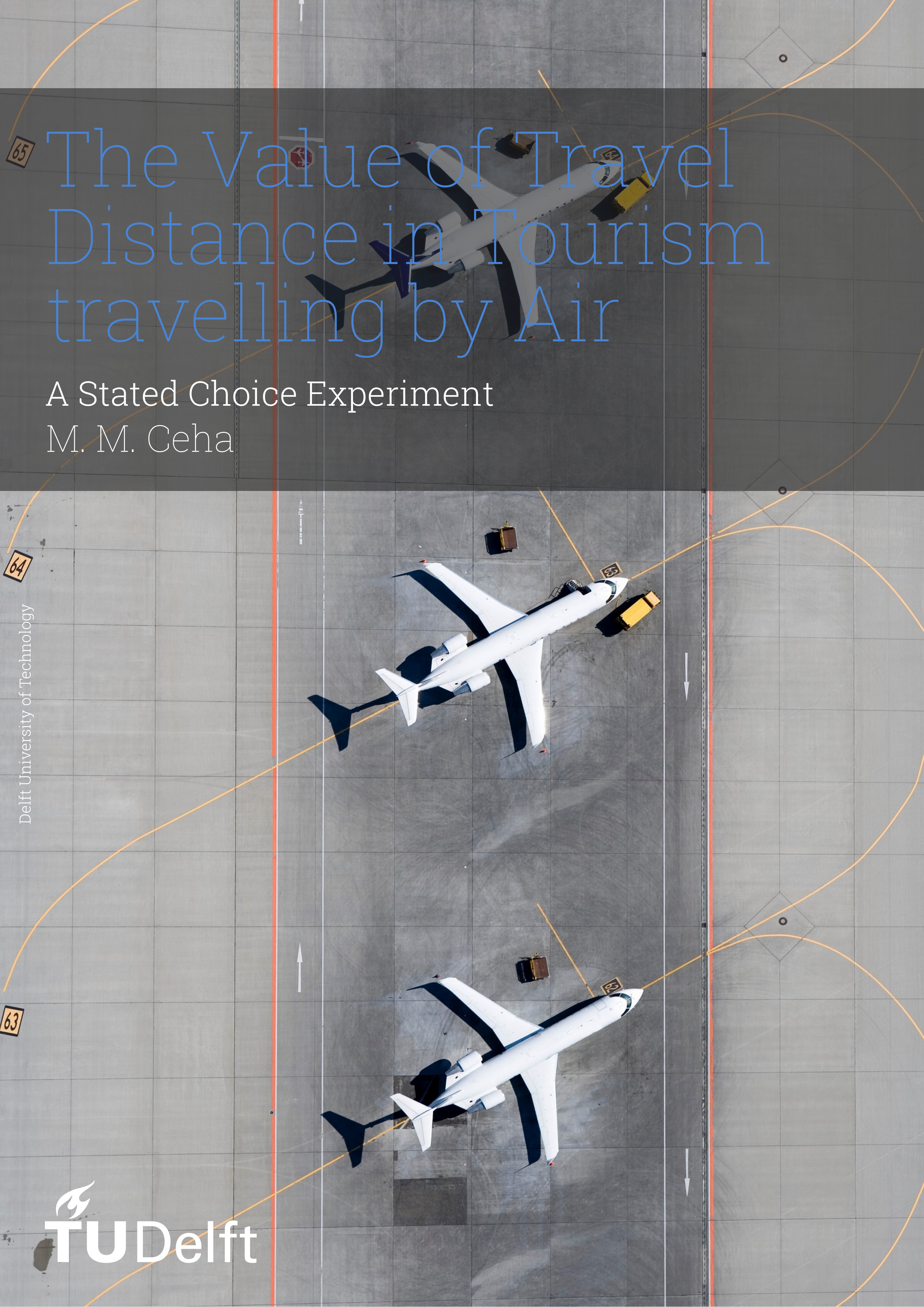

The Value of Travel Distance in Tourism travelling by Air

A Stated Choice Experiment

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by

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To obtain the degree of Master of Science
in Engineering Policy and Management
at the Delft University of Technology.

To be defended in public on February 22th

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Preface

This thesis is the final result of the graduation project of the MSc. Engineering and Policy Analysis at Delft University of Technology. It has been an interesting and enjoyable past six months during which I have learned a lot. Throughout this journey, I've been incredibly fortunate to receive amazing support from the people around me. I would like to express my gratitude to these incredible people whose guidance and encouragement have made this journey possible.

First, I would like to express my gratitude to Eric Molin, the chair of my committee, for guiding me through this process, for the detailed feedback, and for the time he dedicated to elevating my work to a higher standard. I would also like to thank him for his patience and for all the meetings we have had. Furthermore, I would also like to thank Gerdien de Vries for taking the time to read through my research and for providing feedback. This was highly valuable as it truly complemented the work.

I owe a lot of thanks to Toon Zijlstra for his invaluable assistance throughout this project. He was always willing to lend a helping hand whenever I had questions, taking the time to provide thorough guidance. I would also like to express my appreciation to Lizet Krabbenborg for her creative ideas, her time, and for her consistent positivity and support during our weekly meetings. I am also thankful to both of them for giving me the opportunity to conduct this research at the Kennisinstituut voor Mobiliteitsbeleid.

I would also like to express my heartfelt gratitude to my family, partner, and friends for their constant support and genuine interest in my research. Additionally, I want to thank them for the wonderful moments we shared outside of my research endeavours.

As my time at Delft University of Technology comes to an end, I am deeply thankful for the invaluable things I have learned and the wonderful memories created during my time here. I wish you a lot of enjoyment in reading my thesis.

M. M. Ceha
Delft, February 2024

Summary

Tourists travelling by airplane contribute significantly to the CO2 emissions. The number of flights covering longer distances is rising and, consequently, implies more energy consumption. This leads to a greater environmental impact compared to flights covering shorter distances. Although people are expected to continue travelling, adjusting the holiday destinations and modes of transport can effectively reduce the environmental footprint of tourism, all while maintaining pleasurable travel experiences. To minimize CO2 emissions by adjusting holiday destinations, destinations closer to home should be chosen. A trade-off seems to appear when selecting a holiday destination, involving a balance between the attractiveness of a specific destination and the different travel-related considerations. More attractive destinations can be reached with increasing distances, yet this also increases travel time and cost which are both preferred to be minimized. So far, research into the value of distance in this trade-off in the context of holiday destination choices is found to be limited. Therefore, this research studies how people value distance, controlling for travel time and travel cost, when choosing the destination for their holiday to gain a more comprehensive understanding of tourism travel behaviour. Since long-distance flights have larger CO2 emissions compared to flying over shorter distances, this study compares distances for holiday destinations that require long-distance flights with flights covering shorter distances. Additionally, these results can lead to interesting insights for policymakers. The main research question examined in this study is:

‘What is the value of physical distance for Dutch tourists in the choice of their summer holiday destination?’

For this study, a stated preference survey was created to collect data for addressing the research question, resulting in a sample of 254 Dutch tourists. To understand if distance holds intrinsic value, once controlling for travel time and for travel cost, and to investigate if the value of distance would change when travel time and cost are considered, two versions of a stated choice experiment are included in the survey. Version 1: *Choice experiment presenting all attributes* varied in the attributes: distance with a distance range of 2000 to 9000 kilometres, attractiveness of the destination varied in levels 6, 7, and 8 of a 10-point rating scale, travel time, travel cost and total holiday cost (excluding travel cost). While in version 2: *Choice experiment not presenting travel time and cost*, the travel time is excluded from the choice task and the travel cost is added up to the total holiday costs, resulting in varying in the attributes of distance, attractiveness of the destination, and total holiday cost. The respondents are randomly assigned to one of the choice experiments, resulting in half of the respondents completing one version while the other half completing the other.

Since people prefer different types of holidays, including all attractiveness attributes in choice sets may lead to many immediate ’no-go’ options. Therefore, the survey started with an additional experiment for all respondents. In this experiment, the respondents rated the attractiveness of different holiday destinations on a 10-point rating scale. This rating experiment included the attributes: holiday type, varying an active, relaxing, and sightseeing holiday; weather expectations, varying sun with clouds, sun with rain, and just sun; temperature, varying between 18-24, 24-30, and 30-36 degrees Celsius; familiarity with the destination, varying between ’familiar with destination, have visited’, ’unfamiliar with destination, also no friends have visited’, and ’unfamiliar with destination, recommended by friends’; and cultural differences, varying between almost no, some, and a lot of cultural differences. A regression model was estimated based on the observed ratings. This gives an indication of the attractiveness of holiday destinations. Based on the results of this regression model, it is shown that overall, destinations where sun or sun with clouds contribute most to the attractiveness of a holiday destination. This contribution is followed by destinations with large cultural differences. Then, holidays with temperatures between 24-30 degrees Celsius and active or sightseeing holidays are considered to contribute to the attractiveness of a holiday destination. It is found that familiarity only has a small contribution to the attractiveness where destinations that have not been visited before are preferred.

To investigate the intrinsic value of distance and if the value of distance changes considering travel time and cost, the results of the two versions of the choice experiments are estimated with a Multinomial Logit model. When comparing the results of both versions it was found that in version *Choice experiment presenting all attributes* a very small positive value exists, so small that it can be negligible. This suggests that once controlling for travel time and costs, there is no intrinsic value in distance. This was unexpected as it was expected that further distances would have a positive influence on the utility. The results of version *Choice experiment not presenting travel time and cost* show a small negative effect for distance. Since travel time was excluded from this choice set and travel cost was not separately presented, the distance was captured in travel time and travel cost, as was expected based on the literature. In both experiments, attractiveness was found to be an important attribute influencing the choice of a holiday destination, where more attractive holidays are desired. Total holiday costs are also important and should be reduced. This suggests that if attractive holiday destinations can be found in multiple places, distance is not an influential factor in choosing the holiday destination. Considering that destinations further away increase travel time and cost, choosing the attractive holiday destination most nearby, with a reduced total holiday costs, could increase the overall utility.

A possible explanation for the unexpected negligible value of distance when controlling for travel time and cost is the high importance of attractiveness and the distance range included in this study. It was found in the literature that choosing holiday destinations closer to home would not diminish the holiday experience, as long as the destination fulfils the desired holiday expectations. The results of the rating experiment showed that overall active or sightseeing holidays, where sun or sun with clouds is expected, with temperatures between 24-30 degrees Celsius with large cultural differences are mostly preferred. Except for destinations with large cultural differences, these types of holidays can be found within a distance range of 2000 kilometres. So, a distance of 2000 kilometres may already be sufficiently distant enough to reach attractive holiday destinations. Therefore, it is possible that further distances do not contribute to an increase in utility, resulting in a negligible small positive value of distance in this study.

To examine if there is heterogeneity among tourists in choosing holiday destinations, a Latent Class Choice Model is employed. For this purpose, the data of both versions of the choice experiments was stacked by excluding the travel time from the version *Choice experiment presenting all attributes* and by adding the travel costs to the total holiday costs. The Latent Class Choice Model obtained three classes: *Most price-sensitive travellers*, *Quality travellers* and *Distance travellers*, which have class weights of 35.8%, 45.8% and 18.5% subsequently. It is shown that for *Most price-sensitive travellers* and *Quality travellers*, the effect of distance is negative, while this effect is positive for *Distance travellers*.

The value of distance is negative for the majority of the respondents. However the number of long-distance flights is increasing for holiday travel. The observed negative value of distance opens the opportunity to explore possibilities for increasing the number of holidays closer to home, thereby reducing CO2 emissions. The people belonging to the classes *Most price-sensitive travellers* and *Quality travellers* should be encouraged to book holiday destinations closer to home, as they show a negative value for distance. This can be achieved by promoting the holidays they find attractive, which are active or sightseeing holidays where sun is expected with temperatures between 24-30 degrees Celsius and with a lot of cultural differences. For *Most price-sensitive travellers*, it is important that the total holiday costs are relatively low as they are most price-sensitive. While *Quality travellers* strongly prefer a high attractiveness and are willing to pay more to achieve this. It is more challenging to encourage the *Distance travellers* to book holidays closer to home, as they retrieve utility from destinations further away and are even willing to compromise on the attractiveness of the holiday destination. Therefore, by focusing on the *Most price-sensitive travellers* and *Quality travellers*, the most gains for reducing the number of long-distance flights for tourism can be achieved.

It should be noted that a limitation of stated preference studies is that people make choices in hypothetical scenarios which might be different in real-life situations. The findings from this study show a contradiction where the majority of individuals show a negative effect for longer distances, yet the average number of kilometres per flight is rising for tourists. This can be explained by the finding that the strong positive effect on the attractiveness of a holiday destination might outweigh the negative effect for distance. Another explanation is that people may have a desire for variety-seeking behaviour. Perhaps they have already explored numerous nearby destinations and are now seeking new experiences by travelling longer distances. If this is the reason to choose further holiday destinations, it would be difficult to encourage these people to keep on choosing holiday destinations closer to home. These insights lead to interesting opportunities for future research to find strategies that can encourage individuals to choose destinations closer to home. Other interesting future research possibilities are to investigate how different attitudes of people influence the value of distance and holiday destination choices, such as environmental considerations, or status. Understanding how to influence these choices could lead to a shift in travel behaviour, ultimately reducing the overall number of kilometres flown.

Contents

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Nomenclature

Abbreviations

Abbreviation	Definition
CO2	Carbon dioxide
SCE	Stated Choice Experiment
SP	Stated Preference
RP	Revealed Preference
LCCM	Latent Class Choice Model
BIC	Bayesian Information Criterion
KiM	Kennisinstituut voor Mobiliteitsbeleid
IQR	Inter Quartile Range
AoD	Attractiveness of Distance
VoT	Value of Time
VoA	Value of Attractiveness

1. Introduction

The world is facing a huge challenge today: mitigating climate change. Past decades have indicated that climate change is the result of intensified human activities that have led to increased emissions of carbon dioxide (CO2) and other greenhouse gasses (GHG) (Malhi et al., 2021; Mikhaylov et al., 2020; Thomas et al., 2019). The transport sector plays an important role in contributing to climate change (Andrés & Padilla, 2018). It is responsible for about 28,5% of total EU CO2 emissions (Europees Parlement, 2023). About 4% of these emissions come from air travel (Europees Parlement, 2023; D. Lee et al., 2021). On average, a flight trip adds 1 to 4 times as much to the CO2 emissions as the same trip taken by car (Milieu Centraal, 2023). In addition, travelling by plane can have an environmental impact 8 to 12 times greater than taking the same journey by train (Milieu Centraal, 2023).

The two main factors impacting the CO2 emissions are the destination choice, which relates to the travel distance, and the choice of transportation mode (Peeters et al., 2006; Gössling et al., 2005; Aamaas et al., 2013). Long-haul air travel, defined in this paper as flights crossing more than 4000 kilometres is concerning regarding climate change as the number of long-haul flights was increasing before COVID-19 (Christensen, 2016). These long-haul trips pose an environmental challenge as they imply more energy consumption, and therefore higher emissions of pollutants (Limtanakool et al., 2006). For example, in Germany in 2013, long-distance trips represent only about 2% of all annual trips but are responsible for over 60% of the climate impact caused by passenger travel (Aamaas et al., 2013). The growth of the air transport sector created an increased environmental awareness regarding CO2 emissions caused by air travel. The increasing concerns about CO2 emissions in the aviation sector have given rise to the concept of 'flight shame', initially originating from Sweden (AFAR, 2019). This concept encourages a shift in attitude to substitute air travel with more sustainable alternatives for example rail travel or reducing long-distance travel. Over two-thirds of the Dutch population, encompassing both flyers and non-flyers, have heightened their awareness of other alternatives for transport due to the pandemic (Zijlstra & Uitbeijerse, 2022). Nevertheless, a shift in mindset does not automatically result in a change in behaviour. Despite the growing awareness of climate issues, there is limited evidence to suggest a recent decline in people's tendency to travel (Zijlstra & Uitbeijerse, 2022). Even though COVID-19 had a great impact on the air transport sector, resulting in a huge drop in demand for air travel (Financial Times, 2020). At the end of 2023, the aviation industry has globally recovered to pre-COVID levels (OAG, 2024), and is again expected to increase in the next years (IATA, 2022).

