|
| <b>Shopping</b>               | p-value | 0.006      | 0.001         | 0.002                               | -                       | -                      |
|                               | Group   | 18-27*     | Female*       | Student*                            | Above £50,000           | With children          |
| <b>Resting/ personal care</b> | p-value | 0.041      | 0.045         | 0.033                               | -                       | -                      |
|                               | Group   | 18-27      | Female*       | Student*                            | £30,001-£40,000         | With children          |
| <b>Housework</b>              | p-value | 0.001      | 0.001         | -                                   | -                       | -                      |
|                               | Group   | 28-37*     | Female*       | Student                             | Below £12,500           | With children          |

Note1: 'p-value' indicated where significant differences between all pairs resulted from a Kruskal-Wallis or Mann-Whitney U test

Note2: 'Group' identifies that a group within the socio-demographic factor that showed the greatest agreement to the corresponding TRE item.

Note3: item\* denotes the significant difference of the group with an(other) group within the category

Overall, the older tourists were less likely to engage in physical in/around home activities that required the use of home appliances and travel compared to their younger counterparts. This indicates the association of the potential TREs in/around

home with age, suggesting that the younger a person is, the more energy consuming in/around home activities they would engage in with the time savings.

In terms of the differences between the gender groups, the Mann-Whitney U test results showed that females would do more of all in/around home activities listed, with the time savings, compared to males. The greater differences between the gender groups were in shopping and housework. This is similar to the results of a time use survey (Eurostat 2019) in which females in the UK spend more time than men on household upkeep activities and shopping. The same results can also be found in other cultural and societal contexts such as in China where females are found to spend more time on housework than their male counterparts (Wei et al. 2018). With the time savings given, females would still do what they typically do in/around home, indicating more probability of the occurrence of potential, yet indirect, TREs in/around home compared to males.

The results of a Kruskal-Wallis test showed that people who typically have less extra time, i.e. student or full-time committed, were more likely to spend the given extra time on shopping, compared to other groups of people, i.e. retired or part-time committed. Students showed more interest in spending the additional time on rest/personal care than retired or full-time committed.

There was no significant difference found in responses to the statements between various income groups and between those who had children in the household and those who did not. This suggests that household income and having children at home are not associated with the potential TRE in/around home given extra time saved from faster travel technology.

Spearman's rank-order correlation tests were run to investigate the relationship of TRE in/around home statements with psychological values (PPT, PTP, MTO, QT) and time use patterns (TTO, STO, TTE) factors. Very weak to weak (absolute  $r$  values between 0.00-0.39) correlations were found with items under PPT, PTP, MTO, STO and TTE. In particular, all MTO and STO items were shown to have correlations with the statement related to shopping where all relationships were positive except for the statement 2.3c. When on holiday, I have flexibility of changing schedules and plans as I want (Appendix 21 for the test results).

### 5.5.6. TRE and clusters

A series of Kruskal-Wallis tests was performed to explore the differences in responses to 17 TRE statements between cluster groups. Following post-hoc Dunn tests provided evidence of statistically significant differences between the mean ranks of the two pairs of cluster groups on most statements of the potential TRE destination choices, en-route and on-site except for five statements (see Table 5.27).

Table 5.27 The potential TREs by cluster

| TRE statement                                                                                                                                             | Outcome of Kruskal-Wallis test & Post-hoc test comparison groups                                         | Result                                                                                                           | Agreement (%)                |                          |                                |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------------|--------------------------------|---------|
|                                                                                                                                                           |                                                                                                          |                                                                                                                  | Cluster 1: Travel time lover | Cluster 2: Busy explorer | Cluster 3: Quality time seeker | Overall |
| TRE destination choices                                                                                                                                   |                                                                                                          |                                                                                                                  |                              |                          |                                |         |
| 3.2a. I would still go to the same destination and use the time saved from travel to do something at the destination.                                     | -                                                                                                        | Not significant                                                                                                  | 83.6%                        | 73.5%                    | 74.6%                          | 78.0%   |
| 3.2b. I would still go to the same destination, but use the time saved from travel to do something in/around home before departure and after the holiday. | -                                                                                                        |                                                                                                                  | 21.9%                        | 23.1%                    | 19.1%                          | 21.3%   |
| 3.2c. I would travel to the same destination but more frequently.                                                                                         | X <sup>2</sup> (2)=10.162<br>p=0.006<br><br>Cluster 3 with 2 (p=0.044)<br><br>Cluster 3 with 1 (p=0.008) | Cluster 3 (Mean rank=176.44) agreed to this statement significantly less than Cluster 2 (211.61) and 1 (216.16). | 29.1%                        | 31.9%                    | 18.3%                          | 26.5%   |



|                                                                                                                |                                                                                                  |                                                                                                                  |       |       |       |       |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|
| 3.2d. I would go to a new destination which is further away.                                                   | $X^2(2)=8.164$<br>$p=0.017$<br>Cluster 3 with 2 ( $p=0.013$ )                                    | Cluster 3 (Mean rank=183.63) agreed to this statement significantly less than Cluster 2 (224.24).                | 64.2% | 69.0% | 53.2% | 62.1% |
| 3.2e. I would travel more frequently regardless of the travel distance to destinations.                        | $X^2(2)=11.336$<br>$p=0.003$<br>Cluster 3 with 1 ( $p=0.020$ )<br>Cluster 3 with 2 ( $p=0.006$ ) | Cluster 3 (Mean rank=175.21) agreed to this statement significantly less than 1 (211.18) and Cluster 2 (220.24). | 34.5% | 33.6% | 19.9% | 29.7% |
| TRE en-route                                                                                                   |                                                                                                  |                                                                                                                  |       |       |       |       |
| 3.1a. This technology would enable me to travel longer distances (outside Europe) for holiday.                 | $X^2(2)=12.099$<br>$p=0.002$<br>Cluster 3 with 2 ( $p=0.002$ )<br>Cluster 1 with 2 ( $p=0.025$ ) | Cluster 2 (Mean rank=230.99) agreed to this statement significantly more than Cluster 3 (184.57) and 1 (196.68). | 77.6% | 82.3% | 72.3% | 77.2% |
| 3.1b. This technology would enable me to travel longer distances (outside Europe) more frequently for holiday. | $X^2(2)=17.410$<br>$p<0.001$<br>Cluster 3 with 2 ( $p<0.001$ )                                   | Cluster 3 (Mean rank=172.77) agreed to this statement significantly less than Cluster 2 (233.24).                | 58.8% | 67.3% | 47.6% | 57.6% |
| 3.1c. I would travel shorter distances but more frequently for holiday.                                        | -                                                                                                | Not significant                                                                                                  | 39.4% | 34.5% | 32.5% | 35.9% |

|                                                                                                 |                                                                                                  |                                                                                                                  |                |       |       |       |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------|-------|-------|-------|
| 3.1d. I would travel more frequently for holidays in general.                                   | $X^2(2)=13.198$<br>$p=0.001$<br>Cluster 3 with 1 ( $p=0.044$ )<br>Cluster 3 with 2 ( $p=0.001$ ) | Cluster 3 (Mean rank=175.00) agreed to this statement significantly less than Cluster 1 (207.11) and 2 (226.43). | 55.1%          | 61.1% | 42.0% | 52.7% |
| 3.1g. The time savings offered by this technology would not change my current travel behaviour. | $X^2(2)=6.026$<br>$p=0.049$                                                                      | No significant difference between pairs of clusters                                                              | 26.0%          | 16.9% | 24.6% | 23.1% |
| TRE on-site                                                                                     |                                                                                                  |                                                                                                                  |                |       |       |       |
| 3.1e. With the saved time, I would be happy to spend more time at the destination.              | -                                                                                                | Not significant                                                                                                  | 87.9%          | 87.6% | 84.1% | 86.7% |
| 3.1f. I would engage in more activities/ attractions at the destination.                        | $X^2(2)=47.050$<br>$p<0.001$<br>Cluster 3 with 1 ( $p<0.001$ )<br>Cluster 3 with 2 ( $p<0.001$ ) | Cluster 3 (Mean rank=148.56) agreed to this statement significantly less than Cluster 1 (218.00) and 2 (240.01). | 67.9%          | 76.1% | 38.0% | 60.9% |
|                                                                                                 |                                                                                                  |                                                                                                                  | Likelihood (%) |       |       |       |
| 3.3a. I would go sightseeing around the place.                                                  | $X^2(2)=15.767$<br>$p<0.001$<br>Cluster 3 with 1 ( $p=0.006$ )<br>Cluster 3 with 2 ( $p=0.001$ ) | Cluster 3 (Mean rank=173.35) agreed to this statement significantly less than Cluster 1 (210.91) and 2 (222.73). | 82.4%          | 86.7% | 69.0% | 79.4% |

|                                                                                                                |                                                                                                          |                                                                                                                  |       |       |       |       |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|
| 3.3b. I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). | X <sup>2</sup> (2)=26.432<br>p<0.001<br><br>Cluster 3 with 2 (p<0.001)<br><br>Cluster 3 with 1 (p<0.001) | Cluster 3 (Mean rank=159.40) agreed to this statement significantly less than Cluster 2 (221.96) and 1 (222.08). | 35.2% | 35.3% | 15.9% | 29.2% |
| 3.3c. I would just relax in/around my holiday accommodation.                                                   | X <sup>2</sup> (2)=14.720<br>p=0.001<br><br>Cluster 2 with 3 (p=0.004)<br><br>Cluster 1 with 3 (p=0.002) | Cluster 3 (Mean rank=233.33) agreed to this statement significantly more than Cluster 2 (187.70) and 1 (189.09). | 55.7% | 56.7% | 75.3% | 62.1% |
| 3.3d. I would go somewhere to eat/drink.                                                                       | -                                                                                                        | Not significant                                                                                                  | 74.6% | 70.8% | 75.4% | 73.8% |
| 3.3e. I would visit another place (i.e. a nearby town/city).                                                   | X <sup>2</sup> (2)=23.692<br>p<0.001<br><br>Cluster 3 with 1 (p=0.001)<br><br>Cluster 3 with 2 (p<0.001) | Cluster 3 (Mean rank=164.33) agreed to this statement significantly less than Cluster 1 (211.74) and 2 (231.58). | 56.3% | 66.4% | 40.5% | 54.2% |

Note1: Coloured value is the highest value across the clusters

Overall, the 'Busy explorers' showed the greatest level of agreement for most statements, which indicates that they are most prone to potential TREs among the cluster groups, closely followed by the 'Travel time lovers'. The 'Busy explorers' featured prominently in the self-recognition for their behavioural changes in holiday travels among the cluster groups. The level of carbon emissions can increase the most in relation to the TRE activities undertaken by this cluster group compared to other cluster groups.

Reflecting on the personal characteristics of these two cluster groups, the 'Busy explorer' and 'Travel time lover', consistent results were found in line with the findings

of previous research that young tourists are willing to seek active adventures and to discover new places and experiences as a key element of their travel motives (Xu et al. 2009). In other words, the 'Busy explorers' and 'Travel time lovers' would be more interested in spending the time savings on maximising their holidays for novel and adventurous experiences in relation to destination choices, en-route and on-site, e.g. travelling further away, travelling more frequently, or doing more things that relate to physical activities and travels at a destination.

In particular, as the 'Busy explorers' felt the most that they did not have enough time for holidays in general and could not manage everything they wanted to do at destinations, they may view the time savings as an opportunity for doing some extra activities. That is, perception of time availability notably influences tourist activities and movement as noted by McKercher and Lau (2008). In contrast, the 'Quality time seekers' showed weaker opinions on almost all TRE statements. Meanwhile, their greatest agreements were displayed in the two similar statements relating to TRE on-site: i.e. to relax around their accommodation or to go somewhere to eat/drink, with limited implications for increased in energy consumption.

Rest, relaxation and comfort are the core motives of seniors' travel among many other factors (Boksberger and Laesser 2009). Considering that the 'Quality time seeker' group is represented by the older, retired tourists, the opportunities to take part in relaxing activities in the given destination (a Mediterranean destination in the scenario considered) are primarily appealing to the 'Quality time seekers', which resembles the 'Entertained' group in the study of Nimord and Rotem (2010), despite the intervention of the time savings. Their typical motivation for holiday trips tends to be translated into their travel behaviour and therefore the 'Quality time seekers' would rather spend any extra time saved to continuously seek leisure and quality time at a destination for the sake of improving mental and physical wellbeing (Otoo and Kim 2020).

In addition, they feel that they, in general, have enough time for holiday travels and all desired activities at a destination. The extra time saved may not necessarily encourage them to engage in activities that are significantly different from what they typically do. This connects with the preference of the 'Quality time seekers' for an independent tour and repeat visits to familiar destinations, which may determine the intensity of activities and experiences. Previous studies (Jang and Feng 2007; Li et al.

2008; Antón et al. 2017) find that repeat visitors tend to have very specific plans for on-site activities and thus travel less within the destination. Conversely, first time visitors are inclined to travel greater distance to partake in a wide range of activities (e.g. visit all popular tourist attractions). Rather than the ‘Quality time seekers’, i.e. likely to be repeat visitors, the ‘Travel time lovers’ and ‘Busy explorers’, i.e. likely to be first visitors, would accordingly be more prone to the potential TRE.

Meanwhile, a Kruskal Wallis test was performed to explore differences between clusters in response to TRE in/around home statements with Post-hoc Dunn test with Bonferroni adjustment. The test results showed that the ‘Busy explorers’ would more likely spend the time savings for shopping than other clusters. The other pairs of cluster groups for other statements, i.e. resting/personal care and housework, were not statistically significantly different (see Appendix 22).

#### 5.5.7. Willingness to pay (WTP) and the new travel context

While there are key factors that can significantly influence the TRE occurrence, it is important to underline the role of the new travel context (the travel context where a tourist choose a faster travel option) in the TRE probability. Table 5.28 shows a list of variables under the new travel context, which are important determinants of travel behaviour of tourists, as claimed by Becken (2011). The most important factors were found to be the cost of faster travel and the length of stay at a destination.

Table 5.28 New travel context

| Influential factor                      | Mean <sup>a</sup> |
|-----------------------------------------|-------------------|
| Cost of faster travel                   | 4.33              |
| Length of stay                          | 4.02              |
| What the destination offers to tourists | 3.93              |
| The mode of transport                   | 3.89              |
| Whom I travel with                      | 3.83              |

a. Higher Mean value indicates stronger agreement (Strongly Disagree=1 and Strongly Agree=5).

Not surprisingly, how to use the time savings from faster travel technology would depend on how much of extra costs tourists will be charged for. A large number of respondents were willing to pay extra (82.2%). One third of the total respondents were willing to pay up to 20% of the original fare, whereas another one third – between 20%

and 40%. Approximately 14% of the total respondents would pay an extra of 40% and 100% for faster travel.

Those who were willing to pay extra for more than 80% of the original fare, in addition to the original fare, were mostly represented by the old age, female, full-time committed, part-time committed or retired, without children in their household, high income group. In particular, approximately 92% of the respondents with income of £50,000 and above were willing to pay extra for travel up to more than 100% in addition to the original fare. Those who preferred domestic holidays, sightseeing trips, independent tours were willing to pay extra for faster travel more likely than others. In relation to time availability, respondents who claimed they did not have enough time for holiday travel or to manage all desired activities at a destination were more likely willing to pay extra costs that may be required for faster travel.

A series of Pearson Chi-Square tests were performed to investigate whether each variable of socio-demographic characteristics and holiday preferences was associated with the WTP. The test results revealed there was no significant relationship between each variable and WTP. The only exceptions where there was a significant association with the WTP were found in holiday distance preference ( $X^2(18)=39.084$ ,  $p=0.003$ ) and favourite type of holiday ( $X^2(30)=49.021$ ,  $p=0.016$ ).

When it comes to using the WTP approach, it is important to acknowledge that respondents may overestimate their WTP in a hypothetical setting and, thus, show inconsistency in their actual economic behaviour (Lisa and Gallet 2001). In other words, people would not pay as much as they claimed they were willing to pay. Hence, WTP in this research should be viewed as a reflection of tourists' perceived incentive value of faster travel rather than the absolute, actual amount they would pay for it, as noted by Huang et al. (2018).

A Kruskal-Wallis test results showed no significant differences ( $p>0.05$ ) between the cluster groups in relation to each factor (Table 5.27) when considering the faster travel option. There was no difference between the groups of employment status, having children or not, preferred holiday distances and favourite type of holiday (Kruskal-Wallis or Mann-Whitney U test,  $p>0.05$ ). For one factor, the cost of faster travel, a significant difference was found between a pair of groups in age (28-37 and 38-47,

$p=0.043$ ) and choices of an independent holiday (independent tour and package tour,  $p=0.036$ ). People who were in the age group of 28-37 and preferred a package tour considered the cost of faster travel an important factor more in comparison with their counterparts. The responses to each factor were statistically significantly different between the gender groups (Mann-Whitney U test,  $p<0.05$ ), where women perceived the factors given in Table 5.28 were important more compared to men.

## **5.6. Summary**

All identified factors were tested against relevant TRE items to examine the implications of each factor for the potential TRE relating to destination choices, en-route and on-site.

Socio-demographic characteristics are found to be closely related to the occurrence of all of the potential TREs. Younger people are more prone to potential TREs, compared to people in the older age group. Females are more likely to engage in the given on-site activities/attractions, excluding adventure sports and to travel shorter distances more frequently, compared to males. Full/part time committed people or students are more likely to change their behaviour in all TRE aspects than those who retired. Having children is a factor that influences on changes of current travel behaviour. Regarding the TRE on-site, presence of children restricts visiting another city using time savings.

In terms of the financial availability (or constraint), the highest income group would travel longer distances more frequently, while the lower income group would travel shorter distances more frequently. Longer distance trips mean higher travel costs, which not only links to the discretionary income but also WTP where the highest income group were willing to pay extra for faster travel.

The more people perceive that they lack time for holiday trips and activities, the more likely they are to show the potential TRE in different forms. People who perceive that they do not have enough time for holiday or for all desired activities at a destination are more prone to travel more frequently or engage in more activities at a destination, such as adventure sports/activities or extra visit to another place, respectively. People who prefer taking frequent short breaks than a long holiday are likely to travel more

often, regardless of the travel distance to destinations, and to travel further away. The time savings enable them to feel less of the time limit so that they are more flexible in choosing long distant destinations for longer periods.

The findings linking to the TRE in/around home are not very different. There are associations of the potential TREs in/around home with age and gender. Younger people and females are more prone to the potential TREs in/around home. People who have less free time in general, i.e. student or full-time committed, are more likely to spend the given extra time for shopping.

People preferring domestic holidays are less likely to show TREs potentially, indicating that they are least likely to change their current travel behaviour. Those who prefer a package tour are more likely to change their behaviour, in relation to the potential TRE with destination choices and en-route rather than the TRE on-site. Respondents, who tend to visit a new destination, are more likely to change their travel behaviour than those who do not, by choosing to travel further away.

Enjoyment of travel time is positively linked to the scope for more frequent travel. When people think time passes faster on holiday, they are more likely to show behavioural changes in relation to most of the TRE on-site activities. People who want to engage in as many destination-based activities as possible within the limited time are more likely to show behavioural changes on-site with the potential of TRE to occur. The more people agree that they enjoy quality time at the destination, the more likely they would like to use the time savings for relaxing or eating/drinking.

When people prefer walking/cycling or use public transport and/or tend to follow time schedules or plans on holiday, they are more likely to engage in diverse activities on-site using the time saved. Using the fastest mode of transport or travel more frequently due to LCC airlines can induce people to travel more frequently or further away, and to change their current travel behaviour with the intervention of time savings from faster travel technology.

From the cluster analysis, three clusters were identified: Travel time lover, Busy explorer, Quality time seeker. The Busy explorers (Cluster 2) who perceive travel time as a cost and tend to pack as many experiences and activities as possible in one holiday trip are most likely to show the potential TRE in most aspects, followed by the



Travel time lovers (Cluster 1) who enjoy travel time. These two groups have similar personal characteristics. The Quality time lover (Cluster 3) who desires quality time on holiday and prefers domestic holidays is least likely to show behavioural changes (TREs) that have negative environmental implications.

When considering a faster travel option, its cost is the most important factor. While the majority of respondents are willing to pay extra in addition to the original fare, apparent features are found regarding who are willing to pay more. Such tourists are primarily older aged, women, full-time committed, part-time committed or retired, without children in their household, high income group. In addition, they prefer domestic holidays, sightseeing trips and independent tours, and do not think they have enough time for holiday travel or to manage all desired activities at a destination.

## **Chapter 6. Conclusion and implications**

### **6.1. Introduction**

This final chapter consists of six main sections following an introduction. The chapter begins with presenting the refined conceptual framework along with a summary of the influential factors on the potential TREs which was developed based on the research findings. The following section revisits the main objectives of the study. Section four and five outline the contribution of the current study to both knowledge and practice, respectively. A section discussing the limitations of the study follows. The final section makes recommendations for future research.

### **6.2. The conceptual framework of the occurrence of the potential TRE**

The influential drivers and factors in relation to the potential TRE were initially identified from previous studies that have explored the RE with respect to the time dimension, in the tourism literature and beyond. The interviews undertaken in Phase I of the primary data collection and analysis identified the perception and use of time in a range of aspects. The more salient factors as well as the detailed potential TREs were identified in the analysis of the interviews and listed to devise a list of factors to be tested in the questionnaire survey.

Figure 6.1 summarises what factors have been found to have an impact on the relevant TRE occurrence. Socio-demographic characteristics are discovered to be salient factors for most of the potential TREs. Availability of time and money and Holiday preference are the strong factors for the relevant TRE occurrences. Time related categories, i.e. psychological values and the time use patterns, contain factors that are closely related to the different types of the TRE.

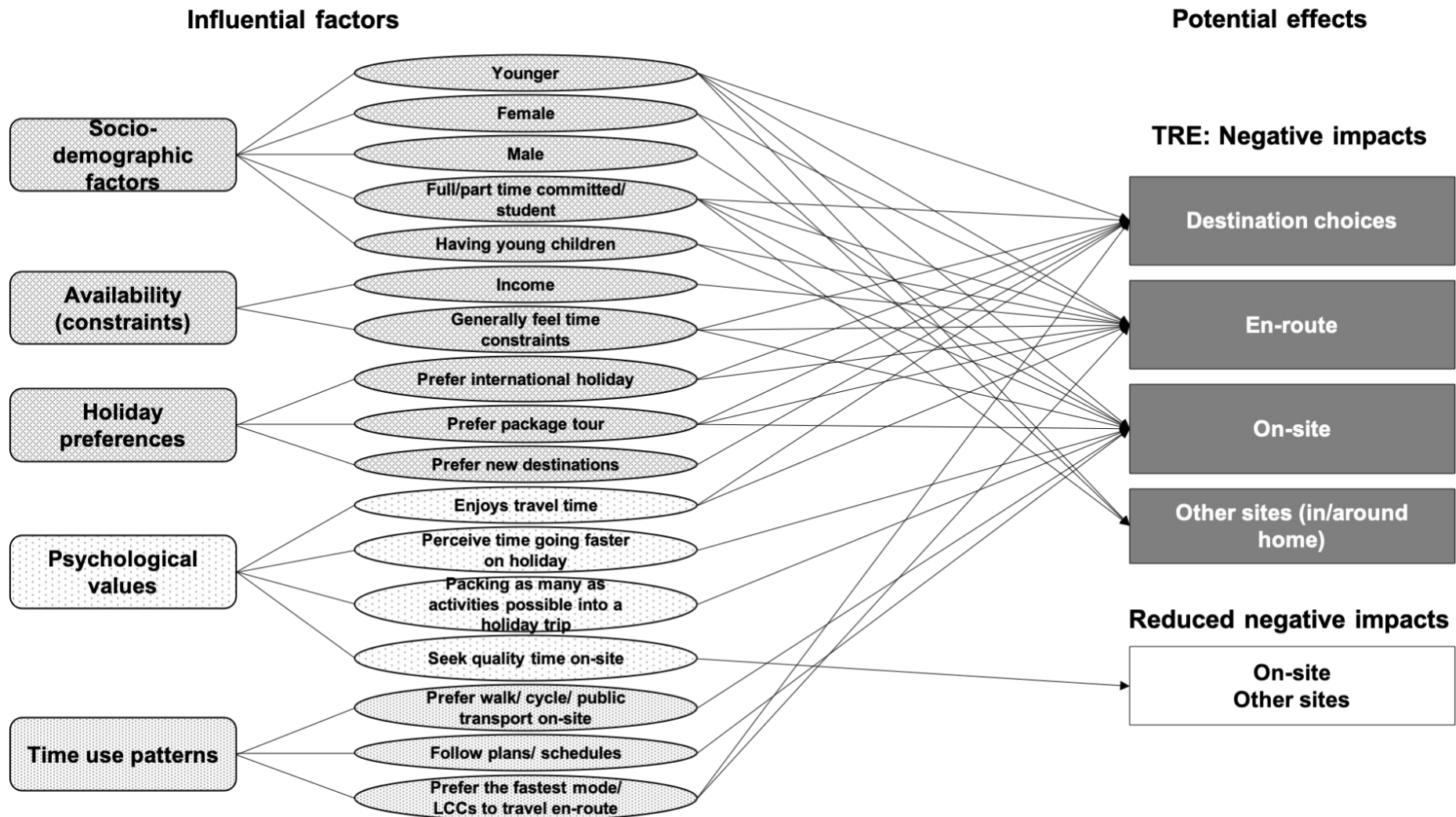


Figure 6.1 Summary of influential factors on the potential TREs

While accurate estimates for the magnitude of each factor influencing a tourist are not analysed in this study, Figure 6.1 indicates that the elements under socio-demographic characteristics are closely related with the TRE occurrence bridging all aspects, i.e. destination choices, en-route, on-site. This also applies to the TRE occurrence in/around home, which implies that socio-demographic factors are relevant to the TRE occurrence outside of the tourism context, i.e. transferring the time savings en-route of a holiday to other contexts indicating indirectly occurring environmental impacts. Figure 6.1 enables understanding of which factors have a close relationship with various forms of the potential TREs. For example, psychological values and time use patterns can significantly influence the potential TRE on-site.

Based on the findings from Phase I and II of the study, the conceptual framework has been refined including those factors as illustrated in Figure 6.2. The key changes made to the initial conceptual framework following the empirical investigation are coloured in blue in Figure 6.2. The key refinements include that 'other factors' under influential factors in the initial framework (see Figure 2.2 in Chapter 2) have been specified as 'time use patterns' and 'socio-demographic factors'. A group of factors (trip purpose, travel companions, type of destination) have been categorised under an umbrella factor, 'holiday preferences'. In this study, time efficiency gains associated with en-route travel have been primarily analysed and thus highlighted (yellow colour) in the refined framework as an anticipated driver in Figure 6.2. While the refined framework focuses on the TRE caused by en-route time savings, other drivers should not be neglected. Behaviour of a tourist is driven by the effects of time efficiency and a group of influential factors play a role in determining behavioural changes in tourist consumption, which can be defined as the TRE. Potential negative TREs have been refined by being divided into four TRE forms: destination choices, en-route, on-site and other sites (in/around home). A range of forms of the TRE have implications for the environmental impacts such as increases in energy consumption and GHG emissions.

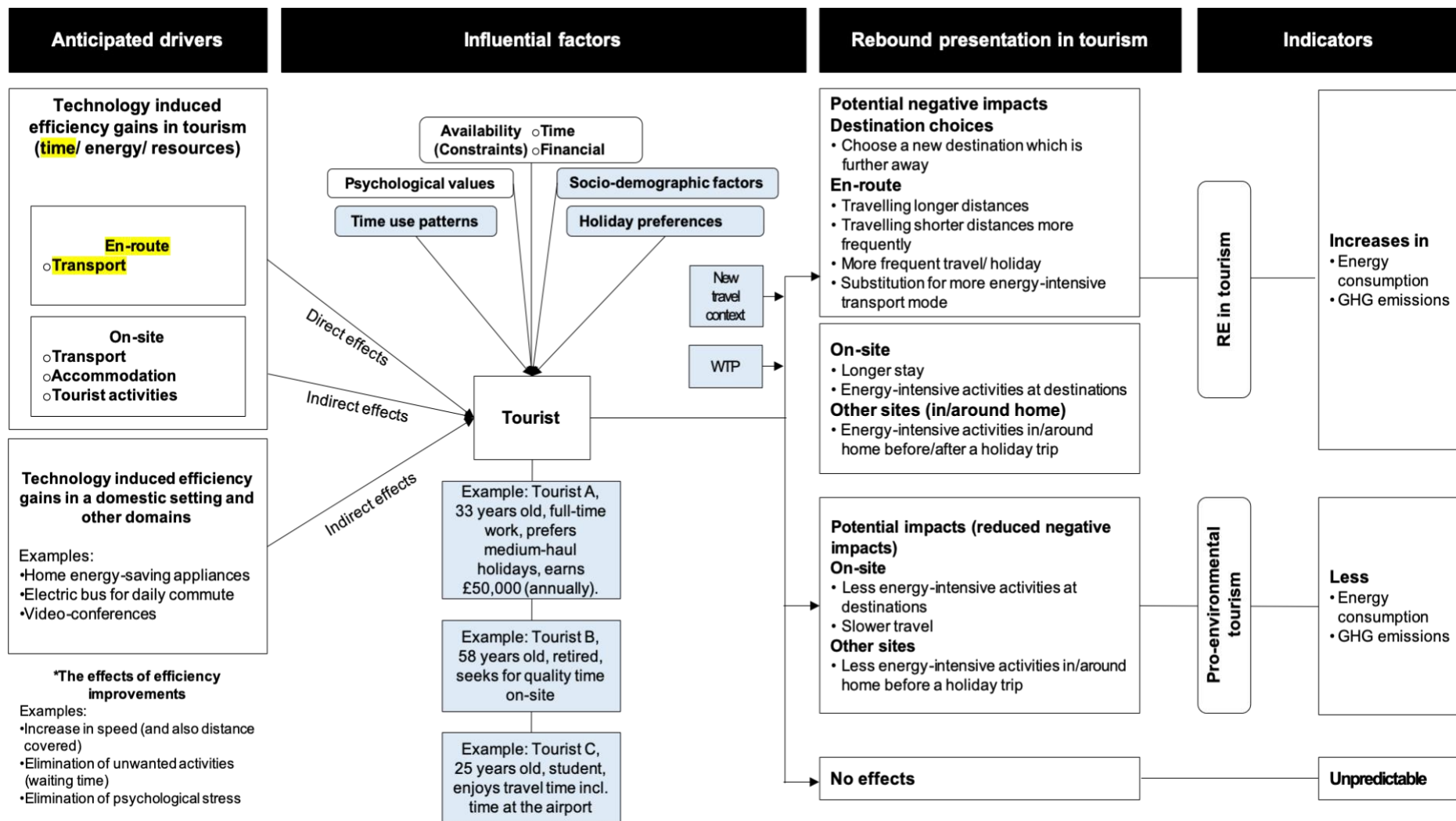


Figure 6.2 The refined conceptual framework

The study findings suggest that the travel behaviour of people that enjoy travelling and do not mind taking a long time to get to a destination (psychological value) does not translate into potential effects that are less energy intense. This was not the same as expected in the initial framework (see Figure 2.2 in Chapter 2). Rather, these people may indeed hold many types of TRE destination choices and en-route, such as travel longer distances for holiday and more frequently, regardless of their anticipated behaviour on-site. However, this would be also adjusted depending on other influential factors.

The advanced conceptual framework holds some key examples represented by Tourist A, B and C. The examples reflect main tourist segments in terms of their socio-demographic characteristics and holiday preferences to demonstrate the effects of the TRE. Considering the findings of the study, different categories of tourists would potentially show different behavioural changes (i.e. TRE) in their holiday trip. Tourist A and C are prone to the TRE in all aspects based on their age, employment status, income (where applicable) and holiday preferences, while Tourist B is least likely to show behavioural changes in relation to travel or destination activities, with possibilities of displaying pro-environmental tourism behaviour. As the financial cost plays an important role in relation to travel en-route, the time savings from faster travel would provide more opportunities to Tourist A (who has a regular income) than Tourist C (who does not have a regular income). This estimate is reflected on the study findings concerning tourists' WTP extra for the time savings. However, these examples are provided in the fixed and controlled setting, but behavioural changes caused by the time savings may occur depending on a variety of other reasons and the types of the TRE occurring may differ (see Section 5.5.7).

### **6.3. Review of the objectives**

The study has been conducted throughout aiming to achieve its main objectives. The seven objectives are reviewed in order.

**Objective 1:** *To identify a) energy and time saving technological improvements in the tourism subsectors particularly in relation to tourist transport and b) the perception of tourists on these improvements*

Energy and time saving technological improvements were identified in the three subsectors of the tourism industry, i.e. tourist transport, tourist accommodation and activities, yet with a particular focus on the matter of tourist transport, following a critical literature review.

***Objective 2:*** *To conceptualise the potential RE, integrating the TRE, in tourism by categorising its key dimensions and drivers of the RE*

The (T)RE were critically reviewed in the traditional RE studies such as energy economics as well as in tourism studies. Accordingly, the key dimensions and drivers of the (T)RE were identified, from which a conceptual framework of the potential (T)RE was developed (Figure 2.2 in Chapter 2) in the context of tourism. The conceptual framework was subsequently refined based on the findings linking to Objective 7.

***Objective 3:*** *To explore environmental attitudes and behaviour of tourists*

The study has revealed that tourists tend to be aware of their environmental impacts and to have pro-environmental attitudes in a holiday context. Meanwhile, tourists are more likely to blame others for the environmental damages from tourism than to reflect on their own behaviour. Tourists do not generally link their own travel behaviour to the negative environmental impacts. Although they are generally aware of tourist transport, particularly airplanes, being a significant contributor to the GHG emissions related to tourism, none of the study participants claimed that they would change their current travel behaviour to reduce their environmental impacts, supporting the findings of previous research, for example, Hares et al. (2010); Miller et al. (2010); Alcock et al. (2017), which reports dissonance between tourists' awareness, attitudes and actual pro-environmental behaviour regarding air travel.

***Objective 4:*** *To examine tourist perception and attitudes towards time in a holiday context*

There was a variety of views on and attitudes towards time passage whilst on holiday and travel time en-route for holiday. While tourists' views and attitudes regarding the time dimension could not necessarily be defined in a single term, the study has identified the various factors affecting such views and attitudes reflecting upon different stages of a holiday trip, including en-route and on-site. The findings have

demonstrated that the perceived speed of time passage on holiday varies depending on tourist experiences during a holiday trip, which is comparable to their everyday life. The key factors that influence people's perception of time passing have been identified in this study, which include unfamiliarity, usual demands, emotions/time awareness and lack of time pressure. The study has revealed that tourists' perception of and attitudes towards time en-route are closely related to the experiences and environment as well as emotions incorporated in the travel time. Socio-demographic characteristics, most notably age, employment status and having children, were found to play a significant role in influencing the time perception and attitudes.

**Objective 5:** *To explore the key factors that influence time use patterns among tourists alongside tourist choice of mobility, destinations and leisure activities at different stages of a holiday trip*

Tourists have certain patterns of using time on holiday. Such ways are associated with the desired tourist experiences at the destination. Accessibility and flexibility are also a key aspect when it comes to the movement at destinations. The study, however, has revealed that tourist time use patterns can be determined by various factors, which are represented as the travel context. Travel context consists of several factors including length of stay, trip purpose, travel party and repeat or first visit. This defined travel context also influence tourist perception of and attitudes towards time throughout a holiday trip. The qualitative research has also identified the potential TREs that may occur in different stages of a holiday trip.