1.1. Problem statement

Tourism transport, particularly air travel, accounts for the majority of CO2 emissions in the tourism sector (Lenzen et al., 2018; Gössling and Peeters, 2015). Travelling over long distances has a greater environmental impact compared to shorter distances (van Goeverden et al., 2016). Kamb et al., 2021, suggest that people will continue to travel, but altering their destinations and transportation modes can mitigate the climate effects of tourism transport while still enjoying travelling. To reduce CO2 emissions shorter distances should be considered (Milieu Centraal, 2023), such as opting for Spain instead of Cuba, or selecting trains over air travel. Leisure travel is often characterized by the flexibility to select various destinations that offer similar options for relaxation and enjoyment. In contrast, visiting family and friends or travelling for business purposes tend to be less flexible since it is often bound to a specific destination. Therefore, this study will focus on tourism air transport, specifically travel for holiday reasons.

Tourists often face trade-offs when planning their trips, balancing factors like distance, costs, time constraints, and the attractiveness of a destination. Choosing a more distant and exotic location may increase travel time and expenses but can offer unique and attractive experiences, while opting for a closer and cheaper destination may save time and money but potentially compromise on the novelty and attractiveness of the journey (Harrison-Hill, 2000). On the other hand, holiday destinations closer to the tourists' homes do not necessarily diminish the quality of the vacation, as long as the chosen destination aligns with the expectations and desired holiday experience (Scott et al., 2010). It suggests that travellers do not always have to go to distant or exotic places to have a fulfilling vacation; nearby destinations can also offer enjoyable experiences. To sum up, there are different perspectives on the trade-offs people make when selecting a holiday destination. This is further elaborated in the literature review in Chapter 3.

1.2. Research gap and research goal

Travelling to a destination involves physical, time-related, and financial expenses. It is found in the literature on travel behaviour that people want to reduce travel time and cost (Cao et al., 2020; Wu et al., 2011). Peeters et al. (2007) observed that since flying has become more popular for leisure travel, the average distances travelled by tourists are rising, which might seem counter-intuitive since travel time and travel costs are typically viewed negatively in the literature regarding travel behaviour. However, visiting more distant places can be the result of lower airfares and an increased availability of direct flights (Peeters et al., 2007). Destinations further away potentially offer the possibility of choosing an indirect flight which could be cheaper, and therefore reducing the travel costs but increasing the travel time; or offer the possibility for choosing a more expensive direct flight, and therefore reducing the travel time but increasing the travel cost. Overall, the trip to a destination further away is often more expensive and has higher travel times than destinations nearby. For this reason, distance can be seen as a discouraging factor in the destination choice (Larsen and Guiver, 2013; Taylor and Knudson, 1973). Moreover, numerous tourists are often more interested in seeking a holiday experience that can be found in multiple destinations, rather than at a specific place for their vacation (Scott et al., 2010; Larsen and Guiver, 2013). Other papers suggest that there is a positive utility gain regarding distance, since covering larger distances could contribute to different and enhanced holiday experiences (Jeuring and Peters, 2013; Dinnie, 2007), or when the journey itself contributes to the holiday experience (Larsen and Guiver, 2013; Malichová et al., 2022). The relative perception of distance also differs among individuals and thereby influences the destination choice, such as accessibility (Verma et al., 2019), familiarity (Dinnie, 2007), or cultural distance (Bi & Gu, 2019). Suggesting that some holiday destinations might feel closer to home or further away than they actually are. It is also interesting to note that people overall have different preferences. Different socio-demographic characteristics may impact tourists' travel motivations and preferences when making choices (Yoo et al., 2018). For example, Nicolau (2008) discovered that people with a higher income have a positive response towards distance, in contrast to those with lower income levels. Moreover, people travelling with younger children prefer more nearby destinations.

The previously mentioned literature indicates that distance can be valued both negatively and positively, and this valuation may also depend on the preferences of individuals. Cao et al. (2020) explains that there is a positive relationship between the desire for distance and the intention for tourism travelling. Yet, this entails increased travel time and costs, which people often seek to minimize. The trade-off, previously mentioned in the problem statement, appears to exist, involving a balance between the attractiveness of a specific holiday destination and the different travel-related considerations. The travel time and cost to travel to a destination is based on the distance to this destination. Therefore, travel time and cost are intertwined with distance. This raises the question if distance has an intrinsic value once controlling for travel time and cost. And how is distance traded off against travel time, cost, and the attractiveness of the destination on the choice of a holiday destination. So far, much research has been done on tourism travel behaviour and destination choices. Yet, limited research has been conducted on whether there is an explicit value in distance itself when it comes to choosing a holiday destination, apart from other travel-related considerations such as travel time and cost. Since long-distance flights have larger CO_2 emissions compared to flying over shorter distances, this study compares holiday destinations that require long-distance flights with flights covering shorter distances. Therefore, this study aims to explore what the value of distance in itself is in the choice of a holiday destination and thereby gain more insight into the possibilities of discouraging long-distance flights for holidays.

So, the overall objective of this study is to gain more knowledge on the value of distance in destination choices for holidays including long-distance flights. This contributes to a deeper understanding of tourism behaviour, which could be considered when formulating new policies for the tourism and travel industry. Paragraph 1.3 will delve further into this social relevance.

1.3. Scientific and social relevance

Reducing the amount of flown kilometres to reduce CO2 emissions is a very complex problem. To mitigate this, effective policy measures need to be implemented. This involves actors having high interests in the future growth of the aviation industry, such as airline operators and tour operators as they want to enhance their revenues and profits (NOS, 2023). As well as actors having high interests in the reduction of the aviation industry due to climate change and other environmental issues including noise pollution, such as environmental organizations and residents living near airports (Greenpeace, 2022; RTL Nieuws, 2024). Then there also is the government, which faces the dual challenge of meeting climate goals while simultaneously maintaining a robust economy. The government has the responsibility for making policy measures to deal with the problem. The Ministry of Infrastructure and Water Management provides directions for air transport policies on behalf of the Dutch government and establishes the legal frameworks for them (Ministerie van Infrastructuur en Waterstaat, 2023). Policy measures that can be implemented to reduce the number of flights and consequently decrease the CO2 emissions caused by air travel are for example: increasing the tax on air tickets, or implementing a CO2 emissions cap. Other possible measurements that are more consumer-specific could involve higher taxes on flights covering longer distances, or implementing increased taxation for individuals with frequent air travel patterns. However, to create effective policy measures, it is important to have a comprehensive understanding of tourism travel behaviour.

This study addresses a research gap in the existing literature focusing on the explicit value of distance in the choice of a holiday destination including destinations requiring long-distance flights. Scientifically, the exploration of this explicit value of distance independent of travel time and cost adds depth to the understanding of tourism travel behaviour. By investigating the potential value of distance in the choice of a holiday destination, the research aims to gain information into the complex dynamics that influence individuals' preferences in the realm of tourism travel behaviour.

The societal relevance of this study lies in its potential implications for policymakers such as the Ministry of Infrastructure and Water Management. The trade-off when selecting a holiday destination involves a balance between the attractiveness of a holiday destination and the different travel-related factors including distance, are investigated. The value for distance is studied controlling for travel time and cost. This provides insights to gain knowledge on how people explicitly value distance for selecting holiday destinations. Understanding the individuals' value of distance and their holiday destination preferences can inform the development of sustainable policies. In this way, input can be provided for effective policy measures to mitigate CO2 emissions caused by tourism travel behaviour.

1.4. Scope

Studying the value of distance in the tourism sector entails many different factors. The scope is defined to outline the boundaries of the study. First of all, since the information will be provided to the Dutch government, this research is focused on Dutch tourists. Furthermore, given that long distances can be viewed through both physical metrics (measured in kilometres) and relative dimensions, distance can be defined in multiple ways. Relative dimensions can for example be zonal (tropical climate, mountains, sun and sea) or ordinal (nearby, far away). These relative dimensions can be interpreted differently, while a physical distance is a measurable value. Therefore, it is chosen to use physical distances in this study. Additionally, this research only investigates travelling by plane and thereby excludes researching tourism travel behaviour by other transport modes (car or train). Also, since this study is focused on air travel and compares holiday destinations requiring long-distance flights with destinations requiring shorter flights, this study only includes destinations that at least require flights covering 2000 kilometres. This ensures that destinations closer to home, which can more easily be accessed by car or public transport, are not included in this analysis. Lastly, this research is focused on summer holidays only, while other holidays might involve different travel behaviour.

1.5. Research questions and approach

This study aims to research the value of distance when selecting a holiday destination. The main research question that is examined in this study is as follows:

What is the value of physical distance for Dutch tourists in the choice of their summer holiday destination?

To address the main research question, the following three sub-questions have been formulated:

1. *How is the distance to a holiday destination traded off against the travel-related characteristics of the trip and the attractiveness of a destination regarding the choice of a holiday destination?*

Given that travel time and cost are related to the distance to a destination, it can be inferred that these factors are intertwined and influence each other. By expanding the range of distances for a holiday destination, more desired holiday destinations can be reached. This however increases the travel time and cost, which have a negative effect on the utility. The second sub-question is asked to investigate if distance has an intrinsic effect on the choice of a holiday destination when controlling for travel time and cost. This sub-question is formulated as follows:

2. *Does the influence of distance on the choice of a holiday destination change when travel time and cost are considered?*

Different people have different preferences regarding travel motivations and preferences when making choices for a holiday destination. The third sub-question is asked to study if the value of distance differs between people. If it appears that the value of distance is positive, negative, or not even important for certain individuals, it is interesting to identify the characteristics of these individuals and the type of holidays they prefer. This information can be utilized to encourage them to choose holiday destinations closer to home, or discourage them to opt for destinations far away. This sub-question is formulated as follows:

3. *To what extent do preferences and choices of a holiday destination differ between people?*

To examine the research questions, a survey is constructed including a stated preference (SP) choice experiment. By means of this survey, the travel behaviour of Dutch tourists is studied. To understand how travellers consider distance when selecting a holiday destination, considering the characteristics of both the trip and the destination, it is necessary to conduct a choice experiment. This experiment should systematically vary the features of both the attractiveness of a holiday destination and the trip to the destination. The results of this choice experiment are used to answer the first sub-question. There is however a lot of heterogeneity in preferences when it comes to the attractiveness of a holiday destination. If all attributes regarding the attractiveness of a holiday are included in the choice sets, it would incorporate many alternatives that would not be chosen anyway and therefore result in an immediate 'no go'. So, when the attractiveness is included in the trade-off against the other factors travel distance, time and cost, an additional experiment experiment should be incorporated to explain the attractiveness of a holiday destination. Therefore, the experiment is split up into two different experiments: the rating experiment and the choice experiment. This experimental setup is further explained in the methodology chapter 2.

Since distance is often associated with travel time and cost, it is expected that the value of distance is different when controlling for travel time and cost. So to identify if distance has an intrinsic effect on the choice of a holiday destination when travel time and cost are considered, two versions of the choice experiments are included in this study. One version separately presents the travel time and costs as well as distance, while in the other version travel time is excluded from the choice experiment, and travel cost is added to the total holiday cost. In this way, the second sub-question is addressed by comparing the two experiments, and to see if the value of distance changes.

The third sub-question of this research can be answered by understanding how the preferences and choices of a holiday destination, including both the attractiveness of a destination and the trip to the destination, differ between people. If it appears that distance is valued differently by different people, it should be understood who these people are and what kind of holidays they prefer. It is interesting to uncover different segments or classes within the sample population, each characterised by specific preferences. This is analysed using a Latent Class Choice Model (LCCM), a choice model that allows to uncover these different classes and enables to study heterogeneity. To understand the kind of holidays the people within each class prefer, the outcomes of the LCCM are used again in the linear regression model to analyse the heterogeneity within the preferences for attractive holiday destinations.

1.6. Report structure

The structure of this report is as follows. The second chapter (2), gives an explanation about the method that is applied for this research. The third chapter (3), elaborates on the literature which has already been studied on tourism travel behaviour and the perception of distance. The next chapter (4), explains the attribute selection and the construction of the survey design in detail. The descriptive statistics of the results found are given in the following chapter (5). The results are subsequently presented in the results chapter (6). In the last chapter (7), the conclusions, implications, limitations and future research suggestions are given.

2. Methodology

This chapter provides an overview of the research methodology of this study. The research has been set up in two different experiments. Firstly, it introduces Discrete Choice Modelling (2.1). Next, it explains the Stated Choice Experiments (2.2). Then the methods used to design the Stated Choice Experiments are elaborated on (2.3). Subsequently, the data collection method is discussed (2.4). At last, models to analyse the Stated Choice Experiments are discussed (2.5).

2.1. Discrete Choice Modelling

Discrete Choice Modelling is a statistical modelling technique used to provide a better understanding or predict decision-making between two or more alternatives (Bierlaire, 1998). In other words, it offers insights into trade-offs people make and into the different factors influencing their choices. These factors can be both observable or unobservable to the researcher. The theoretical foundation that is assumed for developing the discrete choice model is the Utility-Maximization Theory (Bentham, 1970). Meaning that the alternative with the greatest utility benefit is chosen by the decision-maker. Discrete Choice Modelling enables the estimation of weights decision-makers assign to the attributes of the alternatives when making choices (Chorus, 2012).

As previously mentioned, decisions are not only determined by attributes, also socio-demographic characteristics play an important role in decision-making. Implying that individuals may assign varying values to specific attributes. The socio-demographic characteristics contributing to the difference in preferences can be explored through segmentation. Latent Class Choice Modelling (LCCM) is a commonly employed model for segmenting choice-based data. LCCM's can be useful when there is heterogeneity or diversity in the preferences of individuals within a population, allowing to identify different segments or classes of individuals with similar preferences. Thus, LCCM can be used to capture heterogeneity in preferences, leading to more nuanced insights for identifying if different segments or classes react differently to several attributes.

2.2. Stated Choice Experiments

Stated Choice Experiments (SCE) are experiments containing choice sets that include two or more hypothetical alternatives, defined by multiple attributes with varying levels. Attributes refer to the characteristics that describe the alternative within a given choice set (e.g. alternative A: price: high, travel time: low, level of comfort: medium). The attribute levels differ among the alternatives available to the decision-maker. The efficient variation of attribute levels is important to extract substantial information from the choice experiment without overwhelming respondents with an excessive number of choice tasks. The SCE is therefore constructed using an Experimental Design to vary the choice sets.

There are two approaches used for data collection in SCE's: stated preference and revealed preference (RP). SP data involves the preferences of individuals in a hypothetical choice situation and is specifically useful when someone is interested in hypothetical scenarios or when there is no data on real market situations (Telhado Pereira et al., 2007). Furthermore, when using SP, multiple choices from a single respondent can be observed, thereby fewer respondents are required. In contrast, RP observes individuals' choices made in the past in real-world situations which generally reveals more valid results since hypothetical bias is avoided. However, in this research, it is studied if distance in itself has an intrinsic value on the choice for a holiday destination when controlling for travel time and costs. This is analysed using two different choice experiments. To compare these, SP is utilised in this study to identify the effects independently from each other and to better understand the trade-offs individuals make when choosing a holiday destination.

2.3. Designing the SCE

This section explains in a couple of steps how the SCE's are designed. It starts with explaining what the setup structure of the experiments looks like (2.3.1). Then the method for attribute and attribute level selection is elaborated on (2.3.2). At last, the construction of the experimental designs is discussed (2.3.3).