**Objective 6:** *To investigate the extent to which time savings achieved by the availability of more time-efficient transport affect tourists' behavioural patterns, or the occurrence of the TRE*

Time savings from faster travel technology en-route can influence tourists' behaviours, prompting changes in their behaviour. The observed changes have shown to be related to how they would reinvest the time savings into not only en-route travel but also elsewhere in the holiday context. Most tourists' behavioural changes are linked to the desire for a better experience which commonly meant to maximise their holiday using the time savings for tourism-related travel and activities. Tourist behavioural changes occur differently depending on various factors such as socio-demographic



characteristics (age, gender, employment status, having children or not), holiday preferences (travel distance, independency, choosing new destinations), availability of time and money. Besides, psychological values (time perception/attitudes) and time use patterns that tourists already possess are another key factor to behavioural changes due to the time savings. This is presented in Figure 6.1 which summaries the factors that affect the TRE. These factors are interrelated to one another, affecting the TRE occurrence potentially. The significance of (negative) environmental impacts of the TRE would depend on which factor attributes (see Potential Effects in Figure 6.1).

**Objective 7:** *To identify the key forms of the TRE that help provide empirical evidence of the applicability of the (T)RE concepts in the tourism context*

The key forms of the potential TREs when given time savings from faster travel technology for tourist en-route travel included behavioural changes in regard to destination choice, en-route travel and activities on-site and on other sites (e.g. in/around home), with implications for negative environmental impacts. Though they were found to be less likely to occur than the potential(negative) TREs, there may also be potential effects that are related to lower environmental impacts where tourists use the time savings in less energy-intensive activities on-site or on other sites such as in/around home. Reflecting on the findings, the conceptual framework has been refined as presented in Figure 6.2 in this Chapter.

**Objective 8:** *To provide managerial and policy-making recommendations aiming to mitigate the negative environmental impacts of tourism*

This is discussed in Section 6.4.4 of this chapter.

## **6.4. Contribution to knowledge**

### **6.4.1. Theoretical contribution**

The theoretical contribution of this study lies in establishing a conceptual framework to identify the potential (T)RE in the tourism context. The framework was not only developed on the basis of the literature, but also empirically tested. The conceptual framework involves a critical analysis of the underlying assumptions of the traditional RE from the literature and empirical studies. The framework reflects the need for the

application of the concept of the (T)RE in tourism studies. This helps create new knowledge for sustainable tourism development concerning consumer behavioural responses to technological innovations in tourism and environmental implications. The study findings imply that in order to understand changes of tourist behaviour and their implications for the environment, the (T)RE should be taken into consideration.

Going beyond the existing literature on tourist consumption, the study examines the effects of consumer behaviour from a different angle. The study acknowledges the limitations of technological improvements in tourism services for environmental sustainability and also adds the time dimension to analysis. The application of the time dimension to explain tourist consumption contributes to the tourist consumption studies by enabling the role of time in consumer behaviour in the tourism context and its implications for the environment to be more fully understood.

#### **6.4.2. Empirical contribution**

The study has responded to the calls of previous studies (Sorrell 2007; Peeters 2010; Jenkins et al. 2011; Hall 2013, 2015; Aall et al. 2016; Shuxin et al. 2016; Filimonau et al. 2018; Wang et al. 2018; Gössling and Hall 2019) that have explicitly highlighted high probability of the occurrence of the (T)RE in tourism but not provided empirical evidence of it. This study has empirically examined the proposed conceptual framework and yielded empirical evidence to support the framework's validity. This study adds an extra layer to the empirical analysis of the RE by incorporating the time dimension. Therefore, the study sheds light on what drives behavioural changes of consumers regarding energy consumption and likely occurrence of the TRE within the context through a detailed examination of individual tourist behaviour and consumption patterns integrating time perspective. The findings underline the importance of understanding the (T)RE and its implications for the environmental sustainability of tourism.

#### **6.4.3. Methodological contribution**

This study introduces a methodological approach to design and test the TRE in tourism. The main approach has been the combination and application of the concepts of the (T)RE, consumer time use behaviour and environmental impacts of tourism to study

the potential (T)RE and its environmental implications. A set of themes derived from the qualitative research and survey measures used in the quantitative research can be subsequently refined and used in future research on the role of time in pro-environmental consumer behaviour not only in the tourism but also other consumption contexts.

#### **6.4.4. Contribution to practice: managerial and policy implications for managers and policy makers**

A detailed analysis of the implications of changes in time evoked by technological improvements in tourism, which was one of the main objectives of this study, contributes to strategic managerial applications and policies to reduce the environmental impacts of tourism taking the (T)RE into consideration. While the difficulty for implementation is acknowledged, this study provides insights into new directions for evidence-based strategies and policies influencing tourist consumption practices. The study suggests that strategies to reduce GHG emissions from specific modes of tourist transport could be tailored around tourist behavioural changes, considering the time dimension, rather than solely focusing on technological solutions. Energy reduction policies in tourism can consider the environmental implications of the (T)RE that have been found to be rather negative (energy-intensive). As an example, the importance of the RE has been recognised by UNWTO (2018) in the context of designing its energy efficiency policies and programmes; however, its implications have been overlooked due to the lack of empirical data. Hence, a deeper understanding of underlying implications of the study findings including greater awareness of the (T)RE phenomenon will aid in reinforcing managerial strategies and policies to advance towards a more sustainable future.

This study informs tourism managers and practitioners how they can develop improved strategies for dealing with environmental impacts of tourism by applying a deeper understanding of how consumers respond to the intervention of technological efficiency improvements. The study findings reveal that certain types of tourists (for example, younger people and young professionals) are more prone to the TREs. Tourism products can be made more attractive to these types of tourists in a way that such products are developed not only to appeal to the specific target segments of tourists but also to be compatible with the principles of sustainable tourism

development. Appropriate and adjusted marketing/demarketing strategies can be established whereby the target groups are encouraged to practice less energy intensive travel. As an example, hired influencers on social media platforms, such as Instagram sharing their plan or experience of a low carbon holiday, can be effective where they travel at a slow pace by alternative modes of transport other than car or plane within a limited time (e.g. Han et al. 2018). These strategies however should incorporate the time dimension as a critical element in what transportation means tourists choose to reach a destination.

Decisions on establishing infrastructure of faster travel technologies would require a comprehensive consideration of the potential impacts of the TRE. Such technologies should be offered to promote changes towards sustainable travel behaviors. This can not only support continuous sustainable design of transport technologies but may also encourage a modal shift of certain tourist groups for en-route travel. For example, the cluster of Busy explorers identified in the current study can switch from energy intensive towards less energy intensive travel modes, e.g. from air to high-speed rail, in which their desire for faster travel can still be fulfilled. Small changes targeting certain groups of people such as the Busy explorers can lead to a positive snowball effect in the long term. This can further be accelerated by enhanced connections and increased services of less energy intensive travel modes.

Moreover, tourism policy implications can be drawn by investigating tourists' perception of time availability. As found in this study, people with a perception of time constraints (e.g. full-time employees) tend to show behavioural changes (the TRE) more likely than those who perceive to have enough free time (e.g. retirees), with the implications for negative environmental impacts. An increase in the availability of physical free time (actual clock time) would relieve people from thinking of time constraints for holiday travel and tourist activities, which in turn can drive less of behavioural changes on holiday with the time savings given from faster travel technology. For instance, the government of New Zealand has recently suggested adopting a four-day work week to revive domestic tourism following the global coronavirus pandemic (Roy 2020). Longer weekends mean more discretionary time available, three consecutive days, which then can increase the perceived time availability for holidays, disregarding income effects. As a result, this can alter behavior

of some people such as the Busy explorers towards slower travel patterns en-route and on-site with reduced environmental impacts. However, the possibility of the TRE should also be noted in this context such as an increasing number of short breaks taken by the Travel time lovers. These findings thus provide insights into policy guidance on working time and pattern regulations to take into consideration the potential TRE occurrence. Such a policy guidance can further be strengthened and advanced in support of sustainable tourism development by encouraging the expansion of slow travel options embracing continuous technological development.

Further managerial and policy recommendations lie in the importance of understanding and adapting dynamics of tourist travel patterns at the destination. There is a compelling evidence that, when it comes to on-site travel, tourists tend to prefer car for flexibility and convenience, which denotes the potential environmental burden for tourist destinations. The car provides an element of freedom in terms of time use on-site by allowing tourists to have speed, flexibility and convenience as well as accessibility to certain areas, which however is closely related to the increasing contribution to tourism's GHG emissions. This provides guidance on managing and protecting tourist destinations from the environmental impacts associated with travel within the destinations. For example, local governments or tourism operators can offer local transport packages to appeal to such tourists as the Busy explorers that use more sustainable transport options, e.g. bus, rail, cycle and even walk (path), for travelling between tourist attractions and activity sites. This will help tackle travel associated negative environmental impacts and allow tourists to have seamless travel between places without time lags.

Furthermore, appropriate policies should be in practice; for instance, low/zero-emission car zones can be adopted at destinations where the car hire rates tend to be high. To encourage low/zero-emissions tourism mobility, electric vehicles for hire or electric taxi services can be offered for tourists as some destinations have already adopted such as Werfenweng in Austria (Eijgelaar and Peeters 2018). This approach should particularly be considered in places where private vehicles are essential, e.g. remote areas. Besides, the implications of the pandemic on future car use by tourist should be acknowledged as the global pandemic is changing people's travel behaviour (Sung and Monschauer 2020). Due to fears of contracting and spreading the virus,

tourists would rather choose to use car than, previously preferred, public transport at destinations, in which a rapid transition to low/zero-emission car zones may be imperative.

## **6.5. Limitations**

A number of limitations have been acknowledged throughout the thesis. Chapter 3 outlines methodological limitations of the study in both Phase I and Phase II research.

Though the conceptual framework was developed based on the literature review and refined by the empirical research, certain factors of the TRE have not been studied in sufficient depth. These include anticipated RE drivers such as the efficiency gains in tourist accommodation or activities on site, or influential factors such as the cultural effects. The study primarily addressed the potential TREs driven by the time savings en-route and therefore future research should aim at addressing these excluded, but potentially important, factors.

Primary data collection for both qualitative and quantitative research was conducted in the UK with tourists residing in the UK at the times of research. Although the sample was representative of UK tourists, this implies that tourists live in other places may show different responses. Due to the geographical location of a country, tourists in Australia, for example, may show more of potential TREs in all aspects because they are likely to travel long distance to get to overseas destinations. There also could be inconsistency in responses especially with regard to the time perspectives due to cultural differences if the research was conducted outside the UK. In this regard, Lewis (2006) denotes that time concepts and the use of time (i.e. how to spend more efficiently and meaningfully) are very culture-specific. For instance, the 'multi-active' Southern Europeans can be interested in spending the time savings from faster travel in a few tourist activities simultaneously, whereas the 'linear active' Americans may feel fulfilled by organising (more like prioritising) and engaging in different activities in the right order once at a time (Lewis 2006). The environmental impacts of activity engagement at a destination can be very different between tourists from the two cultures.

COVID-19 has significantly shifted the shape of global tourism since the beginning of 2020. The impact of COVID-19 on tourism has been enormous and the industry's crisis is expected to continue. However, these have not been accounted for or reflected on in this study as both qualitative and quantitative research were conducted prior to the pandemic's occurrence. When it comes to travel, the focus may move onto health and safety rather than speed until the world fully recovers from the COVID-19 crisis at least. If this research was conducted during or after the global pandemic, the responses from the same or other interview participants and survey respondents could have been quite different.

## **6.6. Recommendations and suggestions for future research**

This thesis indicates a number of avenues for future research. First, the study findings suggest certain groups of tourists are more likely to show behavioural changes given the time savings from faster travel technology. Further work can take advantages to better understand different types of market segments in tourism in relation to the potential (T)RE by approaches such as a focus group discussion, participant observation (as a group) or choice experiment. Such work may be useful to support a priori quantitative research such as a questionnaire survey. For example, a questionnaire survey can be carried out for analysing the Millennials and their behavioural changes. A focus group research involving several Millennials can be followed to identify their perception and use of time in a holiday context in relation to the findings from the quantitative research, as this study or the literature does not provide a clear identification on such matters for the Millennials.

There is a need to understand other RE issues than the TRE. Strategies of this study can be applied to explore environmental values of consumers through qualitative and quantitative research to critically analyse how they relate their environmental (socio-psychological) values relating travel and the use of transport on holiday trips. Furthermore, researchers need to examine how these would relate to behavioural changes due to the reduction of socio-psychological costs (socio-psychological RE).

Time use patterns on-site among all the influential factors appear to be an exclusive factor that is connected with the rest of the influential factors. In other words, other

influential factors can alter the patterns of time use of a tourist, which has not been covered in this study. Therefore, future research can investigate the relationship between time use patterns and all other factors.

Further research needs are identified around understanding the degree of environmental impacts of the TRE. Tourist behavioural changes due to time savings from faster travel technology are associated with negative environmental impacts. There is potential for more studies to project the potential GHG impacts of the (T)RE in the tourism context including all tourism sub-sectors of tourist transport, accommodation and activities. For instance, time use surveys that have been employed in investigating residential energy consumption (see, for example, Druckman et al. 2012; Jalas and Juntunen 2015; Sekar et al. 2018) can be employed in future studies. This approach can be adopted to examine tourist energy consumption in an accommodation. Comparative research methods can be used in which two lodging facilities are compared with one equipped with energy-efficient technologies.

There is a need for further work addressing the potential (T)RE rather than leisure holiday trips. While this study has focused only on tourism for leisure purpose and activities, the RE, especially with respect to time, i.e. TRE, may have important implications for other types of tourism such as business tourism. Considering business travel takes up about a quarter of the international tourism market (UNWTO 2019), the needs for exploration of the (T)RE and the environmental implications in such context are unquestionable. For instance, future research can compare how time perspectives and use occur differently between leisure tourists and business tourists, considering time may operate differently for business tourists. A tourist's behavioural changes may reflect their reason of travelling.

Finally, future research needs to look at the RE in tourist consumption after the imposed travel restrictions related to the global pandemic, such as quarantines and entry bans, are lifted. The pandemic has limited people's physical activities such as travel and tourism, particularly internationally, which however has enabled people to save time and money from not taking holidays far away from home. This is likely to push a rapid transition to increasing holiday travel by using the time and money saved, i.e. the potential RE (OECD 2020b). An indication of the potential RE for holiday travel



is linked to people's strong desire to travel. As Elliott (2020) notes, people will intend to make up for missed travel during the pandemic and try to use their travel vouchers as quickly as possible before the expiration dates. Such behavioural responses from tourists will, therefore, provide fertile ground for further study of the RE in diverse contexts.

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## **Appendix 1 Interview protocol**

- Introduce myself and the project.
- Review information sheet and answer questions to an interviewee.
- Sign consent form.
- Confirm recording.

### Start recording

#### **Introductory question (5min)**

1. Can you briefly tell me about your holidays during the past 12 months?

#### **Part A: The use of time (20min)**

“I’d like to hear how you feel about time in your daily life.”

1. Can you tell me about how busy your typical day is?
2. Can you tell me about the situation when you feel you do not have time?
3. How much of your time during an average week is spent doing things that you dislike or you feel waste your time?

Prompts: when do you think time flies during the day?

“People experience time differently in different contexts. In the context of holidays, time is considered as a great importance in particular. I’d now like to talk to you about your use of time regarding holidays.”

4. How do you plan holidays in terms of time?

Prompts: transport; accommodation; activities; when do you plan? What are the main factors affecting your plan? Plans for timing of activities/visits; planning related scheduled/booked events? How does the amount of time affect your choice of destination; travel mode; length of stay? To which does it affect most? How do you allocate time throughout a holiday period?

5. How do you spend your time at a destination?

Prompts: Do you tend to follow the schedule you have planned? How does the amount of time affect your activities? What are the factors affecting your activity plans? Travel in a destination; changes in plan

“Now, I’d like to talk to you about time relating to your recent holiday experiences. Can I ask you to recall the single most significant holiday over the past 12 months?”  
(LINK THIS TO INTERVIEWEE’S ANSWER)

6. Reflecting on the experience, how did you spend your time when travelling to/from the (DESTINATION)?

Prompts: What transport type did you use? How long was the one-way journey?  
Did you prepare some activities to do? E.g. puzzles; reading; eating; studying;  
How did you feel about time spending on (TRANSPORT MODE)

7. What made you choose the transport mode to and from the (DESTINATION)?

Prompts: mode of transport; plans for travel mode; connecting mode for the main travel, timing of travel; influence of other people; travel companion; children; past experience

8. How did you spend your time at the (DESTINATION)? Or, what did you do?

Prompts: Did you have a planned timely schedule? plans at destination(s); activities; attractions; visits; excursions; timed events; disruption to the plan; travel within the destination; Is there anything you would like to have done but you did not have time for?

## **Part B: Time savings en-route and on-site affecting tourist behaviour (15min)**

“Now, imagine there has been a technological improvement which enables planes (or RESPONDENT’S RECENTLY USED TRANSPORT TO A DESTINATION) to fly even faster and/or cover longer distance within the same time. Considering this, I’d like to talk to you about your view on how you see your holidays changing in terms of the 1) distance travelled 2) time spent at a destination.”

1. Again, reflecting on your single most significant holiday during the past 12 months, what would you have done? (LINK THIS TO INTERVIEWEE’S ANSWER)

Prompts:

- 1) How would this affect your planning? – Would you still go to (DESTINATION)  
OR choose to travel elsewhere, perhaps further away?

- 2) How would this affect your holiday experience? – If you stick to (DESTINATION), would you choose to stay longer OR come back home earlier or leave home later?
- 3) If staying longer, what would you do in that extra time? OR If coming home earlier or leaving home later, what would you do in that extra time at/around/outside home?
2. Can you describe what you would do at destination(s) if you could get to the places more quickly than planned thanks to the technology?
- Prompts: How would you feel about it? Would you do something that has not been planned?
3. What do you think about potential time savings at a destination?
- Prompts: e.g. faster/automated technology in hotels such as self check-in; a mobile app for local public transport

### **Part C: Tourists' feeling about time (10min)**

“Now, I'd like to talk to you about your general feeling about time relating to holidays.”