2.3.1. Setup structure of the experiments

As explained in the introduction Chapter 1.5, there is a lot of heterogeneity in preferences when it comes to the attractiveness of a destination. There is a risk that some alternatives in the choice sets would not be chosen anyway when all alternatives regarding the attractiveness of a holiday destination are included in the choice sets. What people find attractive about a holiday destination is a personal interpretation and is therefore estimated as a complex variable in a rating experiment. The rating experiment is constructed to estimate how the attributes influence the rating of the complex variable 'destination attractiveness'. This allows to identify how people rate the attractiveness of a holiday destination to understand the relations between the observable underlying attributes and the rating score, representing how attractive the holiday destination is. The rating experiment is followed by a choice experiment to analyse the trade-off between the 'destination attractiveness' score, and the other trip-related attributes: travel distance, travel time, travel cost and total holiday cost. The experimental setup of these two experiments is shown in Figure 2.1.

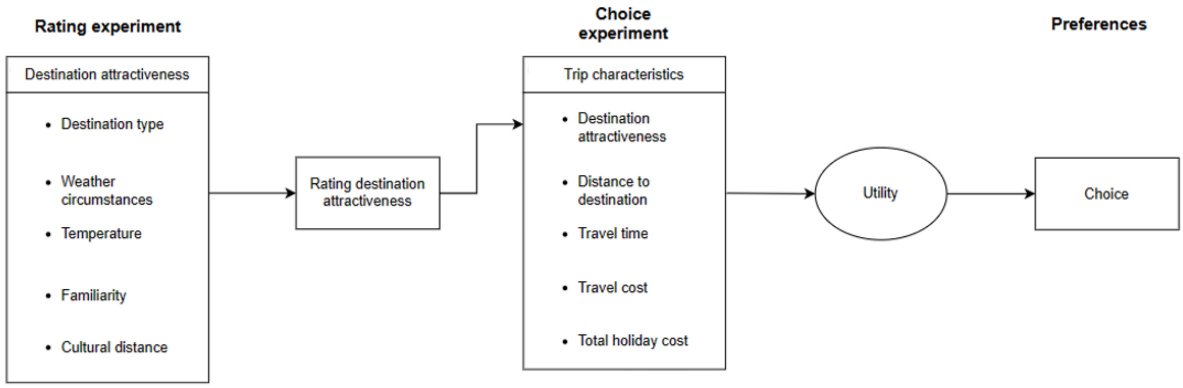

Figure 2.1: Experimental setup structure

In the introduction chapter in section 1.5, it is explained that a second version of the choice experiment is constructed to analyse if there is an intrinsic value in distance for the choice of a holiday destination when controlling for travel time and cost. In version 1 the attributes 'destination attractiveness', 'distance to destination', 'travel time', 'travel cost', and 'total holiday cost (excluding travel cost)' are presented. This version is called: *Choice experiment presenting all attributes*. Version 2 only presents the 'destination attractiveness', 'distance to destination', and 'total holiday cost (including travel cost)'. Here the 'travel time' is excluded from the choice set and the 'travel cost' is added to the 'total holiday cost'. This version is called: *Choice experiment not presenting travel time and cost*. These two versions of the choice experiment led to two versions of the survey. Both versions contain the rating experiment, followed by one of the two versions of the choice experiment. Respondents are randomly assigned to one of the two versions. This approach allows to analyse whether the weight of distance changes when travel cost and time are presented or not. This results in the adjusted experimental setup structure, shown in Figure 2.2.

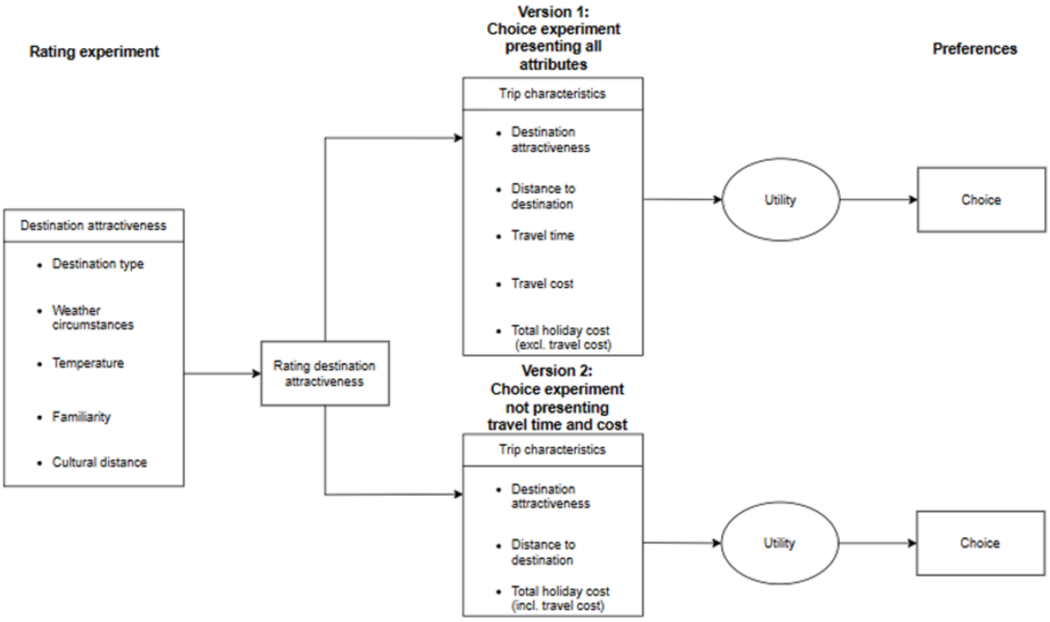

Figure 2.2: Experimental setup structure

2.3.2. Attributes and attribute levels

Attributes are the aspects of the alternatives and can include factors such as travel distance, time and price that influence decision-making. The attribute levels describe the possibilities for their attribute (e.g. attribute: travel time, level: 10 hours, 13 hours, 16 hours). The attributes and attribute levels are developed in a multi-staged process. This research is done by (1) conducting a literature review to identify the potential attributes; (2) executing small interviews; (3) selecting attributes and levels; (4) validating SCE.

1. *Literature review*

   First, a systematic literature review on different perspectives of distance is executed to gain a better understanding of how individuals interpret distance. Then, a systematic literature review is conducted to identify potential attributes. To find potential attributes, the focus of the literature review is on papers researching tourists' travel behaviour of destination choice.

2. *Interviews*

   Small interviews have been conducted to indicate different factors people think of when choosing a destination. This is of added value since it provides more information and inspiration about people's decision-making process and as well as it allows assessing of whether the literature is a good fit for the decision-making process. Interviews have been conducted over a period of two weeks, simultaneously with the review of the existing literature. The sample interviewed comprised Dutch tourists who met the same criteria as the survey respondents, namely having undertaken a flight for holiday reasons within the past 5 years. To capture a range of viewpoints and experiences, people with different gender and ages have been interviewed. The saturation point, indicating the point where no new information are introduced was reached quite early. After interviewing 4 people, no new factors influencing the choice behaviour were introduced. However, since the interviews costs only a couple of minutes, it has been decided to conduct the small interviews on more people to increase the diversity of people included in the interviews. In the end, a total, 20 Dutch tourists who have travelled by plane for their holiday within the past 5 years have been interviewed. This group comprised 8 men and 12 women, with ages ranging from 24 to 63 years. The interviewees have been recruited within the authors' network. Some travelled with children, some travelled alone or with a friend or partner. These interviews contain only three questions and were asked in person:

(a) *What was your most recent vacation destination by plane*
(b) *For what reasons did you choose this destination?*
(c) *What did you think of the distance?*

The first question has been asked to find out where this person flew to and what the distance to this destination is. The second question has been asked to find out the motivations someone has for choosing a specific destination. The third question has been asked as an open question to gain an understanding of someone's perspective of distance. The literature review and interviews are conducted simultaneously.

The results from the interviews show that many attributes found in the literature are aligned with interview outcomes. However, some attributes are interpreted differently than indicated in the literature, these findings are incorporated in determining whether to include them in the experiments.

For more details of the interview outcomes, see Appendix B. Section 3.4 describes the most interesting outcomes of the interviews used for the selection of the attributes.

3. *Selection of attributes and attribute levels*

   Stated preference methods face a challenge when dealing with many attributes, as an excessive number of attributes can lead to respondent burden and information overload (Molin & Timmermans, 2009). The most important attributes for respondents and the attributes that could retrieve relevant information for policy design are chosen (Molin, 2022). Furthermore, it was taken into account that the attributes did not overlap, are measurable and interpreted in a single way. The number of attribute levels is limited to two to four levels (Molin, 2022). Based on these criteria and based on the literature review and interview outcomes, the list of the selected attributes and attribute levels is made for the SCE. Feedback for this selection of attributes and attribute levels is gathered from an expert in the field of Discrete Choice Modelling, an expert in the field of psychology and two experts in the field of mobility of transport. Taking this feedback into account, the final selection of attributes and attribute levels is made.

4. *Testing SCE*

   To confirm the time required for respondents to complete the survey, to assess the clarity of the questions, and to identify if any of the attributes exerted a notably dominant influence, the SCE is tested. This is done after the experimental design is constructed and includes the entire survey, incorporating questions related to socio-demographic characteristics. This test survey is spread to only a limited number of respondents due to time constraints.

2.3.3. Experimental design construction

After the attributes and the attribute levels are identified, the experimental design is created. The experimental design involves creating specific combinations of attributes and their corresponding attribute levels into sets of alternatives, which participants assess in choice questions (Johnson et al., 2013). To create the experimental design, some choices need to be made.

To make a distinction between the two alternatives given in the choice set, it is to be decided to use labelled or unlabelled alternatives to present this distinction. Labelled alternatives provide information to respondents (e.g. 'Alternative Cuba') and allow to present different attributes per labelled alternative to the respondent. Unlabelled alternatives (e.g. 'Alternative A') encourage respondents to make choices by considering the trade-offs between the same attributes (De Bekker-Grob et al., 2010). In this choice experiment, all attributes and attribute levels presented in the alternatives of the choice set are similar. Also, the trade-off should be made between two alternative trips that do not represent a trip to a specific country since this could lead to bias. Therefore, the unlabelled alternatives are used in the choice experiment.

There are two possibilities to construct a choice set: simultaneous and sequential construction. Simultaneous construction means that the alternatives and choice sets are simultaneously constructed. It is applied for choice experiments with labelled alternatives. Sequential construction means that the alternatives are randomly placed into choice sets. This is applied for choice sets with unlabelled alternatives (Molin, 2022). Therefore, sequential construction is applied to construct the choice sets in this experimental design.

There are different design types to design the choice experiment. Depending on the number of attributes and attribute levels, a choice will be made for either an orthogonal fractional factorial design or an efficient design. The advantage of an orthogonal factorial design is that a smaller number of alternatives can be used, compared to a full factorial design. Orthogonal designs ensure that correlations between attributes are zero. This design type also ensures attribute level balance. An efficient design can be useful to avoid dominance. When dominance occurs in a choice set, no information is provided about trade-offs. This could increase the reliability of the parameters and could reduce the number of choice sets. An efficient design is based on prior information. Both designs can be constructed using the software Ngene, a tool for generating experimental designs. In this study, the efficient design is used to avoid dominance in the choice sets and to reduce the number of choice sets. This is further elaborated on in section 4.4.2.

2.4. Data collection

The constructed experimental designs, together with the socio-demographic questions, are implemented in a survey for the respondents. This survey also includes a filter question to ensure that the target group is properly identified. The target group is air travel passengers who have at least travelled once with an plane for holiday reasons within the last 5 years. 5 years might seem as a long time range, but it is also intended to encompass travellers' experiences before COVID-19. Respondents outside this target group are excluded from the data analysis.

The survey is spread to collect the data. This is done by spreading the survey via WhatsApp and by uploading it on the websites: surveycircle.com and surveyswap.io. These websites are platforms to exchange surveys to generate more respondents.

The obtained data is managed confidentially. Approval of TU Delft's Human Research Ethics Committee is asked before collecting data to ensure this.

2.5. Analysing SCE

This section introduces the estimation models for both the rating and choice experiments. First, the linear regression model is explained for the rating experiment (2.5.1). Secondly, the Multinomial Logit (MNL) model (2.5.2) and LCCM model (2.5.3) for the choice experiments are explained.

2.5.1. Linear regression model

The rating data is the data observed from the rating experiment. This data is analyzed using a linear regression model. The linear regression aims to estimate the regression coefficients (β) for the holiday-related attributes. The observed rating data is assumed to be of interval level and therefore a linear regression model can be applied to predict the ratings. However, since a rating scale from 1 to 10 is applied for the rating experiment, it is debatable if this can be assumed. The interpretation of the distance between individual rating levels may vary among different respondents. To enable the use of interval variables in the choice experiment, a decision was made to simplify the rating variable, treating it as a continuous scale. This ultimately makes linear regression possible. the mathematical equation for the linear regression is as follows:

$$Y = \beta_i + \sum \beta_j \cdot X_j + \epsilon_j \tag{2.1}$$

- Y is the dependent attribute
- β_i is the intercept
- β_j indicates the units change in the rating by one unit change in attribute X_j
- X_j is the independent attribute
- ϵ_j is the predicted error term, the part of Y the regression model is unable to explain (residual)

Linear regression identifies the line of best fit within your data by seeking the regression coefficient (β_i) that minimizes the overall error (ϵ_j) of the model.

The linear regression model is performed using the software RStudio. The syntax of the model can be found in appendix G.1.

2.5.2. MNL model

The choice data is the data observed from the choice experiments. This data is analyzed using an MNL model. The MNL model is based on the Random Utility Maximization (RUM) theory. The RUM theory assumes that people always choose the option that maximizes their utility. The total utility is the systematic utility plus the error term (Chorus, 2022). The equation of the MNL model is as follows:

$$U_{in} = \sum_{m} \beta_{im} \cdot X_{im} + \epsilon_i \tag{2.2}$$

- U_{in} is the utility of alternative i, of individual n
- β_{im} indicates the units change of alternative i for attribute m by one unit change in attribute X_{im}
- X_{im} is the independent attribute of alternative i for attribute m
- ϵ_j is the predicted error term, the part of utility the MNL model is unable to explain (residual)

The MNL model is performed using the software RStudio, applying Apollo. The syntax of the model can be found in appendix G.2.

2.5.3. LCCM

The MNL model assumes that all respondents are homogeneous in there preferences. To identify if the respondents are heterogeneous and if their are different classes within the sample population, LCCM was applied. LCCM's operate under the assumption that the sample population can be categorized into several classes based on characteristics. It identifies unobserved subgroups within the sample based on the observed variables. Each group shares similarities in their characteristics while differing from individuals in other groups. The value of distance is the most important attribute of interest in this research. Since distance is only included in the MNL model and not in the linear regression model it is decided to identify the classes based on the MNL model instead of the regression model. In this way, it can be observed if different classes value distance positively or negatively. LCCM's contain a class membership model and a class-specific model. The class membership model calculates, based on the respondents' characteristics, the probability that the respondent is part of a specific class. The class-specific model shows the behaviour, specific to a class, taking the attributes of the alternatives into account. This defines the preferences the respondents in each class have for the attributes.

The first step in the LCCM is to define the number of classes that fit the data best. This is done by estimating the LCCM for 2, 3, 4 or more classes, and than analysing which statistical criteria are found to be the best. The number of classes with the lowest Bayesian Information Criterion (BIC) is chosen. The next step is to estimate the estimated effects of the attributes of the model with the chosen amount of classes. This allows to assign titles to the classes based on the weights of the attribute. The final step is to analyse what the probabilities are of belonging to a specific class based on the different socio-demographic characteristics of the respondents.

The LCCM is performed using the software RStudio, applying Apollo. The syntax of the model can be found in Appendix G.3.

When the classes are identified, and it is clear which socio-demographic characteristics belong to which class, it is interesting to understand if there is heterogeneity in holiday preferences of the individuals within each specific class. This aims to gain a deeper understanding of the holiday preferences associated with each identified class. The decision is made to explore heterogeneity in the linear regression model across various classes since it is more interesting to know the preferences for attractiveness of a destination when it is known how the people react towards distance. To achieve this, a linear regression model is again performed, only incorporating the probabilities of the respondents belonging to each class, derived from the class membership function.

3. Literature review and interview outcomes

This chapter discusses the literature study conducted on the different perspectives tourists have on distance for holiday destinations, tourists' preferences for holiday destinations, and trip-related factors influencing tourism travel behaviour. Additionally, the outcomes of the interviews are discussed in this chapter. The Scopus database was used as a search engine for the literature. A systematic literature study is performed which can be found in Appendix A. To collect literature for the perspectives of the value of distance, the following search string is applied: Tourism AND (distance OR "travel distance") AND perception OR perspective. The papers were filtered to only English papers which resulted in 222 papers. After scanning the titles and abstracts, there were still 12 articles remaining. In the end, 7 articles were included in the literature review on the perspectives of the value of distance. To collect literature for the tourists' preferences for holiday destinations and trip-related factors influencing tourism travel behaviour the following search string is applied: ("travel behaviour" OR "tourism travel behaviour" OR tourists) AND "destination choice". The papers were filtered to only English papers which resulted in 700 papers. After scanning the titles and abstracts, there were still 58 articles remaining. In the end, 23 articles were included in the literature review on the destination attractiveness factors. The backward snowballing method is used to find more interesting literature.

Section 3.1 elaborates on the existing literature on the perspectives of the value of distance. Section 3.2 indicates the factors found in the literature influencing holiday destination choices. Section 3.3 explains the factors influencing decisions on the trip-related alternatives. Then, section 3.4, discusses the most interesting findings of the interviews. Section 3.5, explains the socio-demographic characteristics commonly used in tourism travel behaviour literature. At last, section 3.6 presents the conceptualization of the study.

3.1. Perspectives on the value of distance

This section gives insights into the literature on what is found in the different perspectives of the value of distance. Individuals have different perspectives on how distance affects their preferences, choices and travel behaviour (Larsen & Guiver, 2013). Understanding how people perceive distance is important in this study to help to determine how distance will be incorporated into the stated choice experiment. It appears that people have limited knowledge of physical distances (measured in kilometres) to different countries of continents (Larsen & Guiver, 2013). Many researches note that distance is most often not perceived in kilometres but in travel time and cost (Jeuring and Haartsen, 2018; Bi and Gu, 2019; Larsen and Guiver, 2013), or just travel time (Harrison-Hill, 2001). However, other relative dimensions regarding distance also play a role in how people perceive distance, including accessibility (Verma et al., 2019), familiarity (Dinnie, 2007) or culture at the destination (Bi & Gu, 2019).

Larsen and Guiver (2013) aimed to discover different perspectives through which tourists perceive distance by conducting interviews. To express relative distance, participants referred to scales including cost, travel time and cultural difference rather than actual physical distance, such as kilometres. For many tourists, their choice of holiday destination is influenced by their desire to minimize both travel time and costs. Tourists have limited knowledge of physical distances, particularly since air travel allows for covering long distances quickly (Larsen & Guiver, 2013). Another observation of this article is that tourists perceive distance in terms of either ordinal or zonal. Ordinal indicating nearby, far or further away and zonal indicating "away from home" or "sun and sea". Also, many tourists are not necessarily looking for a particular destination for their holiday; instead, they want a holiday experience that can be found at various destinations (Scott et al., 2010; Larsen and Guiver, 2013). Opting for destinations that are closer would not reduce the holiday experience, as long as the destination meets the expectations for the holiday. This implies possibilities of choosing destinations closer to home (Scott et al., 2010).

Another perspective mentioned in literature is cultural distance, which refers to the cultural differences between two cultures. It is observed that tourists choose destinations with similar cultural backgrounds, while other studies propose that tourists prefer visiting destinations with high cultural distances (Bi and Gu, 2019; Lee et al., 2018). These conflicting results make the effect on tourists' destination choice more complicated. Bi and Gu (2019) illustrate that cultural distance and the perception of novelty seeking are related. This is supported by Dinnie (2007) by noting that destinations close to home may appear too familiar and therefore lacking in association with a holiday experience. This leads to an assumption that high cultural differences are associated with destinations further away. Thus, not only destinations that are too far away are considered less appealing, but also destinations too close to home could be perceived undesirable. Furthermore, the article of Verma et al. (2019) illustrates that establishing a direct long-distance flight to a destination reduces the perceived distance to the destination because of the reduced travel time, compared to an indirect long-distance flight. Which results in a different perspective of distance driven by expanded accessibility.

Distance plays a valuable role in travellers' decision-making processes, both in terms of destination choice and the journey itself. Harrison-Hill (2000) explains that distance can have both a positive and negative utility. On one hand, it may be viewed as a limiting factor due to the physical, temporal, and monetary costs associated with travelling, potentially restricting destination choices. However, distance can also be seen as a positive utility, enhancing the overall holiday experience (Cao et al., 2020), for example when travellers engage in activities during the journey (Malichová et al., 2022) or when their travel motive is to 'escape' to a more distant location (van Wee & Mokhtarian, 2023). Previous research also showed that larger distances for holidays are associated with higher utilities (Van Cranenburgh et al., 2014). Even though, the study of Van Cranenburgh et al. (2014), has a maximum range of 1500 kilometres which is outside the scope of this research, this is still interesting to take into consideration. Yet, tourists also seem to cover larger distances to experience changing scenery and climate (Jeuring & Peters, 2013). Changing scenery and climate could affect cultural distance or novelty seeking that positively influence tourists intention to visit a destination (Bi & Gu, 2019).

As previously discussed, the concept of distance can be understood in both the physical or relative dimension (Larsen & Guiver, 2013). Therefore, the definition used for distance in long-distance travel differs in tourism literature since it is hard to define. It could for example be defined by the presence of an overnight stay (Christensen, 2016), by trips that exceed 100 kilometres one way (Åkerman et al., 2021; Janzen et al., 2018; Malichová et al., 2022), or by different perceptions of distance (Larsen & Guiver, 2013). Long-haul flights are defined by Christensen, 2016 as flights crossing more than 4000 kilometres. In this research, physical long-distances are measured in kilometres as a physical metric, aiming to enhance our understanding of the importance of distance in the choice of a holiday destination.

The holiday destination in itself seems to have an influence on the choice of a holiday destination. So it is expected that when a holiday destination is seen as more attractive, people are willing to travel longer distances. The factors influencing the attractiveness of a holiday are further explained in section 3.2. Since literature showed that distance is most often perceived in travel time and cost, it is expected that distance will have little influence on the destination choice compared to travel time and cost. The factors influencing the trip to a holiday destination are further discussed in section 3.3. Furthermore, since literature showed that there are different perspectives on how distance affects the preferences for holiday destinations, it is expected that socio-demographic characteristics play a role in these preferences. These will be further elaborated on in section 3.5.

3.2. Destination attractiveness factors

A commonly used theory to explain tourism travel behaviour is the push-and-pull theory (Dann, 1977), where the desire to travel is motivated by push factors, and pull factors attract tourists to certain destinations. The pull factors discussed in this section also depend on the socio-demographic characteristics related to the individuals (see section 3.5) (Boto-García et al., 2021). As previously explained, in order to decide which factors are included to determine the attractiveness of a destination, a systematic literature review (see appendix A) has been conducted on the factors influencing destination choices for holidays. This systematic literature review leads to 23 papers considering tourism travel behaviour in destination choices. In Table 3.1, an overview is shown, presenting the factors discussed in the papers.

Table 3.1: Factors influencing holidays found in literature

Author(s) & year	Destination Type	Cultural difference	Prestige	Distance	Climate	Temp-erature	Value for money	Safety	Famili-arity	Food
Douglas et al., 2023	x	x								
Mehmetoglu and Normann, 2013	x		x							
Özdemir, 2022	x			x	x		x			
Boto-García et al. 2021	x			x		x				
Cardoso et al., 2020										x
Yoo et al., 2018	x									
Keshavarzian and Wu, 2017							x			
Baloglu, 2001									x	
Björk and Kauppinen-Räisänen, 2017										x
Karl and Reintinger, 2017	x									
Steiger et al., 2016	x				x	x				
Garcia et al., 2015									x	
Nikjoo and Ketabi, 2015	x	x								
Karl et al., 2015	x	x						x	x	
Goh, 2012	x	x		x	x	x			x	x
Wu et al., 2011					x	x				
Boley and Jordan, 2023	x						x	x		x
Nicolau, 2008									x	
Barros et al., 2008	x	x		x	x				x	
Seabra, 2013								x		
Bigano et al., 2006	x			x	x	x				
Nicolau and Más, 2006	x				x	x				
Liu et al., 2018		x		x					x	

To consider the attractiveness of a destination, a distinction has to be made between factors that contribute to the attractiveness of a destination and factors that are related to the trip to the destination. Therefore, distance, travel time and costs are not taken into account in this section. Furthermore, prestige is not further discussed in this section since it was only found in one of the papers. Other factors such as purpose, holiday duration, transport mode and season are not included in the table since varying these factors is out of the scope of this research. The factors found in the literature are discussed below. Through snowballing, some additional papers are included in this literature review.

Destination type is an important motivation for the holiday destination choice (Nikjoo and Ketabi, 2015, Nicolau and Más, 2006; Douglas et al., 2023). People have diverse motivations for travelling, including novelty-seeking, engaging in physical activities, relaxing, and exploring various cultures (Mehmetoglu and Normann, 2013; Özdemir, 2022). For rural tourism destinations, outdoor activities, nature, landscapes and relaxation play an important role in the decision-making process (Velea et al., 2022). Similarly, for cultural tourism destinations, cultural activities such as visiting museums or cultural heritage have influence on the destination choice (Manwa et al., 2016). Tourists have different motivations for visiting specific destinations, therefore it is important to consider these motivations with their related activities.

Cultural difference is a key factor in destination choice for tourists since it gives a different perspective on the distance between two countries (Bi & Gu, 2019). The cultural distance reflects the degree of cultural differences between the tourists' home country and the destination country (Karl et al., 2015). Certain findings suggest that the presence of cultural differences can have a negative effect on destination selection, leading tourists to prefer destinations that have cultural similarities with their home countries (Vietze, 2012). While other findings show a positive effect on destination selection (Bi and Gu, 2019; Lee et al., 2018). Liu et al. (2018) found that cultural difference influences destination choice positively among individuals highly motivated by cultural factors, while it exerts a negative influence on those with lower cultural motivation.

Weather and climate conditions play an important role in the destination choice for a holiday (Wu et al., 2011; Bigano et al., 2006). Climate information influences the available activities, holiday timing and overall holiday experiences, potentially impacting future travel decisions (Gössling et al., 2016). In a study conducted by Kozak (2002), German and British tourists in Mallorca and Turkey were surveyed, revealing that one of the primary motivations for travel was 'enjoying good weather'. The research of Goh (2012) identified similar results for the regions United States, United Kingdom, Japan and Canada. Steiger et al. (2016), found that a temperature between 21 and 25 degrees Celsius is the perfect temperature range. Where temperatures that fall below 15°C or rise above 30°C are considered unacceptable. According to Nicolau and Más (2006), tourists are ready to travel longer distances for a preferred climate.

Safety influences the destination choice of tourists (Boley and Jordan, 2023; Seabra et al., 2013). There are several types of risks that could affect safety including natural disasters, health risks, criminality, political instability, or terrorism. Karl et al. (2020) indicate that tourists are more likely to change their holiday destination considering political instability and terrorism, than when considering natural hazards. It also illustrates that the socio-demographic factors age and gender influence the perception of risks and travel behaviour. Additionally, Karl et al. (2015) suggest that "dangers at the destination" or "political situation" issues are very influential in the decision-making process, making other factors less relevant.

Familiarity with holiday destinations also influences the holiday destination. Familiarity with a destination can be categorized into several dimensions. In this study, the type of familiarity that is included is experiential familiarity, meaning familiarity based on previous visits (Baloglu, 2001). Previous experience with certain holidays happens to influence future travel behaviour (Barros et al., 2008). People prefer going to destinations that they are familiar with (Baloglu, 2001; Elliot et al., 2011). In these situations, distance probably does not play a substantial role in the destination choice. However, other papers suggest that variety-seeking behaviour can enhance the appeal of more distant destinations (Mokhtarian and Salomon, 2001; Nicolau and Más, 2006). When a person has not visited a destination before, they tend to exhibit a greater willingness to travel long distances (Moutinho & Trimble, 1991). The paper of Nicolau (2008) agrees with this as it found that the interest of discovering new places increases the willingness to travel further distances, and therefore variety-seeking behaviour, or familiarity, seems to be sensitive to distance.

Food is a motivation that tourists often seek when travelling to create new experiences (Ji et al., 2016), and it can also act as a trigger for destination choice (Cardoso et al., 2020). Furthermore, Björk and Kauppinen-Räisänen (2017) conducted a research to explore the impact of food-related interests on travel motivations and destination choice. Their findings revealed that an individual's attitude towards food influences their travel motivations and destination preferences, with the strongest link being in 'food and local culture.' This is characterized by tourists who appreciate the originality and local aspects of the food as part of the destination's culture. Food also contributes positively to the satisfaction of tourists and their likelihood to return (Lertputtarak, 2012).

Taking the described factors found in the literature into account together with the interview outcomes (see section 3.4), the attributes and attribute levels to include in the choice experiments are selected and discussed in the next chapter 4.

3.3. Trip-related factors

Section 3.1 showed that distance to a destination is mostly determined by travel cost and time. Travel costs have a negative effect on destination choice (Cao et al., 2020). Also, an increase in travel time is associated with a decrease in the likelihood of choosing that destination (Wu et al., 2011). However, when increasing the travel distance, more attractive holiday destinations can be reached. It was found that the attractiveness of a destination plays an important role in the decision process for choosing a holiday destination (Wu et al., 2011). The attractiveness of a destination was here described as the number of people travelling to the destination per year and happens to have a positive influence on the choice of a destination. However, in this study, the attractiveness of a destination is based on a number of holiday-related factors discussed in the previous section 3.2. Still, it is expected to have a positive influence on destination choice. This results in a trade-off between the distance, travel time, travel cost and the attractiveness of the destination. Despite that a greater distance can lead to more attractive destinations, it is still expected that distance in itself will have a minimal effect on the choice of a holiday destination, considering that distance is usually determined by travel time and cost.

Besides travel expenses, there are also other costs associated with a holiday, such as accommodation, food, and activities. Larsen and Guiver (2013) found that these costs incurred at the destination occur to be more important than travel costs.

Another interesting aspect regarding travel time and cost is the value of travel time (€/h). A recent study by Knoope (2023) showed that the value of travel time for travelling with a plane is about 62 euros on average in the Netherlands. Meaning, that people are willing to pay 62 euros to save one hour of travel time by plane on average. This value is much higher for travelling by plane for business purposes. This value is 110 euros. The value of time for travelling by plane for private purposes is about 54 euros in the Netherlands. This means that people in the Netherlands are willing to pay 54 euros to save one hour of travel time for travelling by plane for private purposes.

Considering the factors influencing trip choice as described, the attributes and attribute levels to include in the choice experiments are selected by taking the interview outcomes (see section 3.4) into account. This is discussed in chapter 4.

3.4. Interview outcomes

As mentioned in the methodology chapter, interviews are conducted to highlight the various factors that individuals consider when selecting a destination. More details about these interviews are explained in subsection 2.3.2. This is particularly valuable as it provides additional insights regarding people's decision-making processes. It also allows for an evaluation of how well the existing literature aligns with the decision-making process of the interviewees. 20 people were interviewed and asked what their most recent holiday destination was using the plane as transport mode and why they chose this destination. The ages varied between 24 and 63, 8 men and 12 women were interviewed. Some travelled with children, some travelled alone or with a friend or partner. More details on the interview outcomes can be found in Appendix B.