1. How do you feel about time when it comes to a holiday in general?
- Prompts: How do you feel about time when on a holiday, compared to your everyday life? Is time an important factor on your holidays? How does that affect? Do you get enough time to manage all activities that you aim to do on a holiday? What made you feel that way?
2. Then, how do you feel about time spending specifically on travelling for a holiday?
- Prompts: positive (enjoyment; comfort; free time) or negative (wasted; indifferent; stressful);
- How do you feel about additional time required for a certain mode (e.g. waiting; connecting);
- Do you see it as a stage to get to a holiday destination or as part of a holiday?
- How do you feel about travel time when coming back home? Would you want it to be short(er)?

3. Tell me about an ideal holiday for you from the perspective of time.

Prompts: how quickly would you need to reach the destination? What type of transport would you prefer? Do the available types of transport modes to travel affect the choice of destination? Does the timing of travel affect? How long would you go for? How would you use time at a destination?

#### **Part D: Tourists' pro-environmental attitudes (5min)**

"Tourism can be a source of environmental damage. Now, I'd like to talk to you about environmental impacts of tourism."

1. Can you tell me anything you know about environmental impacts of tourism?

Prompts: a) Would you see any impact related to energy or other resources such as water? b) Can you relate environmental impacts to your whole journey of tourism to somewhere – transport; accommodation; activity at the destination?

2. Can you give me any examples of where you have tried to reduce your environmental impact in tourism?

Prompts: changes to less energy consuming/more environment-friendly options e.g. transport (to/from destinations, local travels), accommodation, activities

#### End recording

\*Check recording(s) if it is well recorded

Concluding remarks – thank everyone and any questions from participants (5min)

#### **Profiling questions \*Please tick the box that applies.**

1. Which of the following best describes your age range?

☐ 18-24                      ☐ 25-44                      ☐ 45-64                      ☐ 65 and above

2. How do you personally describe your gender identity? (                      )

3. Please specify your ethnicity. (                      )

4. Which of the following best describes your role in industry?

- ☐ Senior manager/Director ☐ Middle manager ☐ Junior manager  
☐ Administrative staff ☐ Trained professional ☐ Skilled labourer ☐ Consultant  
☐ Temporary employee ☐ Researcher ☐ Self-employed ☐ Support staff  
☐ Student ☐ Unemployed ☐ Retired ☐ Other ( )

5. Do you have children? If so, what are the ages of your children and do they live with you? (Mark all that apply)

|                        | They do not live with me | They live with me (part/full-time) |
|------------------------|--------------------------|------------------------------------|
| Yes, 0 to 5 years old  |                          |                                    |
| Yes, 6 to 17 years old |                          |                                    |
| Yes, 18+ years old     |                          |                                    |
| No, I do not have one  |                          |                                    |

Reflecting on the single most significant holiday over the past 12 months,

6. What was the purpose of your trip?

- ☐ Leisure ☐ Business ☐ Visiting friends and relatives ☐ Other ( )

7. Where did you go?

- ☐ Domestic (within the UK)  
☐ International (Europe)  
☐ International (outside of Europe)

8. What mode(s) of transport you used to/from the destination? (Mark all that apply)

- ☐ Car ☐ Bus/Coach ☐ Train ☐ Airplane ☐ Other (please specify: )  
☐ Mixed (please specify: )

9. How long did you go for?

- ☐ Weekends/Short break (1-3 days) ☐ Week holiday (up to 7 days) ☐ Longer holidays (+7 days)

## Appendix 2 Participant Information Sheet for interviewees



### Participant Information Sheet

#### ***“Time use and holidays”***

##### *Invitation to take part*

You are being invited to take part in a research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

##### *What is the purpose of the project?*

Research suggests that people experience time differently, depending on the context. When it comes to tourism, for instance, time is considered a key resource. For example, the amount of time available to tourists can affect their length of stay at a holiday destination. Although the importance of time in tourism has long been recognised, there has been a lack of research on this subject. Thus, this project aims to find out the impacts of time on tourists' holiday experiences while being en-route (i.e. when travelling to/from a destination) and while being on-site (i.e. at a destination). To this end, this project seeks to understand how tourists feel about time when going on holiday. This research seeks to fill the current gap in knowledge and contribute to tourism policies and managerial practice by providing important implications. Duration of the project is three years from September 2017.

##### *Why have I been chosen?*

You have been chosen to participate because you have travelled at least once over the last 12 months for holiday purposes, either within the UK or overseas. Research aims to recruit 20 participants in total.

### *Do I have to take part?*

It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a participant agreement form. You can withdraw from participation during the interview at any time and without giving a reason. If you decide to withdraw we will usually remove any data collected about you from the study. Once the interview have finished you may still be able to withdraw your data up to the point where the data is analysed and incorporated into the research findings or outputs. At this point your data will usually become anonymous, so your identity cannot be determined, and it may not be possible to identify your data within the anonymous dataset. Withdrawing your data at this point may also adversely affect the validity and integrity of the research.

### *What would taking part involve?*

If you agree to take part in this study we will interview you and audio record the interview. The interview will last between 30 and 60 minutes and will be carried out at a public location that is convenient to you such as a local café. We may ask you to participate in a follow-up interview, though participation in this is optional.

### *What are the advantages and possible disadvantages or risks of taking part?*

Whilst there are no immediate benefits to you participating in the project, it is hoped that this work will help in better understanding of tourists' holiday experiences that contributes to knowledge for sustainable tourism development.

### *What type of information will be sought from me and why is the collection of this information relevant for achieving the research project's objectives?*

We will ask you about your recent holiday experiences and your feelings about time in the context of holidays. The information collected will be part of data that will answer the research questions.

### *Will I be recorded, and how will the recorded media be used?*

The audio recordings of the interviews made during this research will be anonymised to be used for analysis. The transcription of the recordings will be used for PhD



thesis and papers as well as for illustration in conference presentations and lectures. No other use will be made of them without your written permission, and no one outside the project will be allowed access to the original recordings.

#### *How will my information be kept?*

All the information we collect about you during the course of the research will be kept strictly in accordance with current data protection legislation. Research is a task that we perform in the public interest, as part of our core function as a university.

Bournemouth University (BU) is a Data Controller of your information which means that we are responsible for looking after your information and using it appropriately. BU's Research Participant Privacy Notice sets out more information about how we fulfil our responsibilities as a data controller and about your rights as an individual under the data protection legislation. We ask you to read this Notice so that you can fully understand the basis on which we will process your information.

- Publication

You will not be able to be identified in any external reports or publications about the research without your specific consent. Otherwise your information will only be included in these materials in an anonymous form, i.e. you will not be identifiable.

- Security and access controls

BU will hold the information we collect about you in hard copy in a secure location and on a BU password protected secure network where held electronically.

Except where it has been anonymised your personal information will be accessed and used only by appropriate, authorised individuals and when this is necessary for the purposes of the research or another purpose identified in the Privacy Notice. This may include giving access to BU staff or others responsible for monitoring and/or audit of the study, who need to ensure that the research is complying with applicable regulations.

- Sharing and further use of your personal information

As well as members of the research team working on the research project, we may also need to share personal information in non-anonymised with external organisation(s) such as external collaborators and funders.

The information collected about you may be used in an anonymous form to support other research projects in the future and access to it in this form will not be restricted. It will not be possible for you to be identified from this data. Anonymised data will be added to BU's Data Repository (a central location where data is stored) and which will be publicly available.

- Retention of your data

All personal data collected for the purposes of this study will be held for 5 years after the award of the degree. Although published research outputs are anonymised, we need to retain underlying data collected for the study in a non-anonymised form for a certain period to enable the research to be audited and/or to enable the research findings to be verified.

Contact for further information

If you have any questions or would like further information, please contact

Soheon Kim (PhD researcher)

Bournemouth University, Fern Barrow, Poole, Dorset, BH12 5BB, United Kingdom

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In case of complaints

Any concerns about the study should be directed to Soheon Kim [skim@bournemouth.ac.uk](mailto:skim@bournemouth.ac.uk). If your concerns have not been answered by Soheon Kim, you should contact Professor Michael Silk, Deputy Dean for Research & Professional Practice in the Faculty of Management, Bournemouth University by email to [researchgovernance@bournemouth.ac.uk](mailto:researchgovernance@bournemouth.ac.uk).

Finally

If you decide to take part, you will be given a copy of the information sheet and a signed participant agreement form to keep.

Thank you for considering taking part in this research project.

### **Appendix 3 Example of questionnaire used in pilot survey (short-haul, beach holiday destination scenario)**

#### **Time Use and Holidays: Questionnaire**

We would like to invite you to participate in a survey conducted by academics in Faculty of Management at Bournemouth University, the UK. This survey is part of the study which aims to better understand the impacts of time on tourists' holiday experiences while being en-route (i.e. when travelling to/from a destination) and while being on-site (i.e. at a destination). The following questions, thus, are related to feelings about time and holiday experiences. There are no right or wrong answers to the questions. It is your opinions that are important and all views are relevant to this study. All the information collected from you will be kept completely anonymous and confidential. The outcome of this survey will be utilised for the academic purposes only. Please complete all the parts of the questionnaire.

The survey consists of four short parts and will require approximately 15 minutes to complete. If you have any questions or would like further information, please contact Ms. Soheon Kim, PhD researcher via [skim@bournemouth.ac.uk](mailto:skim@bournemouth.ac.uk).

We would like to thank you very much for your participation in advance.

\*Holidays include all overnight trips (at least one night) away from everyday life taken for leisure purposes.

\*If you have decided to participate, please take time to read 'Participant Information Sheet'.

Please tick the box if you consent to participate.

☐ I confirm that I have read and understood the information provided and I agree to take part in the study.

## PART I

This part asks you to provide some information about your recent holiday experiences. Please think about one most significant, for you personally, holiday over the last 12 months, within the UK or overseas, reflecting on your experiences.

1. Please specify the destination (i.e. city or country) you went to here.

( )

2. What was the main mode of transport you used to/from the destination (i.e. the mode used for the longest distance travelled)?

☐ Car      ☐ Bus/coach      ☐ Train      ☐ Airplane  
☐ Ship/Boat/Cruise/Ferry   ☐ Campervan   ☐ Other (please specify: )

3. What other modes of transport did you use to get to the destination (e.g. to get from home to the airport if you flew or to get to the train station if you took a train)? (Mark ALL the apply)

☐ Car      ☐ Bus/coach      ☐ Train      ☐ Airplane   ☐ Ship/Boat/Ferry  
☐ Campervan      ☐ Cycling/walking   ☐ Other (please specify: )

4. During the same holiday, did you stay overnight in more than one destination?

☐ No, I stayed in only one specific destination.

☐ Yes, I stayed overnight in more than one place during the same holiday period.

If you answered 'No', please go directly to Question 6.

If you answered 'YES', please move on to the next question.

5. Please specify how many destinations (how many different places) you stayed overnight during the same holiday.

( ) places

6. With whom did you travel? (Mark ALL the apply)

☐ Alone

☐ Partner/spouse

☐ Family with pre-school child/children (0-4)

☐ Family with school-age child/children (5-17 year old)

☐ Family with child/children older than 17

☐ Family with parent(s)

☐ Other friends or relatives

7. Was that your first visit to this place?

☐ Yes

☐ No

8. Please tell us how good each of the following were for you on the recent holiday.

| Please tick one box each row                                                                                                             | Very poor | Poor | Neutral | Good | Very good |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------|------|---------|------|-----------|
| The availability of tourist accommodation on offer at the destination                                                                    |           |      |         |      |           |
| The availability of food and drink services on offer at the destination (i.e. restaurants, bars)                                         |           |      |         |      |           |
| The availability of public transport services at the destination                                                                         |           |      |         |      |           |
| The variety of tourist activities & attractions at the destination (such as theme parks, entertainment, sport activities, museums, etc.) |           |      |         |      |           |
| The quality of natural environment at a holiday destination (such as weather, beaches, beauty of the scenery and towns, etc.)            |           |      |         |      |           |

9. How much did you spend on travel (i.e. return flight tickets plus any other additional, significant travel such as coach from home to the airport) for yourself only (do NOT include other members of the travelling group)?

☐ Up to £200 ☐ £201-£500 ☐ More than £500

10. How much did you spend for yourself in total, while at the destination (do NOT include the cost of accommodation)?

- ☐ Up to £100      ☐ £101-£200      ☐ £201-£300  
☐ £301-£400      ☐ £401-£500      ☐ More than £500

11. How did you feel about the cost of staying at the destination (including local transport but excluding the cost of travel to/from the destinations)? Please tell us how much you agree with each of the following statements.

| Please tick one box each row              | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|-------------------------------------------|-------------------|----------|---------|-------|----------------|
| The destination has reasonable prices.    |                   |          |         |       |                |
| The destination has good value for money. |                   |          |         |       |                |

12. Was the holiday organised by a tour operator (i.e. was it a so-called package holiday)?

- ☐ Yes      ☐ No

13. How long did you go for? ( ) nights

14. Which of the following best describes the type of your recent holiday (if unsure please select the best category you deem your holiday falls under)?

- ☐ City break (e.g. a short leisure trip to one city or town)
- ☐ Sun and beach holiday (e.g. a beachside holiday, relaxing and sunbathing)
- ☐ Countryside break (e.g. an escape to the countryside enjoying outdoor activities)
- ☐ A sightseeing trip (e.g. a trip with activities of travelling around city and/or region to see interesting places)
- ☐ An all-inclusive holiday (e.g. a holiday at a resort that offers different packages of amenities at a fixed price including meals/drinks, activities, entertainments)
- ☐ Other (please specify: \_\_\_\_\_)

## PART II

People perceive time differently in different contexts. We would like to hear how you feel about time in the holiday context in this part.

First, we would like to know how you feel about time on holiday. You can reflect on your most significant holiday that you mentioned earlier.

1. Please tell us how much you agree with each of the following statements.

| Please tick one box each row                                                                         | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| Time seemed to fly when I was doing something new on holiday.                                        |                   |          |         |       |                |
| I felt time was going faster when I was doing something enjoyable on holiday.                        |                   |          |         |       |                |
| While on holiday, I often lost track of time.                                                        |                   |          |         |       |                |
| The holiday time seemed never ending <b>at the beginning</b> of holiday.                             |                   |          |         |       |                |
| I felt time seemed slowing down when I was in a new environment on holiday.                          |                   |          |         |       |                |
| When on holiday, I did not keep to mealtimes (e.g. lunch, dinner) as I normally do in everyday life. |                   |          |         |       |                |
| <b>At the end of holiday</b> , I felt time had gone by so quickly.                                   |                   |          |         |       |                |
| I felt time was longer when I had a certain schedule to follow on holiday                            |                   |          |         |       |                |

Now, we would like to know how you feel about and use time on holiday. You can reflect on all your previous holiday experiences.

2. Please tell us how much you agree with each of the following statements.

| Please tick one box each row                                                                                                    | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| Travel to/from a holiday destination is a fun and makes an enjoyable part of my holiday.                                        |                   |          |         |       |                |
| I enjoy any additional time required for reaching the destination, such as waiting time at the airport or waiting for transfer. |                   |          |         |       |                |
| When on holiday, I normally have enough time to manage everything I want.                                                       |                   |          |         |       |                |



|                                                                                                                                        |  |  |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| Travel to/from a holiday destination is a necessary evil.                                                                              |  |  |  |  |  |
| My time is limited and I want to arrive at the destination as quickly as possible in order to spend more time at the destination.      |  |  |  |  |  |
| My holiday only starts when I arrive at the destination.                                                                               |  |  |  |  |  |
| My mode of transport to the destination affects how I feel about the time taken when travelling to/from holiday destination.           |  |  |  |  |  |
| The length of a travel journey to the destination affects how I feel about the time taken when travelling to/from holiday destination. |  |  |  |  |  |
| I want to see as many things and do as many activities and experiences as possible when on holiday.                                    |  |  |  |  |  |
| In general, I prefer having a vehicle (e.g. my own or rented car) for flexibility at the destination.                                  |  |  |  |  |  |
| I want to enjoy quality time on holiday, rather than rushing around to see or visit most of the things the destination offers.         |  |  |  |  |  |
| I can easily return another time, if I could not do everything I wanted or planned this time on holiday.                               |  |  |  |  |  |

Here, we would like to know how you feel about managing time for holiday activities. You can reflect on ALL your previous holiday experiences.

3. Please tell us how much you agree with each of the following statements.

| Please tick one box each row                                                                                                                                        | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| I have enough free time to travel for holiday trips in general.                                                                                                     |                   |          |         |       |                |
| At the beginning of holiday, I find it hard to schedule my holiday activities in a timely manner because there are so many things to do and see at the destination. |                   |          |         |       |                |
| I do not have enough time to manage all desired activities at a destination.                                                                                        |                   |          |         |       |                |
| When on holiday, I have to follow time schedules or plans.                                                                                                          |                   |          |         |       |                |
| When on holiday, I have flexibility of changing schedules and plans, as I want.                                                                                     |                   |          |         |       |                |
| There are so many things I want to do during my holiday trip, so I often feel time is running out at the end of holiday.                                            |                   |          |         |       |                |

## PART III

Now, imagine there has been a technological improvement, which enables you to travel faster and/or cover longer distance within the same time when going on holiday. If you chose this new technology, you would save time from travel to/from the destination.

For example, instead of travelling from London to Majorca, Spain for 2.5 hours one way, you would only travel for 1.5 hours, thus saving in total  $1+1=2$  hours of travel time.