The most interesting findings were that almost everyone mentioned the type of holiday they were looking for, as well as the climate and temperature. Some said they were going back to a destination where they had good memories, while others said they wanted to discover a new place. Distance was mentioned a couple of times by interviewees who went to a destination far away. They preferred to be far away to discover different cultures, but also because it felt more as an adventure as the ability to quickly return home is limited by the distance. On the other hand, short distance was also named as a reason for a destination, especially by people travelling with kids, due to decrease the travel time and easy accessibility. The ticket price was also mentioned a couple of times. For example, someone wanted to go to Asia and chose the country within Asia with the best (lowest) ticket price. The price of the accommodation was also mentioned. Someone wanted to go to Spain and chose for a specific city to fly to since the accommodation there had a better price. Furthermore, food was mentioned a few times as one of the reasons to choose a specific destination. After speaking with the interviewees, it became evident that also according to the literature, safety is a crucial factor to consider when selecting a holiday destination. However, countries that are unsafe are automatically ruled out as a viable option for the holiday. In essence, destinations lacking in safety are not even considered as potential choices for holidays. This concept is called 'consideration set'. When people can choose between different options, they often do not consider every possible available option. Instead, they reduce their options to a more manageable set of options that they find relevant or acceptable. So, people may have access to many options, but only a limited number of them come to the forefront or are considered important in a specific context (Shocker et al., 1991).

3.5. Socio-demographic characteristics

Socio-demographic characteristics, which can shape the preferences and choices of individuals, may impact tourists' travel motivations when making choices (Yoo et al., 2018). Özdemir (2022) also indicated variations in travellers' destination preferences based on their socio-demographic characteristics. (Lyons et al., 2009) found that distance has a negative effect on the choice of a destination for people travelling with children. It appears that people travelling with children prefer shorter distances to their holiday destination. Nicolau (2008) found that the socio-demographic characteristics income, number of children and the size of the city of residence have a significant response to distance. People with a higher income preferred larger distances, compared to people with a lower income. People travelling with children younger than 16 years preferred holiday destinations closer to home. Furthermore, people living in large cities preferred destinations further away than those living in smaller cities. This desire contributes to an increased likelihood of travelling longer distances, prompting individuals to travel away from cities characterized by high population density (Eymann & Ronning, 1997).

In the next chapter (4), an overview of the selected socio-demographic characteristics is shown. Apart from the discussed characteristics it was decided to include education, work status and travel frequency as well. These characteristics give a more complete understanding of the respondent and have also been utilized in other papers considering tourist travel behaviour (Karl and Reintinger, 2017; Keshavarzian and Wu, 2017; Garcia et al., 2015; Karl et al., 2015).

3.6. Conceptualization

In the previous sections, more information is given on the factors that influence choice behaviour for holiday destinations. To conceptualize this, the following visualization has been made (figure 3.1). The blue block represents the socio-demographic characteristics that have been taken into account. The orange-coloured blocks represent the factors corresponding to the destination attractiveness or the trip characteristics. The trip characteristics are split into two choice experiments the *Choice experiment presenting all attributes* and the *Choice experiment not presenting travel time and cost*, as earlier explained in the setup structure of the experiments 2.3.1. The yellow block symbolizes the scores retrieved from the rating experiment which is related to the 'destination attractiveness' attribute in the choice experiments. The green circles indicate the utility gained from the chosen alternative. The purple blocks show the chosen alternative of the given choice set in the choice experiment.

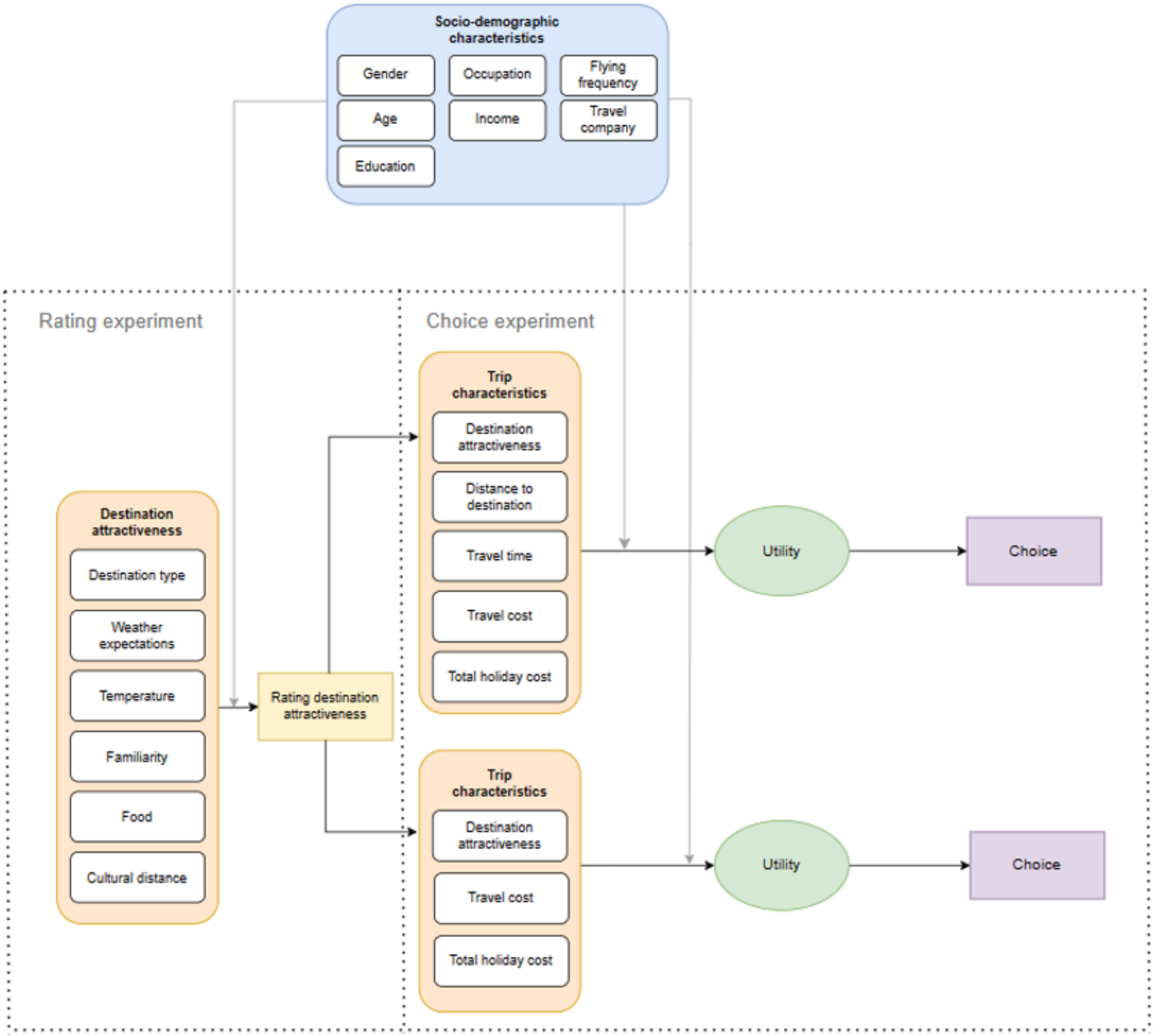

Figure 3.1: Conceptualization

4. Attribute selection and Survey Design

This chapter outlines the development of the online survey. First, the context setting for the survey respondents is explained (4.1). Next, the attributes and attribute levels utilized in the experiments are selected (4.2) as well as the socio-demographic characteristics (4.3). The fourth section (4.4), explains the experimental designs employed in both the rating experiment and the choice experiments. Subsequently, the presentation of the experiments is shown (4.5). The chapter then delves into the structure of the survey (4.6). Finally, modifications made to the survey are described as a result of the survey test (4.7) and expectations for the model results based on the selected attributes and attribute levels are described (4.8).

4.1. Context setting

In this section, the contextual setting for the respondents of the survey is described. According to Yoo et al. (2018), preferences for holidays among tourists may vary based on socio-demographic characteristics, type of travel, duration, purpose, and destination setting. Therefore, it is important to prompt the respondents to envision a specific setting. The socio-demographic characteristics of a respondent are asked for in the survey. The destination setting is given in the rating experiment as one of the varying attributes. Type of travel, duration and purpose do not appear in the rating or choice experiment. Hence, this information is provided to the respondents to imagine the context setting for their holiday. The statement for the context setting is as follows: *"Imagine that you are going on a two-week holiday by plane during the summer period. You depart from Schiphol."* This statement provides all the necessary information for respondents to imagine for completing the survey.

The type of travel is indicated by the information that it involves travelling by plane. A two-week holiday has been chosen as duration of the trip. This was chosen because this research involves long distances for holiday destinations. In the literature it was found that there is a positive relationship between the spatial distance and the length of stay; since higher travel costs are involved, tourists are encouraged to stay longer at a destination (Jackman et al., 2020). This could create the perception that tourists are optimizing their value for money. Additionally, the statistics of CBS (2023a) show that on average, Dutch people go on holiday for 14.0 days per year during the summer season. The average duration of a summer holiday is 9.5 days. This average includes weekend trips that typically take place within Europe. Since this study assumes that the tourist travels a minimum distance of 2000 km, it is decided for this research that this holiday consists of 14 consecutive days. Subsequently, this statement implies that the respondent will go on a holiday in summer, thereby excluding business trips and winter sports holidays. Additionally, it can be assumed that, given the lack of information about the location of the destination, respondents are not able to know if there is an option to visit family and friends at the destination. Therefore, it can be assumed that this is not taken into account in the considerations of the respondent. At last, the point of departure is specified, which is Schiphol (Amsterdam). Given that this survey is focused on Dutch citizens and given that the distances included in the survey include intercontinental flights, Schiphol is the most obvious location to depart from.

4.2. Selection of attributes and attribute levels

The following two subsections elaborate on the attribute and attribute level selection of both the rating experiment (4.2.1) and the choice experiments (4.2.2).

4.2.1. Rating experiment attributes

Based on the literature and the interviews, destination type, weather expectations, temperature, familiarity, food and cultural distance have been selected as attributes to include in the rating experiment (see table 4.1, see appendix C.1 for Dutch translation which was used in the survey). Weather expectations and temperature have been split into two attributes since temperature and weather can vary considerably. Safety has not been selected since the interviews revealed that safety is not an attribute that people consider when choosing to visit a destination, but rather a factor that influences them not to choose a particular destination.

Table 4.1: Rating experiment

Rating experiment

Attributes	**# Levels**	**Attribute levels**
Destination type	3	Active holiday: nature, mountains, parks, forests Sightseeing holiday: city, culture, musea Relaxing holiday: sun, see, beach, pool
Weather expectations	3	Cloudy with sun Rainy with sun Sunny
Temperature	3	18-24 degrees Celsius 24-30 degrees Celsius 30-36 degrees Celsius
Familiarity	3	Familiar with destination, have visited Unfamiliar with destination, also no friend have visited Unfamiliar with destination, recommended by friends
Food	3	Rich local, authentic, traditional food Western food Combination of rich local, authentic, traditional food and Western food
Cultural differences compared to the Netherlands	3	Almost no cultural differences Some cultural differences A lot of cultural differences

The levels for destination type are chosen to create the idea of the main things to do at that destination. The levels are active holiday, sightseeing holiday and relaxing holiday. People's preference for the main holiday activity varies and influences the attractiveness of a destination. Weather expectations and temperature are varied into three levels that are mainly common within the expectations people have for their summer holiday destinations. For example, in a tropical climate, it can be very warm but it can also be very rainy alternating with the sun. Also, when you prefer an active holiday, it might be better to look for a climate that is not too warm and also a bit cloudy. The levels for familiarity were inspired by Liu et al. (2018), where the levels for familiarity were described by self-reported familiarity, informational familiarity and experimental familiarity. Some people prefer going to places they are familiar with, while others prefer to explore new places. Then also a distinction can be made between whether you go to a destination because many friends have been there and had good experiences. Or you go to a destination as one of the first of your friends as it might feel more like an adventure. The levels for food were hard to decide upon since it is difficult to decide what type of food is common to people. Therefore, the levels were chosen as 'rich local, authentic, traditional food' (referring to food eaten in specific countries), 'Western food', and a combination of these two. The levels of the cultural differences refer to the degree of difference compared to the Netherlands.

4.2.2. Choice experiment attributes

As explained in subsection 2.3.1, the DCE is divided into two versions. The trip attributes that are included in version 1 of the DCE are the destination attractiveness, distance to destination, travel time, travel costs and total holiday costs (excluding the travel costs). Therefore this version is called *Choice experiment presenting all attributes*. Destination attractiveness is the outcome of the rating experiment and gives an idea of how the unlabeled destination of the choice set is rated. The distance to destination refers to the distance from Amsterdam to a destination in a straight line, so without considering the routes, measured in kilometres. The travel time encompasses the door-to-door travel time, which may include a transfer. The travel costs are the total costs of the whole journey (e.g. train plus flight ticket). The total holiday costs are the total expenses of the holiday excluding the travel cost to the destination but including costs for travelling within the country, accommodation, food and activities. These costs are included since they happen to be more important than the travel costs (Larsen & Guiver, 2013). The travel costs and the total holiday costs are separated in the first version of the choice experiment to see if people react differently to both types of costs. It might be possible that someone prefers not paying too much for the journey to the destination, but is willing to pay a certain amount of costs at the destination.

The attributes included in version 2 of the DCE are only the destination attractiveness, the distance to the destination and the total holiday costs (including travel costs). Therefore, this version is called *Choice experiment not presenting travel time and cost*. Travellers tend to reduce their travel time and costs (Larsen & Guiver, 2013). However, Nicolau and Más (2006) found that tourists motivated by cultural aspects and discovering new places, both are willing to pay higher prices for destinations that fit their expectations. Travel time and cost to a destination are determined by the distance to that destination, meaning that travel time and cost are intertwined with distance. So to investigate if distance has an intrinsic value in itself, the travel time and cost should be controlled for. Therefore, travel time is excluded from the DCE and travel cost is not separately named in version 2 of the DCE: *Choice experiment not presenting travel time and cost*. The total holiday cost is included since it does not only contain the travel cost, but also the expenses at the destination. This approach provides respondents with a more comprehensive understanding of the available alternatives.

Table 4.2: Version 1: Choice experiment presenting all attributes

Choice Experiment presenting all attributes

Attributes	# Levels	Attribute levels	Unit
Destination attractiveness	3	6	rating
		8	rating
		10	rating
Distance	3	2000	kilometres
		5500	kilometres
		9000	kilometres
Travel time (door-to-door)	3	10	hours
		13	hours
		16	hours
Travel costs per person	3	300	euros
		600	euros
		900	euros
Total holiday costs per person (excl. travel costs)	3	700	euros
		1400	euros
		2100	euros

Table 4.3: Version 2: Choice experiment not presenting travel time and cost

Choice Experiment not presenting travel time and cost			
Attributes	**# Levels**	**Attribute levels**	**Unit**
Destination attractiveness	3	6	rating
		8	rating
		10	rating
Distance	3	2000	kilometres
		5500	kilometres
		9000	kilometres
Total holiday costs per person (incl. travel costs)	3	1000	euros
		1300	euros
		1600	euros
		1700	euros
		2000	euros
		2300	euros
		2400	euros
		2700	euros
		3000	euros

Tables 4.2 and 4.3 show the attributes with their associating attribute levels (see Appendix C.2 for Dutch translation which was used in the survey). For all selected attribute levels, it is advantageous to maintain equal distances (equidistance) between the attribute levels, as it ensures orthogonality between the attributes (Molin, 2022). Orthogonality means no correlation between the attributes. This absence of correlation enables the separate estimation of parameters. Destination attractiveness only represents levels which fit in the 'consideration set' of respondents. It is assumed that a 5 or lower will automatically be a 'no-go' for respondents. Therefore, the levels for destination attractiveness are 6, 8 and 10. To determine the levels for distance, a minimum and maximum range was chosen. The minimum range was chosen to be 2000 kilometres since this distance requires a flight covering a relatively short distance and is not too close to home to easily substitute it with a car or public transport. Also, this distance includes popular holiday destinations such as Spain, Portugal or the south of Italy. The maximum distance range should include destinations such as South Africa, Panama and Thailand. Destinations covering larger distances could lead to surrealistic choice sets and therefore the maximum distance range was chosen to be 9000 kilometres. To maintain equidistance, the other distance is chosen to be 5500 kilometres. The levels 2000, 5500, and 9000 kilometres are visualised on a map in Figure 4.1. For travel time, the levels have been chosen in a way that it is credible that the travel times align with all the distance levels. Hence, the minimum travel time is set at 10 hours and the maximum travel time at 16 hours. The level in between is 13 hours, to maintain equidistance between the attribute levels. The levels for travel costs have been chosen by comparing tickets to different destinations and from different tour operators. Travelling off-season and buying a ticket with a discount, could make it possible that a flight that covers a long distance costs only €300. While it is more common that such a ticket is more expensive. On the other hand, when you buy a last-minute ticket for a short flight it is possible that such a ticket costs €900. However, it is more common that a ticket for a short flight is less expensive. Therefore, the chosen levels are €300, €600 and €900. The levels for holiday costs (excluding travel costs) are decided in a similar way to the travel cost. It is assumed that the holiday takes two weeks. Several estimations were made including two weeks backpacking in Asia to more a luxurious two-week holiday. The levels have been chosen in such a way that when the travel costs are added to the total holiday cost (excluding travel cost), there is no overlap between the total holiday costs when the travel cost is included, as applied in version 2 of the DCE: *Choice Experiment not presenting travel time and cost*. Resulting in the levels €700, €1400 and €2100.

Figure 4.1: Distance range

4.3. Selection of socio-demographic characteristics

Section 3.5 gave an overview of the socio-demographic characteristics that have an effect on distance in holiday destination choice found in the literature. The socio-demographic characteristics included in the questionnaire are gender, age, education, work status, income, travel company, household, living environment and flying frequency. (see table 4.4, see appendix C.3 for the Dutch translation which was used in the survey).

Table 4.4: Socio-demographic characteristics

Socio-demographic characteristics	
Variable	**Category**
Gender	Male
	Female
	Other
	Prefer not to say
Year of birth	(open question)
Educations (levels based on Dutch school system)	Basisonderwijs
	Vmbo
	Havo
	Vwo
	MBO
	HBO
	WO
	Other
Work status	Student
	Not working
	Working (fulltime)
	Working (parttime)

Variable	Category
	Retired
	Prefer not to say
	Other
Income (bruto per year)	0 - 10,000 €
	10,000 - 20,000 €
	20,000 - 30,000 €
	30,000 - 40,000 €
	40,000 - 50,000 €
	50,000 - 60,000 €
	60,000 - 70,000 €
	70,000 - 80,000 €
	80,000 - 90,000 €
	90,000 - 100,000 €
	100,000 +
	Prefer not to say
Travel company	Alone
	With a friend
	With a partner
	With a partner and kids
	Without partner and kids
	With parents
	Other
Household	Live with a partner
	Live with partner and kids
	Live alone
	Live without partner, with kids
	Live with friends
	Other
Living environment	Big city: > 350.000 citizens (Amsterdam, Rotterdam, Den Haag, Utrecht)
	Middle big city < 100.000 - 350.000 citizens
	Large village
	Small village
	Rural area
	Other
#Continental flights for holiday reasons in the past 5 years	0 times
	1-2 times
	3-5 times
	6-10 times
	11 times or more
#Intercontinental flights for holiday reasons in the past 5 years	0 times
	1-2 times
	3-5 times
	6-10 times
	11 times or more
#Flights for private reasons in the last 12 months	0 times
	1 time
	2 times
	3 times

Variable	Category
	4 times 5 times 6 times or more
Average number of flights per year	0-1 times
	1-2 times 2-3 times 3-4 times 4-5 times 5 times or more

4.4. Experimental design

Some elements of the experimental design have already been explained in the methodology chapter (subsection 2.3.3). The choice for use of unlabelled alternatives was for example already decided. However, the choice for the kind of design was not specified yet. This will be explained in the next subsections for the rating experiment and the choice experiments subsequently.

4.4.1. Rating experiment

The first experiment in the overall research is the rating experiment. Here, the independent subjective attribute 'destination attractiveness' which is included as a dependent attribute in the second experiment, the choice experiment, is estimated. The destination attractiveness is rated among the dependent underlying tangible attributes to indicate the perceptions of respondents on certain destinations. The rating experiment seeks to assess how each underlying attribute contributes to the rating of destination attractiveness. The analysis is carried out through a linear regression analysis to estimate the correlations between the attractiveness attributes and the rating of the destination attractiveness. In the rating experiment, respondents are asked to evaluate the destination attractiveness by taking into account several specific attributes. The scale of rating the attractiveness of a destination is from 1 (not attractive) to 10 (very attractive).

For the rating experiment, it has been decided to apply an orthogonal design instead of an efficient design, since there are no choice sets in this experiment. The rating is conducted for each destination individually, ensuring that the evaluation is exclusively based on the specific destination characteristics. The given alternatives in the rating experiment contain 6 attributes with 3 levels each. Meaning that there are 18 profiles needed to create an orthogonal design which is attribute level balanced and has zero correlations. 18 profiles is a large number of rating tasks for respondents to fill in. Therefore, it is decided to split choice sets into two blocks of 9 rating tasks each. Each respondent is randomly assigned to one of the two blocks. More details about the method for deciding the number of profiles, the Ngene syntax and the constructed experimental design can be found in Appendix D.1. The described constructed experimental design in this appendix gives the design with 5 attributes. This is because after testing the survey some misunderstandings appeared. This will be discussed in section 4.7.

4.4.2. Choice experiments

The second experiment in the overarching research is the DCE. DCE is used to quantify individuals' preferences when they must decide between multiple choices among competing alternatives. The results of a DCE offer valuable insights into the consumer preferences. Researchers can also use this data to predict how changes of attributes of alternatives might affect choice behaviour. The key elements of a DCE include attributes, attribute levels and the experimental design. The chosen attributes and attribute levels create an alternative. The choice between two or more alternatives result in the choice set. The experimental design is dependent on the number of chosen attributes and attribute levels.

This experiment is divided into two versions of the survey, both containing the rating experiment, but the presentation in the survey of the choice experiments differs in two separate experiments: the *Choice experiment presenting all attributes* and the *Choice experiment not presenting travel time and cost*.

The choice experiment is designed using a D-efficient design. First, the design was created using an orthogonal design, yet dominant choice alternatives occurred. Dominance does not offer any extra insights into the trade-offs. The efficient design prevents this by balancing the utilities of the alternatives in the choice sets. The D-efficient design was chosen as it increases the overall reliability of the parameters. Other advantages of efficient designs are that it reduces the number of choice sets to arrive at the same reliability and the information of the trade-offs is maximized. This design type is based on prior information to maximize the information about the trade-offs. The prior information is at the same time the disadvantage of efficient designs because the parameters may be biased when this prior information is incorrect. The priors are obtained from literature and by estimating the parameters in proportion to each other. The efficient design leads to 12 profiles for the two choice experiments. To reduce the number of choice tasks to fill in by the respondents, the choice sets are split into 2 blocks of 6 profiles each. The respondents are randomly assigned to one of the two blocks of one of the two choice experiments. More details on how the priors are obtained can be found in Appendix D.2. Also, the Ngene Syntax and the constructed experimental design can be found here.

In the D-efficient design, orthogonality is not required. The outcomes of the constructed experimental design indeed shows that there are correlations. Also, the design overall is attribute level balanced. However, per block, some levels appear 3 or 5 times instead of 4 times.

As previously explained in the choice experiment has two different versions. However, the experimental designs are the same. Hence, only the attributes destination attractiveness, distance and total holiday cost (which includes the travel cost) are presented to the respondent. By keeping the experimental designs the same for the experiments of the two versions, the possibility that the differences in the analyses are due to a different experimental design is eliminated.

4.5. Presentation of survey experiments

The rating experiment and the choice experiments presented in the survey are shown in Figure 4.2 and Figure 4.3. The attributes presented on the left side of the blue box stay the same while the levels presented in the blue box differ per question. Version 1: *Choice experiment presenting all attributes* presents travel cost and total holiday cost separately. While version 2: *Choice experiment not presenting travel time and cost*, only presents three of the attributes where travel cost and total holiday cost are summed up.

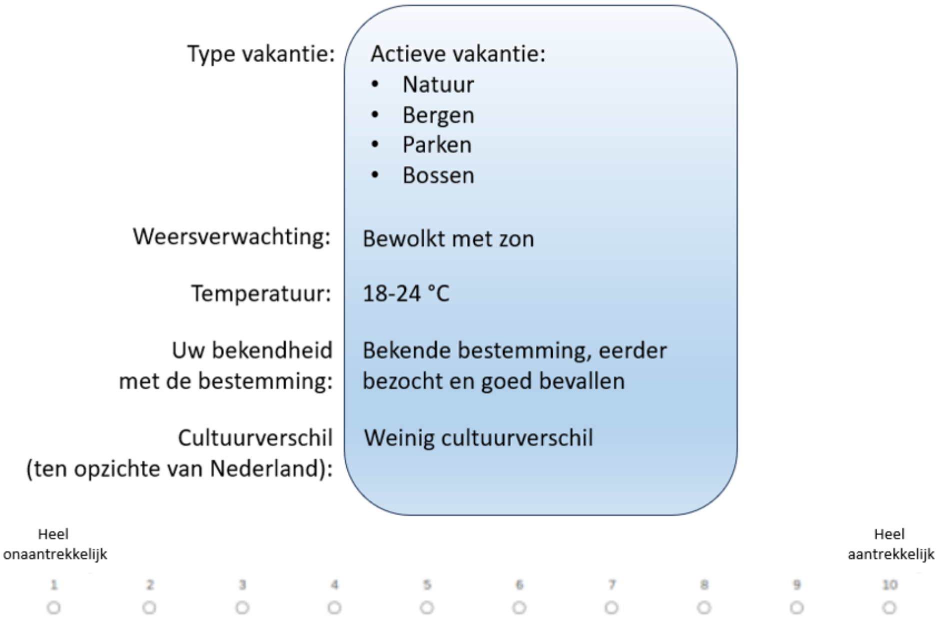

Figure 4.2: Example rating experiment

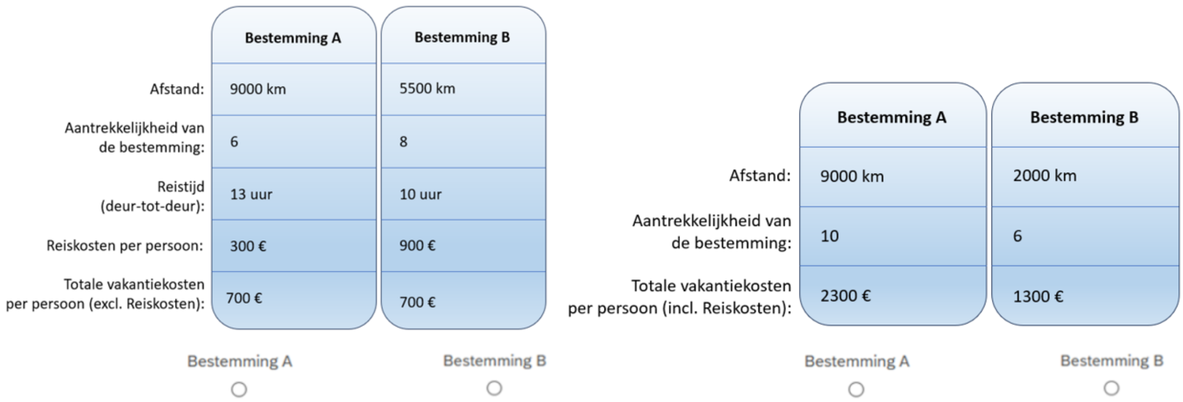

Figure 4.3: Example choice experiments, version 1: *Choice experiment presenting all attributes* (left) and version 2: *Choice experiment not presenting travel time and cost*

4.6. Survey structure

The survey is written in Dutch to ensure that only Dutch people fill in the questionnaire. Which is important since the focus of this research is on Dutch tourists. The survey is designed in Qualtrics, a software that provides tools to conduct online surveys. The structure of the survey is explained below. An overview of the structure survey can be found in Appendix E.

Introduction

On the first screen the respondent sees, the introduction to the survey is given. Here, it is very shortly described what the survey is about. Not much information is given to prevent the respondent from being biased. Furthermore, it is also explained why this survey is conducted, that it is anonymous, and that participation is entirely voluntary. Additionally, an informed consent is signed by the respondent in order to continue to the survey. If a respondent does not agree with the conditions, he or she is not allowed to complete the survey.

Filter question
The target population for this survey is someone who has recent experience with travelling by plane for a holiday and is Dutch. Since the survey is written in Dutch, it is assumed that the respondents who fill in the survey are Dutch. To check if a respondent has recent experience with travelling by plane for holiday reasons, a filter question is added. This question asks if a respondent has travelled at least once by plane for holiday reasons within the last five years. If a respondent has to answer 'no' he or she will be sent to the end of the survey where he or she will be thanked for participating.

Travel behaviour
The current travel behaviour of a respondent is captured by asking four questions about their flight activities over the past five years and their average annual flying frequency.

Rating experiment
In this part of the survey, the respondent will randomly be assigned to one of the two blocks of the rating experiment. First, the respondent sees the statement about the context setting. Then, an explanation of the rating experiment is shown. Followed by nine rating tasks.

Choice experiment
Here, again the respondent will randomly be assigned to either one of the two blocks of version 1: *Choice experiment presenting all attributes*, or to one of the two blocks of version 2: *Choice experiment not presenting travel time and cost*. Similarly to the rating experiment part of the survey, the respondent is again presented with the context setting statement, the explanation about the choice experiment, followed by seven choice tasks. Six of the choice tasks belong to the experimental design. One task is added as a control question. This is the seventh choice task which is similar to one of the choice tasks the respondent had already answered. This is a way to validate if the respondent was still focused at the end of the choice tasks.

Value of distance
The last two questions asked in the survey are asked to obtain some extra information about how respondents think of distance regarding holiday destinations. They are first asked to what degree they agree with the statement: "I take the distance to a country or city into account in my choice of a holiday destination." Next, an open question is asked about the reason the respondent has for considering distance.

Socio-demographic characteristics
At the end of the survey, the socio-demographic characteristics of the respondents are asked for. These questions are strategically positioned at the end of the survey since these are not the most interesting questions for a respondent to fill in.

Expression of gratitude
The final part of the survey thanks the respondent for participating in the survey. Also, the email address of the author is provided and there is space to leave comments or questions.

4.7. Survey testing

After the survey had been tested, some changes were made to the survey. Some general adjustments had to be made as well as more influential adjustments to the experiments. It appeared that an example was missing in the explanation of the experimental designs. Adding an example created more clarity. Furthermore, since there was quite a lot of information in the explanation of the experimental designs, respondents did not read the context-setting statement. To tackle this problem, the statement is presented on a separate page in the survey. Also, some formulations were adjusted. The average time it took for the test respondents to fill in the survey was 8 minutes and 21 seconds.

4.7.1. Rating experiment

In the rating experiment, it turned out that the attributes food and cultural difference could cause confusion. This was because the combination of Western food and large cultural difference is hard to imagine.

The other way around the combination rich local, authentic, traditional food with almost no cultural difference created a similar problem. For this reason, it was decided to exclude the attribute food from the rating experiment. Food can also be seen as part of a culture (Cuevas et al., 2017; Cuevas et al., 2021). Therefore, food is now incorporated into the description of cultural difference, providing respondents with a contextual understanding of what to consider in relation to cultural differences.

4.7.2. Choice experiments

The levels of attractiveness appeared to be too far apart, which could create dominance. Destinations which had an attractiveness rate of 10 were almost always chosen above a rate of 6, despite of the other attributes. To avoid this, the levels are changed to 6, 7 and 8. Since the distances between the levels are smaller now, the priors also had to be changed. The chosen priors are explained in the appendix D.2. The downside of changing the maximum rating score from 10 to 8 is that extrapolation is needed to make statements about a score of 9 or 10. Extrapolating reduces the reliability of the results. Additionally, the order of the attributes presented to the respondents in the choice experiment is changed. It is decided to position the attribute distance at the top so the respondent sees this attribute probably first. This could prevent the respondent from overlooking it.