1. How would you use this saved time? Reflecting on your recent holiday, please tell us how much you agree with each of the following statements.

| Please tick one box each row                                                                                                   | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|--------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| I would still go to the same destination and use the saved time <b>at the</b> destination.                                     |                   |          |         |       |                |
| I would still go to the same destination, but use the saved time <b>in/around home before departure and after</b> the holiday. |                   |          |         |       |                |
| I would travel further away.                                                                                                   |                   |          |         |       |                |
| I would travel to the same destination but more frequently.                                                                    |                   |          |         |       |                |
| I would travel more frequently regardless of the destination.                                                                  |                   |          |         |       |                |

2. Reflecting on your recent holiday, please tell us how important each factor to you when considering taking this faster transport option.

| Please tick one box each row                                                           | Very unimportant | Unimportant | Neutral | Important | Very important |
|----------------------------------------------------------------------------------------|------------------|-------------|---------|-----------|----------------|
| The mode of transport                                                                  |                  |             |         |           |                |
| Whom I travel with                                                                     |                  |             |         |           |                |
| What the destination offers to tourists                                                |                  |             |         |           |                |
| My length of stay at the destination                                                   |                  |             |         |           |                |
| The availability of activities and attractions at the destination at the time I arrive |                  |             |         |           |                |
| Cost of travel faster                                                                  |                  |             |         |           |                |

3. If you had the saved time to spend at the destination, what would you do?
- a) I would go sightseeing around the place.
  - b) I would do some adventure sports and activities.
  - c) I would just relax in/around the accommodation.
  - d) I would go somewhere to eat/drink.
  - e) I would visit another place (e.g. nearby town/city).
  - f) Other (please specify)
4. If you had the saved time to spend in/around home before departure and after return, what would you do?
- ( )

5. In addition, how would you use the saved time from choosing this faster travel technology to/from holiday destination in general? Please tell us how much you agree with each of the following statements.

| Please tick one box each row                                                                    | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|-------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| Regardless of the cost, I would prefer travelling faster.                                       |                   |          |         |       |                |
| I would spend this extra time at home to get better prepared for my holiday.                    |                   |          |         |       |                |
| This technology would make it feasible to travel longer distances (outside Europe) for holiday. |                   |          |         |       |                |
| I would travel longer distances (outside of Europe) more frequently for holiday.                |                   |          |         |       |                |
| I would travel shorter distances but more frequently for holiday.                               |                   |          |         |       |                |
| I would go on more holidays in general.                                                         |                   |          |         |       |                |
| With the saved time, I would be happy to spend more time <b>at the destination</b> .            |                   |          |         |       |                |
| I would engage in more activities/ attractions at the destination.                              |                   |          |         |       |                |
| I would be willing to pay extra for faster travel to/from destination for my holiday trip.      |                   |          |         |       |                |
| I do not really care about the time savings achieved with this new technology.                  |                   |          |         |       |                |

6. If you chose this new technology, you would save time from travel to/from the destination (e.g. instead of travelling from London to Majorca, Spain for 2.5 hours one way, you would only travel for 1.5 hours, thus saving in total 1+1=2 hours of travel time).

How much more would you be willing to pay for faster travel with this technology, if the original flight fares for the round trip was £100?

- ☐ None
- ☐ £30 (30% more)
- ☐ £60 (60% more)
- ☐ £80 (80% more)
- ☐ £100 (100% more)
- ☐ More than £100 (more than 100%)

The next question is related to your general attitudes towards the environment in the holiday context.

7. Please tell us how much you agree with each of the following statement.

| Please tick one box each row                                                         | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|--------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| I prefer walk and/or cycle whenever possible on holiday.                             |                   |          |         |       |                |
| I use public transport whenever possible on holiday.                                 |                   |          |         |       |                |
| I love getting around the places on holiday by car.                                  |                   |          |         |       |                |
| If I need a car on holiday, I try to hire an environmentally friendly car.           |                   |          |         |       |                |
| I try to avoid highly carbon-intense modes of transport when I go on holiday.        |                   |          |         |       |                |
| I always use the fastest mode of transport to get to a holiday destination quickly.  |                   |          |         |       |                |
| 'Low cost' airlines (e.g. easyJet) enabled me to travel for holiday more frequently. |                   |          |         |       |                |

## PART IV: About you

This part asks you to provide information about you. Please note that your personal data will not be passed-on to anyone else and that you cannot be identified when the results are published.

1. Which of the following best describes your age range?

☐ 18-24      ☐ 25-34      ☐ 35-44  
☐ 45-54      ☐ 55-64      ☐ 65 and above

2. How do you personally describe your gender identity?

☐ Female      ☐ Male      ☐ Prefer to self-describe as (                      )

☐ Prefer not to say

3. Which of the following best describes your household income?

☐ Below £12,500      ☐ £12,501-£20,000      ☐ £20,001-£30,000

☐ £30,001-£40,000      ☐ £40,001-£50,000      ☐ Above £50,000

4. Please specify your nationality.

☐ British      ☐ Other (please specify: \_\_\_\_\_)

5. Which of the following best describes your current employment status?

☐ Full-time                      ☐ Unemployed and not currently looking for work                      ☐ Homemaker  
☐ Part-time                      ☐ Student                      ☐ Self-employed  
☐ Unemployed and currently looking for work                      ☐ Retired                      ☐ Unable to work

6. Do you have and/or live with any child younger than 18 at home (family status)?

☐ No, I do not have/ live with any.

☐ Yes, I have/live with one.

☐ Yes, I have/live with two.

☐ Yes, I have/live with three.

☐ Yes, I have/live with more than three.

7. How many holidays are you entitled per year (annual leave)?

☐ 1-7 days

☐ 22-28 days

☐ Not applicable

☐ 8-14 days

☐ 29-35 days

☐ 15-21 days

☐ More than 35 days

8. How many holidays did you go on in the last 12 months?

Weekend/short break (1-3 days) (                      times)

Week (up to 1 week) (                      times)

Longer (+7 days) (                      times)

## Appendix 4 Questionnaire used in main survey

### *Time Use and Holidays: Questionnaire*

I would like to invite you to participate in a survey conducted by academics in the Faculty of Management at Bournemouth University, UK. This survey is part of a study which aims to better understand the impacts of time on tourists' holiday experiences while en-route (i.e. when travelling to/from a destination) and while being on-site (i.e. at a destination). The following questions are related to feelings about time and holiday experiences. There are no right or wrong answers to the questions. It is your opinions that are important and all views are relevant to this study. All the information collected from you will be kept completely anonymous and confidential. The outcome of this survey will be utilised for the academic purposes only. Please complete all the parts of the questionnaire.

The survey consists of four short parts and will require approximately 10 minutes to complete. If you have any questions or would like further information, please contact Ms. Soheon Kim, PhD researcher via [skim@bournemouth.ac.uk](mailto:skim@bournemouth.ac.uk).

I would like to thank you for your participation in advance.

\*Holidays include all overnight trips (at least one night) away from everyday life taken for leisure purposes.

\*If you have decided to participate, please take time to read '*Participant Information Sheet*' from

[https://static.onlinesurveys.ac.uk/media/account/97/survey/552681/question/Participant\\_Information\\_Sheet\\_\\_r8f6ejj.pdf](https://static.onlinesurveys.ac.uk/media/account/97/survey/552681/question/Participant_Information_Sheet__r8f6ejj.pdf).

Please tick the box if you consent to participate.

☐ I confirm that I have read and understood the information provided and I agree to take part in the study.

## **PART I: Your holiday experiences**

**This part asks you to provide some information about your holiday experiences.**

***'Holiday' here is understood as any holiday trips undertaken for leisure purposes.***

**First, please tell me about your holiday preferences.**

1.1. Which do you generally prefer for your holidays?

- ☐ Domestic holidays (within the UK)
- ☐ Short-haul holidays (e.g. within Europe)
- ☐ Medium-haul holidays (e.g. Turkey, North Africa)
- ☐ Long-haul holidays (e.g. Asia, Americas)

1.2. What is your favourite type of holiday?

- ☐ City break (e.g. a short leisure trip to a city or town)
- ☐ Sun and beach holiday (e.g. a beachside holiday when one can relax and sunbath)
- ☐ Countryside break (e.g. an escape to the countryside where one can enjoy outdoor activities)
- ☐ A sightseeing trip (e.g. a trip with activities of travelling around a city and/or region to see some places of interest)
- ☐ An all-inclusive holiday (e.g. a holiday at a resort that offers different packages of amenities at a fixed price including meals/drinks, activities, entertainment)
- ☐ Other (please specify: \_\_\_\_\_ )

1.3. What are the top three most important factors for you when choosing a holiday?  
Please choose three factors from the list below.

- ☐ Travel time (distance) to/from a destination
- ☐ Means of transport to/from a destination (e.g. airplane, train, coach, car, etc.)
- ☐ Travel party/companion(s)
- ☐ Transport cost (e.g. return tickets to/from a destination)
- ☐ Accommodation cost (e.g. hotel)
- ☐ Cost of staying at a destination (e.g. local transport, food, activities)



- ☐ Availability of activities and attractions
- ☐ Type of experiences you want to have at a destination (e.g. whether you want to go shopping, spend time in nature, or relax on the beach)
- ☐ Other (please specify: \_\_\_\_\_ )

1.4. Which do you prefer?

- ☐ A package tour (i.e. this is when your holiday is organised by a tour operator)
- ☐ An independent tour (i.e. this is when you plan/organise your own holiday)

1.5. How do you choose your holiday destination? Please tell me how much you agree with each of the following statements.

|      |                                                      | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|------|------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| 1.5a | I tend to choose a new destination for my holiday.   |                   |          |         |       |                |
| 1.5b | I normally return to a destination I visited before. |                   |          |         |       |                |

1.6. Do you have children in your household? (Mark ALL that apply)

- ☐ No children in my household
- ☐ Pre-school child/children in my household (0-4 years old)
- ☐ School-age child/children in my household (5-17 years old)
- ☐ Adult child/children in my household (over 18 years old)

1.7. If there are children in your household, how does the presence of children in your household influence your holiday travel? \*Please move on to the next question if not applicable (when there are no children in your household).

|      |                                                                                                                    | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|------|--------------------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| 1.7a | It restricts the FREQUENCY of my travel for holiday (i.e. now I make fewer holiday(s) than before I had children). |                   |          |         |       |                |
| 1.7b | It restricts the DISTANCE I choose to travel for holiday (i.e. now I choose a destination which is                 |                   |          |         |       |                |

|  |                                             |  |  |  |  |  |
|--|---------------------------------------------|--|--|--|--|--|
|  | closer to home than before I had children). |  |  |  |  |  |
|--|---------------------------------------------|--|--|--|--|--|

1.8. Please tell me how much you agree with each of the following statements.

|      |                                                                                                                 | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|------|-----------------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| 1.8a | In general, I have enough free time for holiday travel.                                                         |                   |          |         |       |                |
| 1.8b | When on holiday, I normally have enough time to manage everything I want.                                       |                   |          |         |       |                |
| 1.8c | With limited vacation time, I prefer taking frequent short breaks in a year, instead of a single, long holiday. |                   |          |         |       |                |

1.9. To the best of your recollection, how many holiday trips did you go on in the past 12 months?

|      |                                | None | Once | Twice | Three times | Four times | More than four times |
|------|--------------------------------|------|------|-------|-------------|------------|----------------------|
| 1.9a | Weekend/short break (1-3 days) |      |      |       |             |            |                      |
| 1.9b | Week (4-7 days)                |      |      |       |             |            |                      |
| 1.9c | Longer (7+ days)               |      |      |       |             |            |                      |

**Now, please choose the single most significant holiday from your recent holidays over the past 12 months, within the UK or overseas.**

1.10. Please specify the destination (i.e. city or country) you went to here.

( )

1.11. How long did you go for? ( ) Nights

1.12. What was the main mode of transport you used to get to/from the destination (i.e. the mode used for the longest distance travelled)?

☐ Car

☐ Bus/coach

☐ Train

☐ Airplane

☐ Ship/Boat/Cruise/Ferry  
☐ Campervan

☐ Other (please specify: \_\_\_\_\_ )

1.13. With whom did you travel? (Mark ALL that apply)

- ☐ Alone  
☐ Partner/spouse  
☐ Family with pre-school child/children (0-4 years old)  
☐ Family with school-age child/children (5-17 years old)  
☐ Family with child/children over 18 years old  
☐ Family with parent(s)  
☐ Friends or relatives

1.14. Did you stay overnight in more than one destination? If so, please specify how many destinations (how many different places) you stayed overnight during the same holiday. \*If you stayed only in one place, please move on to the next question.

( \_\_\_\_\_ ) places

## **PART II: Time and holiday**

**People perceive time differently in different contexts. In this part, I would like to learn how you feel about time in the holiday context.**

2.1. First, I would like to know how you feel about time on holiday. Here, you can reflect on your recent holiday experiences if you wish to do so.

Please tell me how much you agree with each of the following statements.

|      |                                                                                                                   | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|------|-------------------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| 2.1a | Time seemed to fly when I was doing something new on holiday.                                                     |                   |          |         |       |                |
| 2.1b | I felt time was going faster when I was doing something enjoyable on holiday.                                     |                   |          |         |       |                |
| 2.1c | The holiday time seemed to never end AT THE BEGINNING of holiday.                                                 |                   |          |         |       |                |
| 2.1d | When on holiday, I did not keep to mealtimes (e.g. lunch, dinner) as much as I normally do in my day-to-day life. |                   |          |         |       |                |
| 2.1e | At the end of holiday, I felt time had gone by so quickly.                                                        |                   |          |         |       |                |

2.2. Now, I would like to know how you feel about travelling and how you spend time at holiday destinations. Here, you can reflect on your recent holiday experiences if you wish to do so.

Please tell me how much you agree with each of the following statements.

|       |                                                                                                                                   | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|-------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| 2.2 a | Travel to/from a holiday destination is fun and makes an enjoyable part of my holiday.                                            |                   |          |         |       |                |
| 2.2 b | I enjoy any additional time required for reaching the destination, such as waiting time at the airport or waiting for transfer.   |                   |          |         |       |                |
| 2.2c  | Travel to/from a holiday destination is a necessary evil.                                                                         |                   |          |         |       |                |
| 2.2 d | My holiday only starts when I arrive at the destination.                                                                          |                   |          |         |       |                |
| 2.2 e | My time is limited and I want to arrive at the destination as quickly as possible in order to spend more time at the destination. |                   |          |         |       |                |
| 2.2f  | I want to see as many things and do as many activities and experiences as possible when on holiday.                               |                   |          |         |       |                |
| 2.2 g | I want to enjoy quality time on holiday, rather than rushing around to see or visit most of the things the destination offers.    |                   |          |         |       |                |
| 2.2 h | There are so many things I want to do during my holiday, so I often feel time is running out at the end of holiday.               |                   |          |         |       |                |

2.3. In addition, I would like to know how you manage the time which you have for your holiday and activities. Here, you can reflect on your recent holiday experiences if you wish to do so.

Please tell me how much you agree with each of the following statements.

|      |                                                                                                                                                                     | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| 2.3a | At the beginning of holiday, I find it hard to schedule my holiday activities in a timely manner because there are so many things to do and see at the destination. |                   |          |         |       |                |

|      |                                                                                |  |  |  |  |  |
|------|--------------------------------------------------------------------------------|--|--|--|--|--|
| 2.3b | When on holiday, I have to follow time schedules or plans.                     |  |  |  |  |  |
| 2.3c | When on holiday, I have flexibility of changing schedules and plans as I want. |  |  |  |  |  |

2.4. Here, I would like to know how you use your time during the holiday. Here, you can reflect on your recent holiday experiences if you wish to do so.

Please tell me how much you agree with each of the following statements.

|      |                                                                                                                              | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|------|------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| 2.4a | I normally use the fastest mode of transport to get to a holiday destination quickly.                                        |                   |          |         |       |                |
| 2.4b | 'Low cost' airlines (e.g. easyJet) have enabled me to travel for holiday more frequently.                                    |                   |          |         |       |                |
| 2.4c | I normally choose a closer destination to home for my holiday so that I do not waste my limited vacation time on travelling. |                   |          |         |       |                |
| 2.4d | In general, I prefer having a vehicle (e.g. my own or rented car) for flexibility at the destination.                        |                   |          |         |       |                |
| 2.4e | I prefer walking and/or cycling whenever possible on holiday.                                                                |                   |          |         |       |                |
| 2.4f | I use public transport whenever possible on holiday.                                                                         |                   |          |         |       |                |
| 2.4g | If I need a car on holiday, I think it is better to hire an environmentally friendly car.                                    |                   |          |         |       |                |
| 2.4h | While on holiday, it is important to avoid highly carbon-intense modes of transport.                                         |                   |          |         |       |                |

### **PART III: Faster travel**

**Now, imagine there has been a technological improvement which enables you now to travel faster and/or cover longer distances within the same time when going on holiday. With this technology in place, you could save time from travel to/from a destination.**

3.1. With this technology in place, how would you, IN GENERAL, use the time savings from choosing faster travel to/from a holiday destination? Please tell me how much you agree with each of the following statements.

|      | Please tick one box each row                                                                             | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|------|----------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| 3.1a | This technology would enable me to travel longer distances (outside Europe) for holiday.                 |                   |          |         |       |                |
| 3.1b | This technology would enable me to travel longer distances (outside Europe) MORE FREQUENTLY for holiday. |                   |          |         |       |                |
| 3.1c | I would travel SHORTER distances but more frequently for holiday.                                        |                   |          |         |       |                |
| 3.1d | I would travel more frequently for holidays in general.                                                  |                   |          |         |       |                |
| 3.1e | With the saved time, I would be happy to spend more time AT THE DESTINATION.                             |                   |          |         |       |                |
| 3.1f | I would engage in more activities/ attractions at the destination.                                       |                   |          |         |       |                |
| 3.1g | The time savings offered by this technology would NOT change my current travel behaviour.                |                   |          |         |       |                |

Now, let's think about this technology with an example.

Imagine you are going on holiday to a Mediterranean destination flying from London.



With this faster travel technology in place, instead of travelling from London to the destination for 4 hours one way, you could travel in 2 hours one way. That is, you could save 4 hours of travel time ( $2+2=4$  hours for return) in total.

3.2. Considering the example given above, please tell me how much you agree with each of the following statements.

|                                                |                                                                                                                                                     | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| With this faster travel technology in place... |                                                                                                                                                     |                   |          |         |       |                |
| 3.2a                                           | I would still go to the same destination and use the time saved from travel to do something at the destination.                                     |                   |          |         |       |                |
| 3.2b                                           | I would still go to the same destination, but use the time saved from travel to do something in/around home before departure and after the holiday. |                   |          |         |       |                |
| 3.2c                                           | I would travel to the same destination but more frequently.                                                                                         |                   |          |         |       |                |
| 3.2d                                           | I would go to a new destination which is further away.                                                                                              |                   |          |         |       |                |
| 3.2e                                           | I would travel more frequently regardless of the travel distance to destinations.                                                                   |                   |          |         |       |                |

3.3. With this technology in place, if you had the saved time of 4 hours to spend at the destination, what would you most likely do, subject to reasonable cost? Please tick one box in each row, considering the example given above.

|      |                                                                                                          | Least likely | Less likely | Neutral | More likely | Most likely |
|------|----------------------------------------------------------------------------------------------------------|--------------|-------------|---------|-------------|-------------|
| 3.3a | I would go sightseeing around the place.                                                                 |              |             |         |             |             |
| 3.3b | I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). |              |             |         |             |             |
| 3.3c | I would just relax in/around my holiday accommodation.                                                   |              |             |         |             |             |
| 3.3d | I would go somewhere to eat/drink.                                                                       |              |             |         |             |             |
| 3.3e | I would visit another place (i.e. a nearby town/city).                                                   |              |             |         |             |             |

3.4. With this technology in place, how much more (if at all) would you be willing to pay for faster travel, if the original flight fare for the round trip (to/from the Mediterranean destination) was £150?

- |                                                    |                                                          |
|----------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> None                      | <input type="checkbox"/> £91-120 (61-80% more)           |
| <input type="checkbox"/> £1 - £30 (Up to 20% more) | <input type="checkbox"/> £121-£150 (81-100% more)        |
| <input type="checkbox"/> £31-£60 (20-40% more)     | <input type="checkbox"/> More than £150 (more than 100%) |
| <input type="checkbox"/> £61-£90 (41-60% more)     |                                                          |

3.5. Please tell me the importance of each factor to you when considering taking this faster transport option.

|      | Please tick one box each row.           | Very<br>unimportant | Unimportant | Neutral | Important | Very<br>important |
|------|-----------------------------------------|---------------------|-------------|---------|-----------|-------------------|
| 3.5a | The mode of transport                   |                     |             |         |           |                   |
| 3.5b | Whom I travel with                      |                     |             |         |           |                   |
| 3.5c | What the destination offers to tourists |                     |             |         |           |                   |
| 3.5d | My length of stay at the destination    |                     |             |         |           |                   |
| 3.5e | Cost of faster travel                   |                     |             |         |           |                   |

3.6. If you had the saved time to spend in/around HOME before departure and after return, how would you use it? Please tell me how much you agree with each of the following statements.

|      |                                                                                             | Strongly<br>disagree | Disagree | Neutral | Agree | Strongly<br>agree |
|------|---------------------------------------------------------------------------------------------|----------------------|----------|---------|-------|-------------------|
| 3.6a | I would spend this extra time for shopping to get better prepared for my holiday.           |                      |          |         |       |                   |
| 3.6b | I would spend this extra time at home to rest and/or for personal care (e.g. bath).         |                      |          |         |       |                   |
| 3.6c | I would spend this extra time at home to do house work (e.g. laundry, cleaning, gardening). |                      |          |         |       |                   |

#### **PART IV: About you**

**Lastly, this part asks you to provide information about yourself. Please note that your personal data will not be passed on to anyone else and that you will never be identified.**

4.1. Which of the following best describes your age range?

- ☐ 18-27
 ☐ 38-47
 ☐ 58-67  
☐ 28-37
 ☐ 48-57
 ☐ 68 and above

4.2. How do you personally describe your gender identity?



- ☐ Female
- ☐ Male
- ☐ Prefer to self-describe as ( )
- ☐ Prefer not to say

4.3. Which of the following best describes your household income?

- ☐ Below £12,500      ☐ £20,001-£30,000      ☐ £40,001-£50,000
- ☐ £12,501-£20,000      ☐ £30,001-£40,000      ☐ Above £50,000

4.4. Please specify your nationality.

( )

4.5. Which of the following best describes your current employment status?

- ☐ Employed (full-time)
- ☐ Employed (part-time)
- ☐ Unemployed and currently looking for work
- ☐ Unemployed and not currently looking for work
- ☐ Student
- ☐ Retired
- ☐ Homemaker (full-time)
- ☐ Homemaker (part-time)
- ☐ Self-employed (full-time)
- ☐ Self-employed (part-time)
- ☐ Unable to work

## Appendix 5 Participant Information Sheet for survey participants



### Participant Information Sheet

#### ***“Time use and holidays”***

#### **What is the purpose of the research/questionnaire?**

Research suggests that people experience time differently, depending on the context. When it comes to tourism, for instance, time is considered a key resource. For example, the amount of time available to tourists can affect their length of stay at a holiday destination. Although the importance of time in tourism has long been recognised, there has been a lack of research on this subject. Thus, this project aims to find out the impacts of time on tourists' holiday experiences while being en-route (i.e. when travelling to/from a destination) and while being on-site (i.e. at a destination). To this end, this project seeks to understand how tourists feel about time when going on holiday. This research seeks to fill the current gap in knowledge and contribute to tourism policies and managerial practice by providing important implications.

#### **Why have I been chosen?**

You have been chosen to participate because you are based in the UK, and you have travelled at least once over the last 12 months for holiday purposes, either within the UK or overseas.

#### **Do I have to take part?**

It is up to you to decide whether or not to take part. If you do decide to take part, you will have access to this information sheet to read. You can withdraw from participation at any time and without giving a reason, simply by closing the browser page. Please note that once you have completed and submitted your survey responses, we are unable to remove your anonymised responses from the study.

#### **How long will the questionnaire/online survey take to complete?**

The following questionnaire will require approximately 10 minutes to complete. Please complete all the parts of the questionnaire.

#### **What are the advantages and possible disadvantages or risks of taking part?**

It is hoped that this work will help in better understanding of tourists' holiday experiences that contributes to knowledge for sustainable tourism development. Participating in the research is not expected to cause you any disadvantages or risks.

#### **What type of information will be sought from me and why is the collection of this information relevant for achieving the research project's objectives?**

We will ask you about your recent holiday experiences and your feelings about time in the context of holidays. The information collected will be part of data that will answer the research questions.

### **Use of my information**

Participation in this study is on the basis of consent: you do not have to complete the survey, and you can change your mind at any point before submitting the survey responses. We will use your data on the basis that it is necessary for the conduct of research, which is an activity in the public interest. We put safeguards in place to ensure that your responses are kept secure and only used as necessary for this research study and associated activities such as a research audit. Once you have submitted your survey response, it will not be possible for us to remove it from the study analysis because you will not be identifiable.

The information collected may be used in an anonymous form to support other research projects in the future and access to it in this form will not be restricted. It will not be possible for you to be identified from this data. Anonymised data will be added to BU's Data Repository (a central location where data is stored) and which will be publicly available.

### **Contact for further information**

If you have any questions or would like further information, please contact Soheon Kim [skim@bournemouth.ac.uk](mailto:skim@bournemouth.ac.uk).

### *In case of complaints*

Any concerns about the study should be directed to Soheon Kim [skim@bournemouth.ac.uk](mailto:skim@bournemouth.ac.uk). If your concerns have not been answered by Soheon Kim, you should contact Professor Michael Silk, Deputy Dean for Research & Professional Practice in the Faculty of Management, Bournemouth University by email to [researchgovernance@bournemouth.ac.uk](mailto:researchgovernance@bournemouth.ac.uk).

### **Consent to Participate\***

By clicking FINISH to submit at the end of the survey, I am consenting to participate in this survey.

**Thank you for considering taking part in this research project.**

# Appendix 6 Identified themes in Phase I and development of measures for a questionnaire survey for Phase II

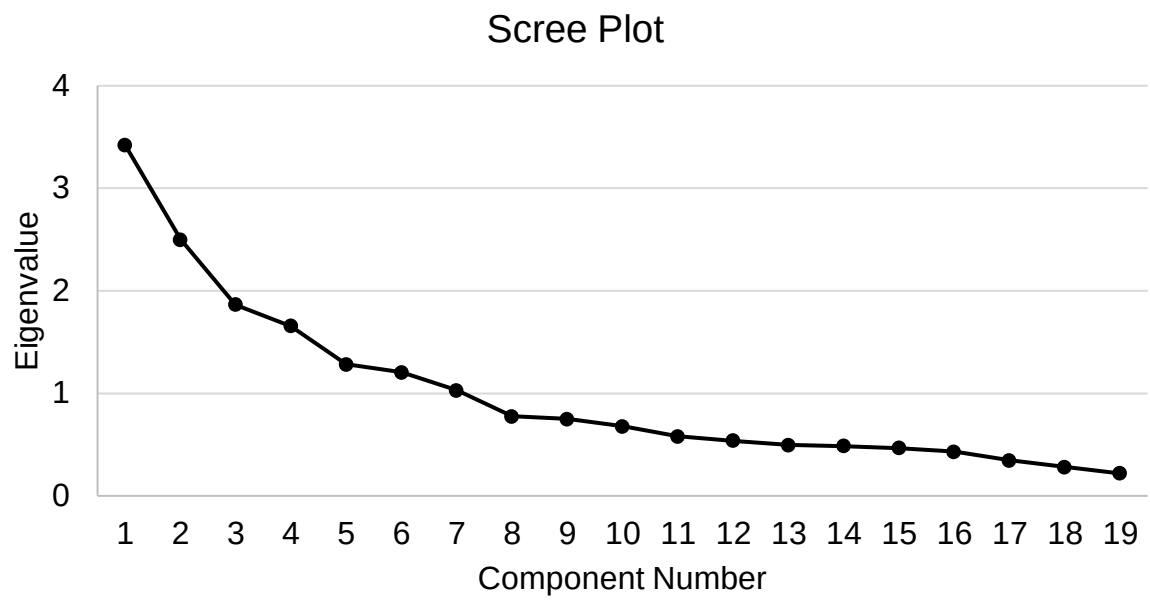
| Phase I interview findings       |                                                     |                                          | Phase II questionnaire design |                                                                                              |                       |                  |                                                                                    |
|----------------------------------|-----------------------------------------------------|------------------------------------------|-------------------------------|----------------------------------------------------------------------------------------------|-----------------------|------------------|------------------------------------------------------------------------------------|
| Theme                            | Sub-theme                                           | Codes                                    | Measure category              | Measuring concept                                                                            | Part of questionnaire | Measure items    |                                                                                    |
| Environmental impacts of tourism | Tourists' pro-environmental awareness and attitudes | Solid waste, transport-related emissions | Psychological values          | Choice of environmentally friendly transport                                                 | PART II               | 2.4g; 2.4h       |                                                                                    |
|                                  | Tourists' travel behaviour                          | Air travel                               |                               |                                                                                              |                       |                  |                                                                                    |
| Perceived speed of time passage  | Unfamiliarity                                       | Novelty of experience                    |                               | Time passing on holiday<br>Travel time for holiday<br>Time spending on-site<br>Time fluidity |                       | PART II          | 2.1a; 2.1b; 2.1e<br>2.2a; 2.2b; 2.2c; 2.2d<br>2.2e; 2.2f; 2.2g; 2.2h<br>2.1c; 2.1d |
|                                  | Routine tasks                                       | Work, study, parental tasks              |                               |                                                                                              |                       |                  |                                                                                    |
|                                  | Emotions/time awareness                             | Enjoyment, track of time                 |                               |                                                                                              |                       |                  |                                                                                    |
|                                  | Lack of time pressure                               | Feeling free from time                   |                               |                                                                                              |                       |                  |                                                                                    |
| Perceived time en-route          | Travel experiences/ environments                    | On-board experience and environment      | Psychological values          | Faster travel*                                                                               | PART III              | 2.4a; 2.4b; 2.4c |                                                                                    |
|                                  | Emotional factors                                   | Travel to/from destination               |                               |                                                                                              |                       |                  |                                                                                    |
|                                  | Additional time required for travelling en-route    | Wasted, opportunity                      |                               |                                                                                              |                       |                  |                                                                                    |
|                                  |                                                     |                                          | Time use patterns en-site     |                                                                                              |                       |                  |                                                                                    |

|                             |                                           |                                                                      |                           |                                             |          |                                                   |
|-----------------------------|-------------------------------------------|----------------------------------------------------------------------|---------------------------|---------------------------------------------|----------|---------------------------------------------------|
| Time use on-site            | Tourist experiences                       | Maximising experience, time allocation on activities, quality time   | Time use patterns on-site | Activities and experiences<br>Time planning |          | 2.3a; 2.3b;<br>2.3c                               |
|                             | Accessibility/<br>flexibility on the move | Car use                                                              |                           | Travel on-site                              |          | 2.4d; 2.4e;<br>2.4f                               |
| Potential TREs              | Travel distance                           | Release from temporal and spatial constraints                        | TRE                       | TRE en-route                                | PART III | 3.1a; 3.1b;<br>3.1c; 3.1d;<br>3.1g                |
|                             | Travel frequency                          | Frequent short trips                                                 |                           | TRE on-site                                 |          | 3.3a; 3.3b;<br>3.3c; 3.3d;<br>3.3e; 3.1e;<br>3.1f |
|                             | Change of transport mode                  | Choice of a faster travel option                                     |                           | TRE destination choices                     |          | 3.2a; 3.2b;<br>3.2c; 3.2d;<br>3.2e                |
|                             | Length of stay and changes in activities  | Longer stay, opportunities for extra activities on-site              |                           | TRE other sites*                            |          | 3.6a; 3.6b;<br>3.6c                               |
|                             |                                           |                                                                      |                           | New travel context WTP                      |          | 3.5a; 3.5b;<br>3.5c; 3.5d;<br>3.5e<br>3.4.        |
|                             | Influential factors                       | Cost effect, time coordination, physical and psychological wellbeing |                           |                                             |          |                                                   |
| Influential factors in time | Tourist socio-demographic characteristics | Age, employment status, having children                              | Travel context            | Socio-demographic characteristics           | PART IV  | 4.1.; 4.2.;<br>4.4.; 4.5.                         |

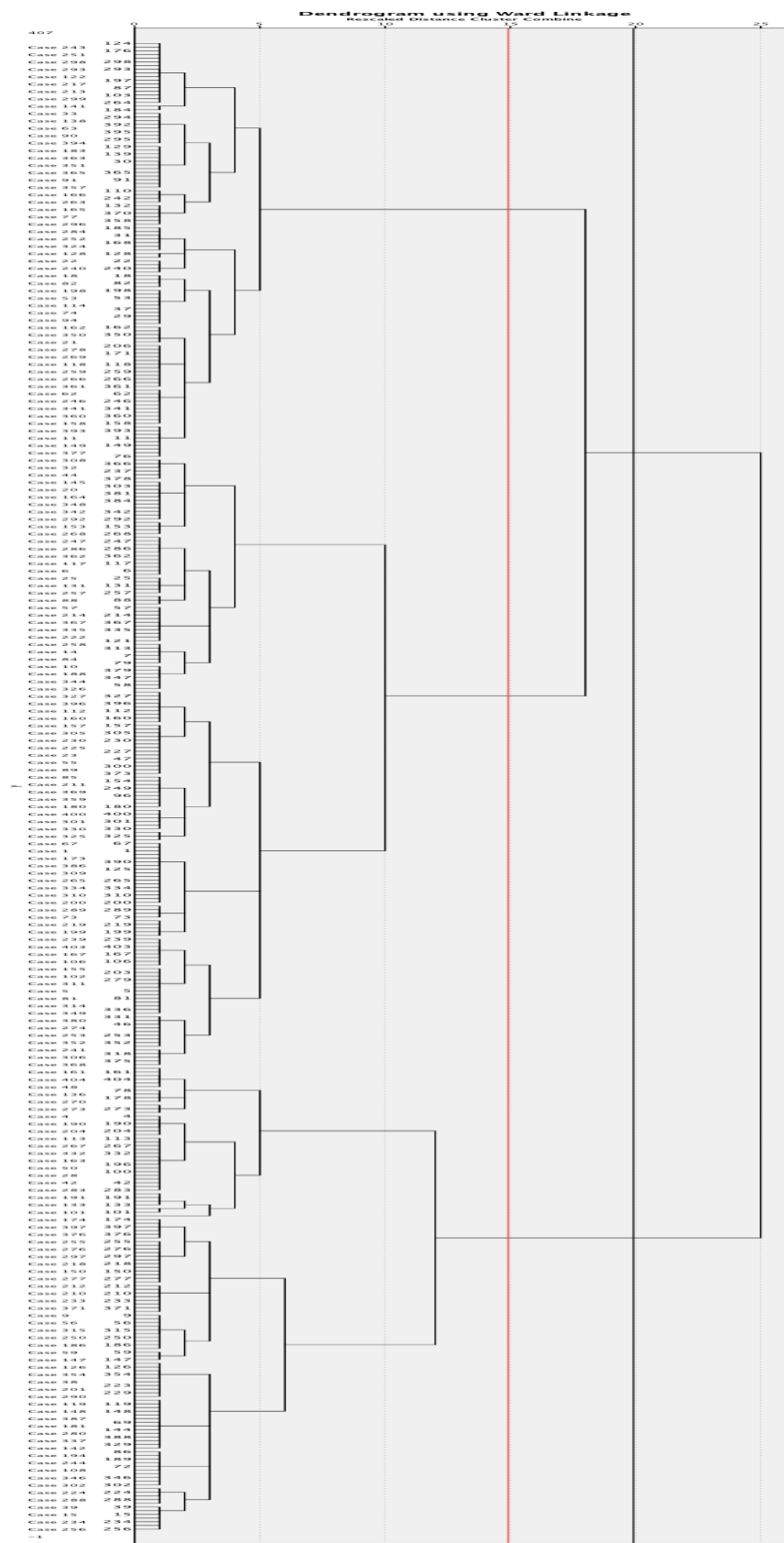
|                    |                |                                                                |                |                                                           |               |                                                                                                                           |
|--------------------|----------------|----------------------------------------------------------------|----------------|-----------------------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------|
| perception and use |                |                                                                | Availability   | Time available for holiday<br>Money available for holiday | PART I and IV | 1.8a; 1.8b;<br>1.8c<br>4.3.                                                                                               |
|                    | Travel context | Length of stay, trip purpose, travel party, first/repeat visit | Travel context | Holiday preferences<br>Recent holiday experiences         | PART I        | 1.1.; 1.2.;<br>1.3.; 1.4.;<br>1.5.; 1.6.;<br>1.7a; 1.7b;<br>1.9a; 1.9b;<br>1.9c; 1.10.;<br>1.11.; 1.12.;<br>1.13.; 1.14.; |

Note1: Measurement scales added to fill the gap in relation to concepts that were rather implicitly discussed in the interviews but not identified as a sub-theme in the final analysis; however, topical and contextual relevance was identified.