4.8. Expectations

The final selection of attributes and their corresponding levels for the experiments has been determined. This section provides an explanation of the expected results. The expectations of the linear regression model are explained in subsection 4.8.1, followed by the explanation of the MNL model in subsection 4.8.2.

4.8.1. Expectations linear regression model

The preference for the type of holiday is very subjective per respondent for what type of holiday he or she is looking for. No clear effects are therefore expected regarding the type of holiday. It is however expected that weather expectations with rain have a negative effect on the rating score of a holiday destination, while weather expectations with only sun and sun and clouds have a positive effect. Where the effect of only sun is expected to have a larger effect than sun with clouds. For temperature, it is expected that a temperature between 18 and 24, and 24 and 30 degrees Celsius have positive effect on a holiday destination score, and temperatures above 30 degrees Celsius are valued negatively, as was discussed in the literature section 3.2. For familiarity, similar as for type of holiday destination, no clear effects are expected since this is also very subjective per respondent. The effect for cultural difference is expected to be positive for holiday destinations where there is a lot of cultural difference. The destinations where there is some or no cultural difference are expected to be valued with only small negative effects. This is expected since people are travelling outside of the Netherlands to experience other activities, food, and climate, which could be related to other cultures.

4.8.2. Expectations MNL model

There is a lot of literature that describes different perspectives of distance on holiday destinations. Many papers suggest that distance is often captured in travel time and or cost (Jeuring and Haartsen, 2018; Bi and Gu, 2019; Larsen and Guiver, 2013). Holiday destinations further away increase the travel time and cost, while these two attributes are often preferred to be reduced. However, an increased range in distance for a holiday destination ensures that more attractive holiday destinations can be reached. In the choice experiment where distance, travel time and travel cost are presented separately (version *Choice experiment presenting all attributes*), distance has been detached from other attributes travel time and cost, and could in this way be treated as a separate attribute on itself. Therefore, it is expected that in this choice experiment, distances further away have a positive effect on the choice of a holiday destination. For attractiveness it is expected that people prefer holidays with a higher attractiveness score over holidays with a lower attractiveness score. For this reason, attractiveness is expected to have a positive effect on the choice of a holiday destination. Travel time, travel cost and total holiday cost are expected to have a negative effect on the choice of a holiday destination, as these three attributes are preferred to be minimized. The magnitude of total holiday cost is expected to be larger than travel cost since total holiday costs were found to be more important (Larsen & Guiver, 2013).

In the other version *Choice experiment not presenting travel time and cost*, the travel time is excluded from the choice experiment and the travel costs are included in the total holiday cost. Since distance is often captured in travel time and cost and both are not explicitly shown in this experiment, it is expected that the effect for distance in the choice for a holiday destination changes into a negative effect because travel time and costs are preferred to be minimized. Another explanation could be that travel time and cost are unconsciously taken into account in the perception of distance. For attractiveness and total holiday costs, similar expectations are expected, as in the other version.

5. Survey statistics

This chapter discusses the statistics of the survey and the coding schemes that were implemented to transform the attribute levels into effects coding. First, the data cleaning and preparation are explained in section 5.1. Followed by the survey and sample characteristics in sections 5.2 and 5.3 subsequently. Next, the statistics of the rating experiment are discussed in section 5.4 and at last, the statistics of the choice experiment is discussed in section 5.5.

5.1. Data cleaning and preparation

The survey was available for respondents to collect data from the 7th of December until the 18th of December. The survey was spread through 3 different platforms: WhatsApp, SurveySwap.io and SurveyCycle.com. The survey was distributed through the network of the author on WhatsApp, and respondents, including friends and family, shared it further. This resulted in a total of 287 respondents. SurveySwap.io and SurveyCycle.com are platforms for survey exchange. SurveySwap yielded 4 respondents, and SurveyCycle generated 15 respondents. The data collection period resulted in a total of 306 respondents. Among the initial 306 respondents, 7 were excluded as they did not meet the criteria for the target group, having not travelled by plane for holiday reasons in the past 5 years. An additional 44 respondents were removed from the dataset due to incomplete survey submissions, lacking essential data on the choice experiment or socio-demographic characteristics. Furthermore, 1 respondent, although completing the entire survey, was omitted from the dataset because he finished it in less than 180 seconds, and non-trading behaviour was suspected, as explained in one of the next paragraphs. Consequently, the refined dataset consists of 254 respondents.

The expected average time for completing the survey identified from the pilot testing was 535 seconds (8 minutes and 21 seconds). The average time for completing the survey in the dataset was found to be 719 seconds (11 minutes and 59 seconds). This was slightly higher than expected. Therefore it was interesting to identify if there were any outliers. This was done using a box plot. The box plot of the average completion times showed that there were indeed outliers. The most extreme one took 6839 seconds (1 hour, 53 minutes and 59 seconds). One plausible reason for the unusually long duration could be that respondents initially opened the survey but opted to finish it at a later time. The outliers were detected and removed by the Inter Quartile Range (IQR) approach (Benallal et al., 2022). This method and steps for outlier removal is further described in Appendix F. The average time needed to complete the survey after the outliers were removed was 535 seconds (8 minutes and 55 seconds) which comes very close to the expected time. The outliers are only removed for calculating the average completion time of the survey, not for analysing the results obtained from the data.

Other important things to indicate if respondents were possibly unreliable is by checking non-trading behaviour and by checking if the respondents were consistent with the control questions obtained in the choice experiment. Both considering the time the respondent took to complete the survey. Non-trading behaviour is suspected when a respondent chooses the same alternative in all choice sets. Possible reasons for this might be that respondents are disinterested in the survey or too bored to take all choices seriously into consideration. It was found that only two respondents were suspected of non-trading behaviour. One of these two had a completion time of less than 180 seconds and is therefore excluded from the dataset as explained in the first paragraph of this section. The reason for setting the minimum completion time to 180 seconds is that beyond this duration, it is still feasible for respondents to read through the alternatives in the choice experiment while possibly skipping the explanations. The experiments themselves can be completed without necessarily reading the explanations. The decision to retain the other respondent suspected of non-trading behaviour in the dataset is that the completion time was around the average completion time. This makes it challenging to definitively identify non-trading behaviour. There is a possibility that the respondent provided genuine and thoughtful answers. Hence, there was no compelling reason to exclude the responses from the dataset.

The control question is examined as a final step to determine if the dataset contains reliable respondents. The control question was included in the choice experiment to verify whether respondents were consistent in completing the choice experiments. The first and last questions of the choice experiment were therefore designed to be identical. It was found that 23 of the 254 respondents have not consistently filled in the control question. The completion times of these respondents were checked and found to be between 282 and 1928 seconds. Since these completion times do not suspect any odd behaviour, it was decided to not exclude these respondents from the dataset. Although this entails a risk that there may still be unreliable respondents in the dataset.

The last decision made regards the questions about travel behaviour and how people value distance. In the survey, questions were included regarding travel behaviour and the perception of distance. However, due to the limited number of respondents who fly frequently, it becomes challenging to compare this group with those who fly infrequently. Furthermore, despite the initial expectation that the questions about how people value distance would provide valuable insights, the data did not yield significant information. Therefore, as a result of these limitations and findings, it was decided to exclude the questions about travel behaviour and distance perception from the subsequent analyses.

5.2. Survey characteristics

To maintain low correlations between the attributes, it was important to check if the different blocks of the experiments were filled in an equal amount of times. The presence of correlations among attributes result in less reliable estimates and are thus undesirable. Table 5.1 shows that the blocks were almost equally distributed. Block 1 of the rating experiment had 128 respondents, while block 2 had 126 respondents. Since this distribution is very close to each other, it was concluded that there is no concerning difference in the distribution between the blocks. The same applies to the choice experiments, with both versions having 62 respondents in block 1 and 65 respondents in block 2.

Table 5.1: Survey blocks distribution

Version	Observations	Relative percentage
Rating Experiment Block 1	128	50.4%
Rating Experiment Block 2	126	49.6%
Total	254	100%
Choice Experiment Version 1 Block 1	62	24.4%
Choice Experiment Version 1 Block 2	65	25.6%
Choice Experiment Version 2 Block 1	62	24.4%
Choice Experiment Version 2 Block 2	65	25.6%
Total	254	100%

5.3. Sample characteristics

Table 5.2 shows an overview of the socio-demographic characteristics of the sample and the travel behaviour of the sample. Not all the possible answers of the socio-demographic characteristics are displayed, but they are divided into categories. This approach increases the number of individuals within that category compared to presenting the answers separately. Moreover, it simplifies the estimation of the LCCM by reducing the options for class estimations.

Age is defined into 4 categories: 18-30, potentially indicating students or starters. 31-50, potentially indicating the group of working people who possibly have children living at home. 50-64 potentially indicates the group of people who might have older children not living at home anymore. 65+, potentially indicating the group of people who are retired. Education is distributed into 3 categories low, including 'basisonderwijs' and 'Vmbo', middle, including 'Havo', 'Vwo' and "MBO', and high, including 'HBO' and 'WO', adapted from CBS, 2019. Work status is defined in 4 categories: students, Working (fulltime), working (parttime) and other. Other includes not working, retired, prefer not to say, and other. The definition of low, middle, or high income lacks of a universal consensus. In this study, the income categories are low (0 - €30.000 gross per year), middle (€30.000 - €60.000 gross per year) and high (€60.000+ gross per year) comparable to the news article of NOS, 2019. Travel company is defined in 4 categories: travelling with a friend or partner, including 'with a friend' or 'with partner'; travelling with a group of friends; travelling with kids, including 'with partner and kids' and 'alone with kids'; and other, including travelling alone, with parents/guardians or other. For household, similar categories are made: living with a partner; living with kids, including the people 'with partner and kids' and 'alone with kids'; group of friends; and other, including living alone, with parents/guardians or other. Living environment is identified into 2 categories: (middle) big city, including people living in a big city or in a middle big city; and small city or village, including people living in a small city or in a large or small village.

The table below shows that gender is nicely distributed in the sample with a small over-representation of females (55.1%). The people who fall in the age categories 18-30 and 51-64 years old are over-represented in the sample. The people between 31-50 and the people older than 65 years old are under-represented. For education, it can be noted that most people in the sample are highly educated. Work status shows that almost half of the respondents have a fulltime job and a quarter of the sample is a student. This indicates that quite a lot of students are present in the sample population. Income is quite evenly distributed with a small over-representation of low income which is probably due to the number of students who filled in the survey and that the sample population has a lot of people between 18-30 who probably have a low income since they are students or just started working. Most respondents travelled with a partner or friend. For household, it can be noted that most people live with their partner or with friends. This sounds logical since the age categories of 18-30 and 51-64 are over-represented. Where people between 18-30 probably contain many students living with friends and the people between 51-64 probably have older children who do not live at home anymore. The sample is over-represented by people who live in a (middle) big city (64.6%).

Table 5.2: Sample characteristics overview

Socio-demographic char.	Category	Observations	Relative percentage
Gender	Male	112	44.1%
	Female	140	55.1%
	Prefer not to say	2	0.8%
Age	18-30	124	48.8%
	31-50	25	9.8%
	51-64	94	37%
	65+	11	4.3%
Education	Low (Basisonderwijs, Vmbo)	4	1.6%
	Middle (Havo, Vwo, MBO)	34	13.4%
	High (HBO, WO)	214	84.3%
	Other	2	0.8%
Work status	Student	65	25.6%
	Working (fulltime)	116	45.7%
	Working (parttime)	44	17.3%
	Other	29	11.4%
Income (gross per year)	Low (0 - 30.000)	92	36.2%
	Middle (30.000 - 60.000)	72	28.3%
	High (60.000+)	76	29.9%
	Prefer not to say	14	5.5%
Travel company	Partner or friend	111	43.7%
	Group of friends	57	22.4%
	Kids	63	24.8%

Continues on the next page

Socio-demographic char.	Category	Observations	Relative percentage
	Other	23	9.1%
Household	Partner	85	33.5%
	Kids	52	20.5%
	Friends	75	29.5%
	Other	42	16.5%
Living environment	(Middle) big city	164	64.6%
	Small city or village	90	35.4%

For the models examining socio-demographic characteristics, the socio-demographic categories have been transformed into effects coding. The coding scheme is showed in table 5.3.

Table 5.3: Coding socio-demographic characteristics

Socio-demographic characteristics	Levels	Effects coding		
Gender		Male	Female	
	Male	1	0	
	Female	0	1	
	Prefer not to say	-1	-1	
Age		18-30	31-50	51-64
	18-30	1	0	0
	31-50	0	1	0
	51-64	0	0	1
	65+	-1	-1	-1
Education		Low	Middle	High
	Low	1	0	0
	Middle	0	1	0
	High	0	0	1
	Other	-1	-1	-1
Work status		Students	Working (fulltime)	Working (parttime)
	Students	1	0	0
	Working (fulltime)	0	1	0
	Working (parttime)	0	0	1
	Other	-1	-1	-1
Income		Low	Middle	High
	Low	1	0	0
	Middle	0	1	0
	High	0	0	1
	Prefer not to say	-1	-1	-1
Travel company		Partner or friend	Group of friends	Kids
	Partner or friend	1	0	0
	Group of friends	0	1	0
	Kids	0	0	1
	Other	-1	-1	-1
Household		Partner	Kids	Friends
	Partner	1	0	0
	Kids	0	1	0
	Friends	0	0	1
	Other	-1	-1	-1
Living environment		(Middle) big city		
	(Middle) big city	1		
	Small city or village	-1		

5.4. Rating experiment

This section describes the statistics of the rating tasks in subsection 5.4.1 and shows how the levels of the rating experiment are coded in subsection 5.4.2.

5.4.1. Rating tasks

It is important to evaluate if the ratings provided in the rating experiment are nicely distributed over all rating values to obtain a comprehensive understanding of the relative importance of the different factors. An overview of the observed rating tasks is shown in Table 5.4 and the distribution is displayed in Figure 5.1.

The average rating of the attractiveness of a destination is 6.85 out of 10. The distribution shows that all rating values have at least 33 times been considered. It is interesting to know since this gives an indication of the appropriateness of the scale. However, since the attribute levels were chosen in such a way that most of the levels fell in the consideration set of people, it was expected that most destinations would be rated with a 5 or higher. Still, it makes sense that people, for example, who do not enjoy spending their holidays relaxing at the beach, would give a low rating to that destination.

Table 5.4: Rating tasks

Characteristic	Category	Observations	Relative
Rating	1	40	1.75%
	2	33	1.44%
	3	70	3.06%
	4	109	4.77%
	5	155	6.78%
	6	365	15.97%
	7	587	25.68%
	8	612	26.77%
	9	221	9.67%
	10	94	4.11%
	Total	2286	100%
	Average	6.846	

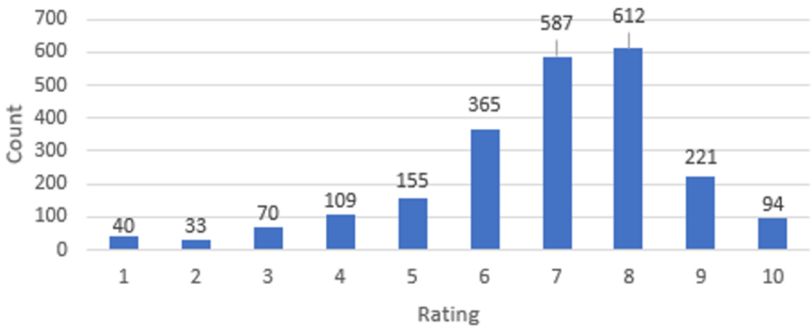

Figure 5.1: Rating tasks distribution

5.4.2. Coding

Since the attribute levels utilized in the rating experiment are ordinal and nominal, effects coding is applied to estimate the linear regression model, see table 5.5.