## Appendix 7 Scree plot



## Appendix 8 Dendrogram





## Appendix 9 Agglomeration schedule

| Agglomeration Schedule |                  |           |              |                             |           |            |
|------------------------|------------------|-----------|--------------|-----------------------------|-----------|------------|
| Stage                  | Cluster Combined |           | Coefficients | Stage Cluster First Appears |           | Next Stage |
|                        | Cluster 1        | Cluster 2 |              | Cluster 1                   | Cluster 2 |            |
| 1                      | 124              | 243       | 0.809        | 0                           | 0         | 269        |
| 2                      | 34               | 297       | 2.230        | 0                           | 0         | 88         |
| 3                      | 45               | 148       | 3.867        | 0                           | 0         | 41         |
| 4                      | 316              | 341       | 5.725        | 0                           | 0         | 16         |
| 5                      | 11               | 317       | 7.785        | 0                           | 0         | 47         |
| 6                      | 172              | 253       | 9.850        | 0                           | 0         | 175        |
| 7                      | 152              | 246       | 11.977       | 0                           | 0         | 206        |
| 8                      | 118              | 177       | 14.152       | 0                           | 0         | 52         |
| 9                      | 50               | 100       | 16.595       | 0                           | 0         | 158        |
| 10                     | 197              | 217       | 19.134       | 0                           | 0         | 34         |
| .                      | .                | .         | .            | .                           | .         | .          |
| .                      | .                | .         | .            | .                           | .         | .          |
| .                      | .                | .         | .            | .                           | .         | .          |
| 390                    | 15               | 38        | 5015.529     | 381                         | 336       | 399        |
| 391                    | 4                | 13        | 5097.550     | 377                         | 386       | 395        |
| 392                    | 30               | 52        | 5180.663     | 383                         | 356       | 396        |
| 393                    | 6                | 20        | 5279.790     | 387                         | 372       | 400        |
| 394                    | 2                | 22        | 5379.767     | 388                         | 378       | 396        |
| 395                    | 4                | 16        | 5488.605     | 391                         | 374       | 401        |
| 396                    | 2                | 30        | 5601.431     | 394                         | 392       | 402        |
| 397                    | 1                | 5         | 5721.025     | 376                         | 379       | 398        |
| 398                    | 1                | 12        | 5841.643     | 397                         | 385       | 400        |
| 399                    | 3                | 15        | 5977.765     | 389                         | 390       | 401        |
| 400                    | 1                | 6         | 6235.709     | 398                         | 393       | 402        |
| 401                    | 3                | 4         | 6534.331     | 399                         | 395       | 403        |
| 402                    | 1                | 2         | 6999.363     | 400                         | 396       | 403        |
| 403                    | 1                | 3         | 7657.000     | 402                         | 401       | 0          |

## Appendix 10 Psychological values and time use patterns: a comparison by cluster

| Statement by Factor                                                                                                                   | Outcome of Kruskal-Wallis test & Post-hoc test comparison groups            | Result (Mean rank)                                                                             | Agreement <sup>a</sup> |
|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------|
| Psychological values                                                                                                                  |                                                                             |                                                                                                |                        |
| F1 PTT                                                                                                                                |                                                                             |                                                                                                |                        |
| 2.2a. Travel to/from a holiday destination is fun and makes an enjoyable part of my holiday.                                          | X <sup>2</sup> (2)=152.633<br>p<0.001<br><br>2-1 (p<0.001)<br>3-1 (p<0.001) | Cluster 1 (285.12) agreed to this statement significantly more than 2 (144.42) and 3 (146.39). | Cluster 1              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 2              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 3              |
| 2.2b. I enjoy any additional time required for reaching the destination, such as waiting time at the airport or waiting for transfer. | X <sup>2</sup> (2)=138.770<br>p<0.001<br><br>2-1 (p<0.001)<br>3-1 (p<0.001) | Cluster 1 (281.12) agreed to this statement significantly more than 2 (141.72) and 3 (154.06). | Cluster 1              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 2              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 3              |
| 2.2c. Travel to/from a holiday destination is a necessary evil.                                                                       | X <sup>2</sup> (2)=109.694<br>p<0.001<br><br>1-3 (p<0.001)<br>1-2 (p<0.001) | Cluster 1 (133.64) agreed to this statement significantly less than 2 (258.53) and 3 (242.42). | Cluster 1              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 2              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 3              |
| 2.2d. My holiday only starts when I arrive at the destination.                                                                        | X <sup>2</sup> (2)=107.208<br>p<0.001<br><br>1-3 (p<0.001)<br>1-2 (p<0.001) | Cluster 1 (133.80) agreed to this statement significantly less than 2 (262.86) and 3 (238.33). | Cluster 1              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 2              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 3              |
| F2 PTP                                                                                                                                |                                                                             |                                                                                                |                        |
| 2.1a. Time seemed to fly when I was doing something new on holiday.                                                                   | X <sup>2</sup> (2)=76.785<br>p<0.001<br><br>3-1 (p<0.001)<br>3-2 (p<0.001)  | Cluster 3 (135.56) agreed to this statement significantly less than 1 (225.14) and 2 (244.08). | Cluster 1              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 2              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 3              |
| 2.1b. I felt time was going faster when I was doing something enjoyable on holiday.                                                   | X <sup>2</sup> (2)=65.175<br>p<0.001<br><br>3-1 (p<0.001)<br>3-2 (p<0.001)  | Cluster 3 (139.61) agreed to this statement significantly less than 1 (226.11) and 2 (238.15). | Cluster 1              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 2              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 3              |
| 2.1c. The holiday time seemed to never end at the beginning of holiday.                                                               | X <sup>2</sup> (2)=12.961<br>p=0.002<br><br>1-3 (p=0.001)                   | Cluster 3 (230.77) agreed to this statement significantly more than 1 (183.03).                | Cluster 1              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 2              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 3              |
|                                                                                                                                       |                                                                             |                                                                                                | Cluster 1              |

|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 2.1e. At the end of holiday, I felt time had gone by so quickly.                                                                                                          | X <sup>2</sup> (2)=44.296<br>p<0.001                                                        | Cluster 3 (149.99) agreed to this statement significantly less than 1 (228.90) and 2 (222.51).                                                               | Cluster 2 |
|                                                                                                                                                                           | 3-2 (p<0.001)<br>3-1 (p<0.001)                                                              |                                                                                                                                                              | Cluster 3 |
| F3 MTO                                                                                                                                                                    |                                                                                             |                                                                                                                                                              |           |
| 2.2f. I want to see as many things and do as many activities and experiences as possible when on holiday.                                                                 | X <sup>2</sup> (2)=88.018<br>p<0.001<br><br>3-1 (p<0.001)<br>3-2 (p<0.001)<br>1-2 (p=0.048) | Cluster 3 (127.96) agreed to this statement significantly less than 1 (222.97) and 2 (255.72); Cluster 1 agreed to this statement significantly less than 2. | Cluster 1 |
|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              | Cluster 2 |
|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              | Cluster 3 |
| 2.2h. There are so many things I want to do during my holiday, so I often feel time is running out at the end of holiday.                                                 | X <sup>2</sup> (2)=85.764<br>p<0.001<br><br>3-1 (p<0.001)<br>3-2 (p<0.001)<br>1-2 (p=0.009) | Cluster 3 (129.58) agreed to this statement significantly less than 1 (219.08) and 2 (259.59); Cluster 1 agreed to this statement significantly less than 2. | Cluster 1 |
|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              | Cluster 2 |
|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              | Cluster 3 |
| 2.3a. At the beginning of holiday, I find it hard to schedule my holiday activities in a timely manner because there are so many things to do and see at the destination. | X <sup>2</sup> (2)=97.470<br>p<0.001<br><br>3-1 (p<0.001)<br>3-2 (p<0.001)<br>1-2 (p<0.001) | Cluster 3 (135.60) agreed to this statement significantly less than 1 (202.75) and 2 (276.73); Cluster 1 agreed to this statement significantly less than 2. | Cluster 1 |
|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              | Cluster 2 |
|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              | Cluster 3 |
| F7 QT                                                                                                                                                                     |                                                                                             |                                                                                                                                                              |           |
| 2.2g. I want to enjoy quality time on holiday, rather than rushing around, to see or visit most of the things the destination offers.                                     | X <sup>2</sup> (2)=18.062<br>p<0.001<br><br>2-1 (p=0.048)<br>2-3 (p<0.001)                  | Cluster 2 (171.91) agreed to this statement significantly less than 1 (202.75) and 3 (229.61).                                                               | Cluster 1 |
|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              | Cluster 2 |
|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              | Cluster 3 |
| Time use patterns                                                                                                                                                         |                                                                                             |                                                                                                                                                              |           |
| F4 TTO                                                                                                                                                                    |                                                                                             |                                                                                                                                                              |           |
| 2.4d. In general, I prefer having a vehicle (e.g. my own or rented car) for flexibility at the destination.                                                               | -                                                                                           | -                                                                                                                                                            | Cluster 1 |
|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              | Cluster 2 |
|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              | Cluster 3 |
| 2.4e. I prefer walking and/or cycling                                                                                                                                     | -                                                                                           | -                                                                                                                                                            | Cluster 1 |
|                                                                                                                                                                           |                                                                                             |                                                                                                                                                              | Cluster 2 |

|                                                                                                 |                                                                            |                                                                                                |           |
|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------|
| whenever possible on holiday.                                                                   |                                                                            |                                                                                                | Cluster 3 |
| 2.4f. I use public transport whenever possible on holiday.                                      | X <sup>2</sup> (2)=12.926<br>p=0.002<br><br>3-2 (p=0.047)<br>3-1 (p=0.001) | Cluster 3 (173.49) agreed to this statement significantly less than 1 (220.39) and 2 (208.73). | Cluster 1 |
|                                                                                                 |                                                                            |                                                                                                | Cluster 2 |
|                                                                                                 |                                                                            |                                                                                                | Cluster 3 |
| F5 STO                                                                                          |                                                                            |                                                                                                |           |
| 2.3b. When on holiday, I have to follow time schedules or plans.                                | X <sup>2</sup> (2)=30.932<br>p<0.001<br><br>3-2 (p<0.001)<br>1-2 (p=0.001) | Cluster 2 (247.46) agreed to this statement significantly more than 1 (197.86) and 3 (168.26). | Cluster 1 |
|                                                                                                 |                                                                            |                                                                                                | Cluster 2 |
|                                                                                                 |                                                                            |                                                                                                | Cluster 3 |
| 2.3c. When on holiday, I have flexibility of changing schedules and plans as I want.            | X <sup>2</sup> (2)=9.164<br>p=0.010<br><br>2-3 (p=0.008)                   | Cluster 2 (180.09) agreed to this statement significantly less than 3 (220.12).                | Cluster 1 |
|                                                                                                 |                                                                            |                                                                                                | Cluster 2 |
|                                                                                                 |                                                                            |                                                                                                | Cluster 3 |
| F6 TTE                                                                                          |                                                                            |                                                                                                |           |
| 2.4a. I normally use the fastest mode of transport to get to a holiday destination quickly.     | X <sup>2</sup> (2)=8.279<br>p=0.016<br><br>1-2 (p=0.012)                   | Cluster 2 (224.93) agreed to this statement significantly more than 1 (186.46).                | Cluster 1 |
|                                                                                                 |                                                                            |                                                                                                | Cluster 2 |
|                                                                                                 |                                                                            |                                                                                                | Cluster 3 |
| 2.4b. 'Low cost' airlines (e.g. easyJet) have enabled me to travel for holiday more frequently. | X <sup>2</sup> (2)=26.836<br>p<0.001<br><br>3-1 (p=0.004)<br>3-2 (p<0.001) | Cluster 3 (163.72) agreed to this statement significantly less than 1 (207.11) and 2 (239.01). | Cluster 1 |
|                                                                                                 |                                                                            |                                                                                                | Cluster 2 |
|                                                                                                 |                                                                            |                                                                                                | Cluster 3 |

a. In Agreement, Blue colour for agreed and Orange colour for disagreed.

## Appendix 11 Time availability and the potential TREs

| Time availability                                                         | TRE statement with significant differences (p<0.05)                                                            | Outcome of Mann-Whitney U test (N= including agreed and disagreed)  | Result                                                                                                                                     | Agreement <sup>a</sup>              |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| In general, I have enough free time for holiday travel.                   | TRE destination choices                                                                                        |                                                                     |                                                                                                                                            |                                     |
|                                                                           | 3.2c. I would travel to the same destination but more frequently.                                              | U(Nenough time=296, no enough time=67) =7620.500, z=-3.104, p=0.002 | Respondents who had enough time for holiday (174.24) agreed to this statement significantly less than those who did not (216.26).          | Enough time for holiday             |
|                                                                           |                                                                                                                |                                                                     |                                                                                                                                            | No enough time for holiday          |
| When on holiday, I normally have enough time to manage everything I want. | TRE on-site                                                                                                    |                                                                     |                                                                                                                                            |                                     |
|                                                                           | 3.1f. I would engage in more activities/ attractions at the destination.                                       | U(Nenough=308, Nno enough time=48) =5654.000, z=-2.792, p=0.005     | Respondents who had enough time to manage everything (172.86) agreed to this statement significantly less than those who did not (214.71). | Enough time to manage everything    |
|                                                                           |                                                                                                                |                                                                     |                                                                                                                                            | No enough time to manage everything |
|                                                                           | 3.3b. I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). | U(N=356) =5727.000, z=-2.583, p=0.010                               | Respondents who had enough time to manage everything (173.09) agreed to this statement significantly less than those who did not (213.19). | Enough time to manage everything    |
|                                                                           |                                                                                                                |                                                                     |                                                                                                                                            | No enough time to manage everything |
|                                                                           | 3.3e. I would visit another place (i.e. a nearby town/city).                                                   | U(N=356) =5533.500, z=-2.937, p=0.003                               | Respondents who had enough time to manage everything (172.47) agreed to this statement significantly less than those who did not (217.22). | Enough time to manage everything    |
|                                                                           |                                                                                                                |                                                                     |                                                                                                                                            | No enough time to manage everything |
|                                                                           | TRE destination choices                                                                                        |                                                                     |                                                                                                                                            |                                     |

|                                                                                                                 |                                                                                         |                                                                        |                                                                                                                                                     |                 |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| With limited vacation time, I prefer taking frequent short breaks in a year, instead of a single, long holiday. | 3.2c. I would travel to the same destination but more frequently.                       | U(Nshort breaks=158, Na long holiday=142) =12754.000, z=2.140, p=0.032 | Respondents who preferred taking frequent short breaks (160.22) agreed to this statement significantly more than those who did not prefer (139.68). | Short breaks    |
|                                                                                                                 |                                                                                         |                                                                        |                                                                                                                                                     | No short breaks |
|                                                                                                                 | 3.2d. I would go to a new destination which is further away.                            | U(N=300) =12620.500, z=1.999, p=0.046                                  | Respondents who preferred taking frequent short breaks (159.38) agreed to this statement significantly more than those who did not prefer (140.62). | Short breaks    |
|                                                                                                                 |                                                                                         |                                                                        |                                                                                                                                                     | No short breaks |
|                                                                                                                 | 3.2e. I would travel more frequently regardless of the travel distance to destinations. | U(N=300) =13533.000, z=3.211, p=0.001                                  | Respondents who preferred taking frequent short breaks (165.15) agreed to this statement significantly more than those who did not prefer (134.20). | Short breaks    |
|                                                                                                                 |                                                                                         |                                                                        |                                                                                                                                                     | No short breaks |
|                                                                                                                 | TRE en-route                                                                            |                                                                        |                                                                                                                                                     |                 |
|                                                                                                                 | 3.1c. I would travel shorter distances but more frequently for holiday.                 | U(N=300) =13270.500, z=2.845, p=0.004                                  | Respondents who preferred taking frequent short breaks (163.49) agreed to this statement significantly more than those who did not prefer (136.05). | Short breaks    |
|                                                                                                                 |                                                                                         |                                                                        |                                                                                                                                                     | No short breaks |

a. In Agreement, Blue colour for agreed, Orange colour for disagreed, Yellow for neutral.

## Appendix 12 Household income and the potential TREs

| TRE statement                                                                                                  | Outcome of Kruskal-Wallis test & Post-hoc test comparison groups                                                 | Result                                                                                                                                     | Agreement <sup>a</sup> |
|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| TRE en-route                                                                                                   |                                                                                                                  |                                                                                                                                            |                        |
| 3.1b. This technology would enable me to travel longer distances (outside Europe) more frequently for holiday. | $\chi^2(5)=15.411$ ,<br>$p=0.009$<br><br>Post-hoc test outcome: £30,001-£40,000 with Above £50,000 ( $p=0.037$ ) | Respondents with income of above £50,000 agreed to this statement significantly more than those who made £30,001-£40,000 in the household. | Below £12,500          |
|                                                                                                                |                                                                                                                  |                                                                                                                                            | £12,501-£20,000        |
|                                                                                                                |                                                                                                                  |                                                                                                                                            | £20,001-£30,000        |
|                                                                                                                |                                                                                                                  |                                                                                                                                            | £30,001-£40,000        |
|                                                                                                                |                                                                                                                  |                                                                                                                                            | £40,001-£50,000        |
|                                                                                                                |                                                                                                                  |                                                                                                                                            | £50,000 and above      |
| 3.1c. I would travel shorter distances but more frequently for holiday.                                        | $\chi^2(5)=15.804$<br>$p=0.007$<br><br>Post-hoc test outcome: Above £50,000 with £20,001-£30,000 ( $p=0.008$ )   | Respondents with income of £20,001-£30,000 agreed to this statement significantly more than those who made above £50,000 in the household. | Below £12,500          |
|                                                                                                                |                                                                                                                  |                                                                                                                                            | £12,501-£20,000        |
|                                                                                                                |                                                                                                                  |                                                                                                                                            | £20,001-£30,000        |
|                                                                                                                |                                                                                                                  |                                                                                                                                            | £30,001-£40,000        |
|                                                                                                                |                                                                                                                  |                                                                                                                                            | £40,001-£50,000        |
|                                                                                                                |                                                                                                                  |                                                                                                                                            | £50,000 and above      |

a. In Agreement, Blue colour for agreed and Orange colour for disagreed.

### Appendix 13 Correlation coefficient between PTT and TRE destination choices and en-route

|                                                                                                                                       | TRE destination choices                                                                                                                                   |                                                                   | TRE en-route                                                                            |                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| PTT statement                                                                                                                         | 3.2b. I would still go to the same destination, but use the time saved from travel to do something in/around home before departure and after the holiday. | 3.2c. I would travel to the same destination but more frequently. | 3.2e. I would travel more frequently regardless of the travel distance to destinations. | 3.1c. I would travel shorter distances but more frequently for holiday. |
| 2.2a. Travel to/from a holiday destination is fun and makes an enjoyable part of my holiday.                                          | -                                                                                                                                                         | .148**                                                            | .156**                                                                                  | -                                                                       |
| 2.2b. I enjoy any additional time required for reaching the destination, such as waiting time at the airport or waiting for transfer. | .172**                                                                                                                                                    | .139**                                                            | .106*                                                                                   | .102*                                                                   |
| 2.2c. Travel to/from a holiday destination is a necessary evil.                                                                       | -                                                                                                                                                         | -.127*                                                            | -                                                                                       | -.125*                                                                  |
| 2.2d. My holiday only starts when I arrive at the destination.                                                                        | .127*                                                                                                                                                     | -                                                                 | -                                                                                       | -                                                                       |

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).



#### Appendix 14 Correlation coefficient between PTP and TRE on-site

| PTP statement                                                                       | TRE on-site                                                                        |                                                                          |                                                |                                                                                                                |                                                              |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
|                                                                                     | 3.1e. With the saved time, I would be happy to spend more time at the destination. | 3.1f. I would engage in more activities/ attractions at the destination. | 3.3a. I would go sightseeing around the place. | 3.3b. I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). | 3.3e. I would visit another place (i.e. a nearby town/city). |
| 2.1a. Time seemed to fly when I was doing something new on holiday.                 | .237**                                                                             | .287**                                                                   | .268**                                         | .229**                                                                                                         | .146**                                                       |
| 2.1b. I felt time was going faster when I was doing something enjoyable on holiday. | .224**                                                                             | .223**                                                                   | .202**                                         | .155**                                                                                                         | .147**                                                       |
| 2.1e. At the end of holiday, I felt time had gone by so quickly.                    | .205**                                                                             | .168**                                                                   | .130**                                         | -                                                                                                              | -                                                            |

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

## Appendix 15 Correlation coefficient between MTO and TRE on-site

| MTO statement                                                                                                                                                             | TRE on-site                                                                        |                                                                         |                                                |                                                                                                                |                                                              |                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|
|                                                                                                                                                                           | 3.1e. With the saved time, I would be happy to spend more time at the destination. | 3.1f. I would engage in more activities/attractions at the destination. | 3.3a. I would go sightseeing around the place. | 3.3b. I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). | 3.3c. I would just relax in/around my holiday accommodation. | 3.3e. I would visit another place (i.e. a nearby town/city). |
| 2.2f. I want to see as many things and do as many activities and experiences as possible when on holiday.                                                                 | .193**                                                                             | .365**                                                                  | .322**                                         | .381**                                                                                                         | -.223**                                                      | .292**                                                       |
| 2.2h. There are so many things I want to do during my holiday, so I often feel time is running out at the end of holiday.                                                 | .225**                                                                             | .396**                                                                  | .290**                                         | .261**                                                                                                         | -.172**                                                      | .263**                                                       |
| 2.3a. At the beginning of holiday, I find it hard to schedule my holiday activities in a timely manner because there are so many things to do and see at the destination. | -                                                                                  | .230**                                                                  | .209**                                         | .200**                                                                                                         | -.128*                                                       | .249**                                                       |

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

## Appendix 16 Correlation coefficient between QT and TRE on-site

| QT statement                                                                                                                          | TRE on-site                                                                                                    |                                                              |                                          |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------|
|                                                                                                                                       | 3.3b. I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). | 3.3c. I would just relax in/around my holiday accommodation. | 3.3d. I would go somewhere to eat/drink. |
| 2.2g. I want to enjoy quality time on holiday, rather than rushing around, to see or visit most of the things the destination offers. | -.172**                                                                                                        | .301**                                                       | .143**                                   |

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

## Appendix 17 Correlation coefficient between TTO and TRE on-site

| TTO statement                                                       | TRE on-site                                                               |                                                |                                                                                                                |                                                              |                                                               |
|---------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------|
|                                                                     | 3.1f. I would engage in more activities/ attractions at the destination . | 3.3a. I would go sightseeing around the place. | 3.3b. I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). | 3.3c. I would just relax in/around my holiday accommodation. | 3.3e. I would visit another place (i.e. a nearby town/city) . |
| 2.4e. I prefer walking and/or cycling whenever possible on holiday. | .177**                                                                    | .125*                                          | .132**                                                                                                         | -                                                            | .113*                                                         |
| 2.4f. I use public transport whenever possible on holiday.          | .104*                                                                     | .198**                                         | -                                                                                                              | -.115*                                                       | .105*                                                         |

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

## Appendix 18 Correlation coefficient between STO and TRE on-site

|                                                                                      | TRE on-site                                                                        |                                                                         |                                                |                                                                                                                |                                                              |                                                              |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|
| STO statement                                                                        | 3.1e. With the saved time, I would be happy to spend more time at the destination. | 3.1f. I would engage in more activities/attractions at the destination. | 3.3a. I would go sightseeing around the place. | 3.3b. I would do some adventure sports and activities (e.g. water sports, city river cruise, helicopter tour). | 3.3c. I would just relax in/around my holiday accommodation. | 3.3e. I would visit another place (i.e. a nearby town/city). |
| 2.3b. When on holiday, I have to follow time schedules or plans.                     | -                                                                                  | .239**                                                                  | .129**                                         | .111*                                                                                                          | -.100*                                                       | .123*                                                        |
| 2.3c. When on holiday, I have flexibility of changing schedules and plans as I want. | .136**                                                                             | -                                                                       | -                                              | -                                                                                                              | -                                                            | -                                                            |

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

# Appendix 19 Correlation coefficient between TTE and TRE destination choices and TRE en-route

|                                                                                                 | TRE destination choices                                           |                                                              |                                                                                         | TRE en-route                                                                                   |                                                                                                                |                                                                         |                                                               |                                                                                                 |
|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| TTE statement                                                                                   | 3.2c. I would travel to the same destination but more frequently. | 3.2d. I would go to a new destination which is further away. | 3.2e. I would travel more frequently regardless of the travel distance to destinations. | 3.1a. This technology would enable me to travel longer distances (outside Europe) for holiday. | 3.1b. This technology would enable me to travel longer distances (outside Europe) more frequently for holiday. | 3.1c. I would travel shorter distances but more frequently for holiday. | 3.1d. I would travel more frequently for holidays in general. | 3.1g. The time savings offered by this technology would not change my current travel behaviour. |
| 2.4a. I normally use the fastest mode of transport to get to a holiday destination quickly.     | -                                                                 | .280**                                                       | .141**                                                                                  | .347**                                                                                         | .289**                                                                                                         | -                                                                       | .133**                                                        | -.184**                                                                                         |
| 2.4b. 'Low cost' airlines (e.g. easyJet) have enabled me to travel for holiday more frequently. | .159*                                                             | .221**                                                       | .239**                                                                                  | .345**                                                                                         | .385**                                                                                                         | .114*                                                                   | .258**                                                        | -.195**                                                                                         |

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

## Appendix 20 Respondents' characteristics and TRE in/around home

|               | Age                  |        |               | Gender               |        |               | Employment status    |        |               |
|---------------|----------------------|--------|---------------|----------------------|--------|---------------|----------------------|--------|---------------|
| TRE statement | Outcome <sup>a</sup> | Result | Agreement (%) | Outcome <sup>b</sup> | Result | Agreement (%) | Outcome <sup>a</sup> | Result | Agreement (%) |

|                                                                                         |                                                                              |                                                                                                                                         |                                           |                                               |                                                                                                                                         |                                    |                                                                                                                                                                            |                                                                                                                                                                                                                                                                                        |                                                                                          |
|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 3.6a. I would spend this extra time for shopping to get better prepared for my holiday. | $X^2(4)=14.498$<br>$p=0.006$<br><br>58 and above with 18-27<br>( $p=0.009$ ) | Respondents who are 58 and above (Mean rank=174.15) agreed to this statement significantly less than those who are aged 18-27 (230.81). | 58 and above (14.9%)<br><br>18-27 (43.4%) | $U=17,678.000$ ,<br>$z=-2.394$ ,<br>$p=0.017$ | Female agreed to all statements (Mean rank=215.60, 213.22, 220.35, respectively) significantly more than males (188.74, 191.23, 183.75) | Female (33.3%)<br><br>Male (21.9%) | Significant $X^2(5)=19.416$<br>$p=0.002$<br><br>Retired with full-time ( $p=0.048$ )<br><br>Retired with student ( $p=0.001$ )<br><br>Part time with student ( $p=0.042$ ) | Retired respondents (Mean rank=159.43) agreed to this statement significantly less than those who are full-time committed (209.51) or student (267.16).<br><br>Part-time (191.71) committed respondents agreed to this statement significantly less than student (267.16) respondents. | Retired (14.0%)<br><br>Full-time (29.2%)<br><br>Student (56.0%)<br><br>Part-time (25.2%) |
|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|



|                                                                                           |                                |                                                                                         |                                                                                                                         |                                         |  |                                          |                                                                                                                                            |                                                                                                                                                         |                                                                          |
|-------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 3.6b. I would spend this extra time at home to rest and/or for personal care (e.g. bath). | $\chi^2(4)=9.938$<br>$p=0.041$ | There was no significant difference in responses to the statement among the age groups. | 18-27<br>(59.4%)<br><br>28-37<br>(57.6%)<br><br>38-47<br>(56.0%)<br><br>48-57<br>(51.5%)<br><br>58 and above<br>(42.2%) | U=18,169.500,<br>z=-2.008,<br>$p=0.045$ |  | Female<br>(57.5%)<br><br>Male<br>(46.2%) | Significant<br>$\chi^2(5)=12.156$<br>$p=0.033$<br><br>Retired with student<br>( $p=0.018$ )<br><br>Full-time with student<br>( $p=0.046$ ) | Student respondents (Mean rank=266.60) agreed to this statement significantly more than those who are retired (180.90) or full-time committed (197.28). | Student<br>(80.0%)<br><br>Retired<br>(42.2%)<br><br>Full-time<br>(49.5%) |
|-------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|

|                                                                                                    |                                      |                                                                                                                                                                                         |                      |                                       |  |                |   |                 |                        |
|----------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------------------------|--|----------------|---|-----------------|------------------------|
| 3.6c. I would spend this extra time at home to do house work (e.g. laundry, cleaning, gardenin g). | X <sup>2</sup> (4)=24.038<br>p<0.001 | Respondents who are 58 (Mean rank=165.48) and above agreed to this statement significantly less than those who are in the age groups of 18-27 (223.60), 28-37 (238.92), 38-47 (214.25). | 58 and above (20.7%) | U=16,695.500,<br>z=-3.250,<br>p=0.001 |  |                |   | Not significant | Full-time (37.5%)      |
|                                                                                                    | 58 and above with 18-27 (p=0.007)    |                                                                                                                                                                                         | 18-27 (45.5%)        |                                       |  |                |   |                 | Part-time (36.4%)      |
|                                                                                                    | 58 and above with 28-37 (p<0.001)    |                                                                                                                                                                                         | 28-37 (56.2%)        |                                       |  |                |   |                 | Unempl oyed (52.1%)    |
|                                                                                                    | 58 and above with 38-47 (p=0.034)    |                                                                                                                                                                                         | 38-47 (46.6%)        |                                       |  |                |   |                 | Student (60.0%)        |
|                                                                                                    |                                      |                                                                                                                                                                                         |                      |                                       |  |                |   |                 | Retired (29.8%)        |
|                                                                                                    |                                      |                                                                                                                                                                                         |                      |                                       |  | Female (46.3%) | - |                 | Unable to work (37.5%) |
|                                                                                                    |                                      |                                                                                                                                                                                         |                      |                                       |  | Male (30.0%)   |   |                 |                        |

a. Outcome of Kruskal-Wallis test & Post-hoc test comparison groups

b. Outcome of Mann-Whitney U test

**Appendix 21 Correlation coefficient between psychological values and time use patterns and TRE in/around home**

|                                                                                         | PPT                                                                                                                                   | PTP                                                              | MTO                                                                                                       |                                                                                                                          |                                                                                                                                                                           | STO                                                              |                                                                                      | TTE                                                                                             |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>TRE in/around home</b>                                                               | 2.2b. I enjoy any additional time required for reaching the destination, such as waiting time at the airport or waiting for transfer. | 2.1e. At the end of holiday, I felt time had gone by so quickly. | 2.2f. I want to see as many things and do as many activities and experiences as possible when on holiday. | 2.2h There are so many things I want to do during my holiday, so I often feel time is running out at the end of holiday. | 2.3a. At the beginning of holiday, I find it hard to schedule my holiday activities in a timely manner because there are so many things to do and see at the destination. | 2.3b. When on holiday, I have to follow time schedules or plans. | 2.3c. When on holiday, I have flexibility of changing schedules and plans as I want. | 2.4b. 'Low cost' airlines (e.g. easyJet) have enabled me to travel for holiday more frequently. |
| 3.6a. I would spend this extra time for shopping to get better prepared for my holiday. | .149**                                                                                                                                | .105*                                                            | .120*                                                                                                     | .231**                                                                                                                   | .226**                                                                                                                                                                    | .222**                                                           | -.239**                                                                              | -                                                                                               |
| 3.6b. I would spend this                                                                | -                                                                                                                                     | -                                                                | -.112*                                                                                                    | -                                                                                                                        | -                                                                                                                                                                         | -                                                                | -                                                                                    | .110*                                                                                           |

|                                                                                                   |   |   |   |   |        |   |   |   |
|---------------------------------------------------------------------------------------------------|---|---|---|---|--------|---|---|---|
| extra time at home to rest and/or for personal care (e.g. bath).                                  |   |   |   |   |        |   |   |   |
| 3.6c. I would spend this extra time at home to do house work (e.g. laundry, cleaning, gardening). | - | - | - | - | .141** | - | - | - |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## Appendix 22 TRE in/around home statements by cluster groups

| TRE statement             | Outcome of Kruskal-Wallis test & Post-hoc test comparison groups                                    | Result                                                                                                                                                          | Agreement (%)             |                       |                             |                 |
|---------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------|-----------------------------|-----------------|
|                           |                                                                                                     |                                                                                                                                                                 | Travel time lover (N=165) | Busy explorer (N=113) | Quality time seeker (N=126) | Overall (N=404) |
| Shopping                  | $\chi^2(2)=18.786$<br>$p<0.001$<br>Cluster 3 with 2 ( $p<0.001$ )<br>Cluster 1 with 2 ( $p=0.043$ ) | The 'Busy explorers' (Mean rank=236.01) agreed to this statement significantly more than the 'Quality time seekers' (172.72) and 'Travel time lovers' (202.29). | 26.0%                     | 42.4%                 | 16.7%                       | 27.8%           |
| Resting/<br>personal care | -                                                                                                   | Not significant                                                                                                                                                 | 52.2%                     | 46.0%                 | 57.1%                       | 52.0%           |
| Housework                 | -                                                                                                   |                                                                                                                                                                 | 38.8%                     | 41.6%                 | 34.9%                       | 38.3%           |

## **Appendix 23 List of publication**

### **Published journal paper:**

Kim, S., Filimonau, V. and Dickinson, J. E., 2020. The technology-evoked time use rebound effect and its impact on pro-environmental consumer behaviour in tourism. *Journal of Sustainable Tourism*, 28 (2), 164-184.

### **Published conference papers:**

Kim, S., 2019. The time use rebound effect and its impact on consumer behaviour in sustainable tourism development. In: *Travel and Tourism Research Association's 2019 European Chapter Conference*, 8-10 April, Bournemouth University, UK.

Kim, S., 2019. The time use rebound effect and its impact on tourist consumption in the context of sustainable tourism. In: *Building Excellence in Sustainable Tourism Education Network Think Tank XIX*, 30 June – 3 July, San Francisco State University, USA.