Table 5.5: Coding rating experiment

Attribute	Level	Effects coding	
Destination type		Active holiday	Relax holiday
	Active holiday: nature, mountains, parks, forsts	1	0
	Sightseeing holiday: city, culture, musea	0	1
	Relaxing holiday: sun, see, beach, pool	-1	-1
Weather expectations		Cloudy with sun	Rainy with sun
	Cloudy with sun	1	0
	Rainy with sun	0	1
	Sun	-1	-1
Temperature		18-24 degrees Celcius	24-30 degrees Celcius
	18-24 degrees Celcius	1	0
	24-30 degrees Celcius	0	1
	30-36 degrees Celcius	-1	-1
Familiarity		Familiar with destination, have visited	Unfamiliar with destination, also no friends have visited
	Familiar with destination, have visited	1	0
	Unfamiliar with destination, also no friend have visited	0	1
	Unfamiliar with destination, recommended by friends	-1	-1
Cultural differences compared to the Netherlands		Almost no cultural differences	Some cultural differences
	Almost no cultural differences	1	0
	Some cultural differences	0	1
	A lot of cultural differences	-1	-1

5.5. Choice experiment

This section describes the statistics of the choice tasks in subsection 5.5.1.

5.5.1. Choice tasks

In this subsection, the relative choices per choice task are discussed to identify any interesting observations. Figure 5.2 presents per choice task how many times the destinations were chosen relatively. It can be noted that in choice task 11 of both versions, choice task 10 of version *Choice experiment presenting all attributes* and choice task 1 of version *Choice experiment not presenting travel time and cost* alternative B was in favour for the majority of the respondents. When attentively examining these choice tasks, it appears that the choice is consistently made for the alternative with the highest attractiveness. For costs and distance, no clear pattern can be identified. This could be a first indication that high attractiveness heavily influences the choice of a holiday destination.

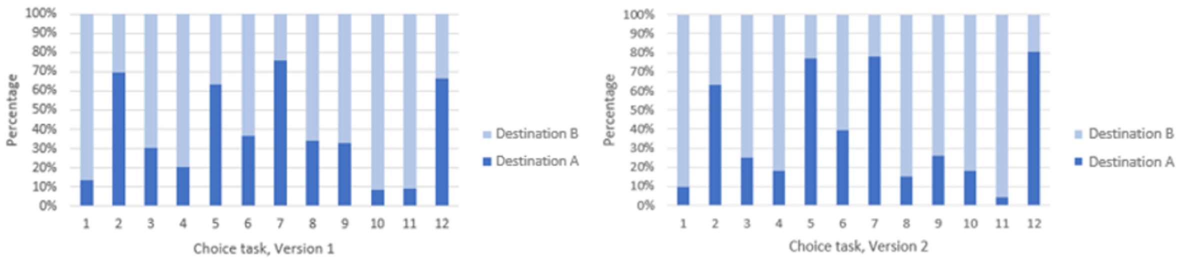

Figure 5.2: Choice tasks destination choices

6. Results

In this chapter, the results of the models are presented and analysed. Section 6.1 discusses the results obtained by the linear regression analysis. Next, the results of the MNL model and the LCCM are elaborated on in sections 6.2 and 6.3 subsequently. At last, the heterogeneity in preferences for the attractiveness of a destination in the rating experiment is studied per observed class 6.4.

6.1. Linear regression model results

Table 6.1 shows the results of the linear regression model per level attribute. The table presents the estimate effect, the standard error, the t-value and the p-value. The standard error is used to calculate the t-value. In many statistics studies, a t-value of |1.96| is used. Which means that the effects are statistically significant on a 95% confidence level. The effects that are written in black present the statistically significant effects (p < 0.05). The effects that are not statistically significant are presented in red. The ρ^2 and the adjusted ρ^2 presented at the bottom of the table present the explained variance of the model. It is a measure that indicates the model relative to the null model. Where 0 indicates that the model provides no improvement over a null model, and 1 indicates a perfect fit of the model. A higher adjusted ρ^2 means that the model variance is better explained which indicates a better model fit.

Table 6.1: Results linear regression model

N=254	Main effects			
Parameter	*Estimate effect*	*Std. Error*	*t-value*	*p-value*
Intercept	6.846	0.037	186.892	<0.001
Type: Active holiday	0.177	0.052	3.415	0.001
Type: Relaxing holiday	-0.286	0.052	-5.526	<0.001
Weather expectations: Clouds with sun	0.123	0.052	2.365	0.018
Weather expectations: Rain with sun	-0.458	0.052	-8.834	<0.001
Temperature: 18-24 C	-0.074	0.052	-1.433	0.152
Temperature: 24-30 C	0.282	0.052	5.447	<0.001
Familiarity: Visited	-0.077	0.052	-1.492	0.136
Familiarity: Not visited	0.048	0.052	0.920	0.358
Cultural difference: Almost no	-0.356	0.052	-6.874	<0.001
Cultural difference: Some	-0.011	0.052	-0.214	0.830
ρ^2	0.086			
Adj. ρ^2	0.082			

Destination attractiveness attributes

The intercept of the linear regression model is 6.8, meaning that on average, the holiday destinations have a rating of 6.8. The estimate effects are examined to check which of the variables contribute to explaining the destination attractiveness rating. The attributes are effects-coded, meaning that the sum of the values of an attribute needs to be zero. Table 6.2 presents the attributes including the reference level, coloured in grey (also visualised in Figure 6.1). In this table, the F-value per attribute is presented as well. The F-value is obtained by conducting an ANOVA analysis. The F-value indicates the ratio of explained variance to unexplained variance. A model with a higher F-value indicates that there is a larger unexplained variance. So, if a model with a missing attribute has a high F-value, it means that this attribute is important for the explained variance of the complete model. The attributes are sorted from high to low, based on their F-value.

Based on the F-values is concluded that weather expectation is the most influential attribute in this model. When excluding this attribute, a lot of information in the model is lost. Cultural difference is also found to be the next most important attribute. Followed by temperature and type of holiday. The figure also shows that familiarity is not an influential attribute. This might indicate that respondents did not really pay attention to being familiar with a destination or not.

Table 6.2: Destination attractiveness rating contribution, including reference levels

Attribute	**Attribute level**	**Estimate effect**
Weather expectations *(F-value: 41.8)*	Clouds with sun Rain with sun Sun	0.123 -0.458 0.335
Cultural difference *(F-value: 32.5)*	Almost no Some A lot	-0.345 -0.011 0.356
Temperature *(F-value: 15.9)*	18-24 C 24-30 C 30-36 C	-0.074 0.282 -0.208
Type *(F-value: 15.5)*	Active holiday Relax holiday Sightseeing	0.177 -0.286 0.111
Familiarity *(F-value: 1.3)*	Visited Not visited Not visited, but recommended by friends	-0.077 0.048 0.029

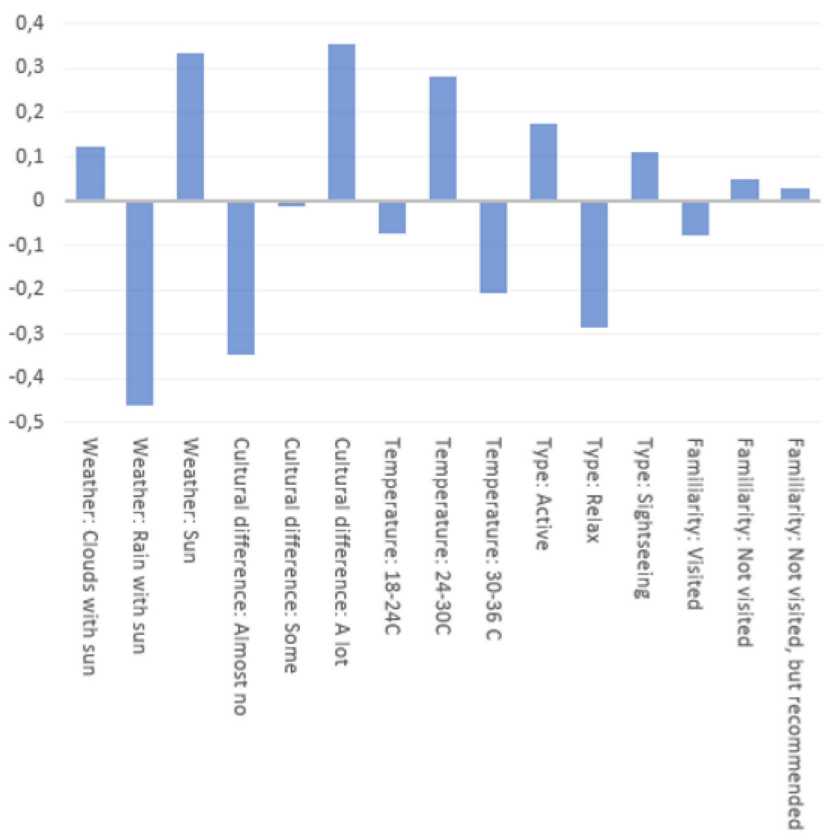

Figure 6.1: Linear regression plot

- **Weather expectation**
  The results show that for holidays where clouds with sun or just sun is expected, the attractiveness of a holiday destination is increased. Holiday destinations where rain with sun is expected, result in a negative contribution to the attractiveness rate of a holiday destination. As expected, the magnitude of the value for weather expectations with only sun is larger than with sun and clouds.

- **Cultural difference**
  Almost no cultural difference decreases the destination attractiveness rating of a holiday. While a lot of cultural distance increases the destination attractiveness rating. Some cultural difference has a very small influence and is not statistically significant. Therefore, it can be concluded that some cultural difference does not lead to any difference in the influence of destination attractiveness. It was expected that almost no cultural difference would only have a small negative value. However, it appears that this negative value is larger than expected. This finding is different than the suggestion of Vietze (2012), who found that tourists could also prefer destinations that have cultural similarities. The other papers discussed in the literature review did find a positive effect for cultural difference on holiday destination selection. This study however indicated that overall in this sample, there is a strong preference to have large cultural differences over almost no cultural differences for holiday destinations. In other words, the stronger the cultural difference, the better.

- **Temperature**
  Temperatures between 24-30 degrees Celsius appear to increase the destination attractiveness, whereas temperatures between 30-36 degrees Celsius decrease the attractiveness. Temperatures between 18-24 degrees Celsius have very little influence in the contribution to the attractiveness of holidays. Also, these temperatures are not statistically significant. Considering the small value and the non-statistically significance, the result shows that temperatures between 18-24 degrees Celsius have no effect on the attractiveness rating of a holiday destination. It was expected that temperatures between 30-36 degrees Celsius decrease the attractiveness of a holiday destination. This expectation is based on the study by Steiger et al. (2016), which revealed that temperatures exceeding 30 degrees Celsius are deemed unacceptable. The negative value observed for temperatures between 30-36 degrees Celsius is aligned with this finding.

- **Holiday Destination type**
  For holiday destination type, the results show that both an active and a sightseeing holiday increases the attractiveness of a destination. Where an active holiday increases the attractiveness even more than a sightseeing holiday. Meaning that these types of holidays contribute positively to how the holiday destination is rated. A relaxing holiday, however, decreases the holiday destination attractiveness. Overall, it can be concluded that people in this sample prefer active and sightseeing holidays over relaxing holidays.

- **Familiarity**
  It appears that the value of the influence of familiarity for all levels is very small and not statistically significant. Additionally, the F-value obtained through the ANOVA analysis is very small for familiarity compared to the other attributes. For these reasons, it is found that being familiar with a destination or not, does not appear to have an effect on the destination attractiveness. Nevertheless, the results do show that holiday destinations that have not been visited before are preferred over destinations that have been visited.

6.2. MNL model results

The first research question should be addressed by estimating the MNL models, which indicates how the distance to a holiday destination is traded off against the other characteristics of a trip to a holiday destination. Additionally, the second research question is elaborated on to investigate if there is a difference in the influence of distance on the choice of a holiday destination when travel time and cost are considered. In this section, the results of the MNL models are discussed. First, the model results of the version *Choice experiment presenting all attributes* are discussed. Followed by the results of the version *Choice experiment not presenting travel time and cost*. Then a comparison between the two versions is made.

MNL model, version 1: Choice experiment presenting all attributes
The results of the MNL model of the version *Choice experiment presenting all attributes* are shown in Table 6.3. The MNL model on the left shows the estimate effects where homogeneity is assumed and it is assumed that the estimate effects are linear. To test whether this linearity assumption is correct, the quadratic components are individually added to the MNL model. In both models, the estimate effect, the robust standard error, the robust t-ratio and the p-value are presented. The robust standard error and t-ratio are presented instead of the non-robust ones since this is a precautionary measure to enhance the accuracy of statistical inferences. The statistically significant effects are black and the effects that are not statistically significant are presented in red. Furthermore, the adjusted ρ^2, the final log likelihood and the BIC are presented. These measures give an indication of the model fit and the performance of the model. As explained in the previous section, a higher adjusted ρ^2 indicates a better model fit. The final log-likelihood shows how well the model explains the observed data. A log-likelihood closer to zero indicates a better model fit to the data. The BIC refers to the minimization of information loss. Models that have lower BIC values are generally considered to be more likely than models with higher BIC values. A commonly used guideline is that a BIC difference of more than 10 indicates that the more complex model is more likely (Paetz et al., 2019).

The MNL model on the left, assuming linearity, reveals that all attributes are statistically significant, except for the distance attribute. In the MNL model incorporating quadratic components (presented on the right), separate tests for each quadratic component are conducted. The changes in the estimate effects of the associated coefficients are presented, as well as the quadratic component, along with the final log-likelihood and BIC values for each tested quadratic component. None of the quadratic components in the model on the right are statistically significant. This suggests that the linearity assumptions are valid. Additionally, minimal changes in the final log-likelihood and BIC values indicate that continuing with the linear MNL model is appropriate. The beta's of the MNL model where linearity is assumed are further discussed.

Table 6.3: MNL model results, version 1: Choice experiment presenting all attributes

Version 1 (N=127)	**MNL**	No quadratic components			**MNL**	With quadratic components			LL (final)	BIC
Parameter	*Estimate*	*Rob. standard error*	*Rob. t-ratio*	*p-value*	*Estimate*	*Rob. standard error*	*Rob. t-ratio*	*p-value*		
$\beta\_distance$	0.003	0.017	0.170	0.433	-0.116	0.095	-1.215	0.112		
$\beta\_distanceQ$					0.011	0.008	1.272	0.102	-433.17	906.15
$\beta\_attractiveness$	1.243	0.125	9.909	<0.001	3.282	1.489	2.204	0.014		
$\beta\_attractivenessQ$					-0.145	0.107	-1.353	0.088	-432.96	905.73
$\beta\_traveltime$	-0.077	0.024	-3.226	<0.001	0.276	0.279	0.990	0.161		
$\beta\_traveltimeQ$					-0.014	0.011	-1.293	0.098	-433.39	906.59
$\beta\_travelcost$	-0.176	0.032	-5.523	<0.001	-0.209	0.120	-1.732	0.041		
$\beta\_travelcostQ$					0.003	0.010	0.283	0.388	-433.96	907.74
$\beta\_totalholidaycost$	-0.203	0.028	-7.382	<0.001	-0.174	0.062	-2.829	0.002		
$\beta\_totalholidaycostQ$					-0.001	0.002	-0.468	0.320	-433.89	907.59
Adj. ρ^2	0.169									
LL (final)	-433.99									
BIC	901.16									

*Distance is measured in 1000 kilometres, travel cost and total holiday cost are measured in 100 euros

An analysis is conducted to assess the relative importance of the attributes. The relative importance of an attribute denotes the degree to which the chosen attribute levels and range in this study impact the utility associated with each attribute. The calculation involved determining the utility range for each attribute and then dividing it by the total utility range across all attributes. Figure 6.2 presents the relative importance of the attributes in the MNL model. It shows that the total holiday cost has the largest impact on the utility in this MNL model. Attractiveness is also found to have a large impact on the utility. Travel cost comes in the third place of relative importance, followed by the travel time. It turns out that distance is relative to the other attributes, not important at all. This might indicate that people do not pay attention to distance, but the costs at the destination and the attractiveness of the destination are important factors determining the choice for a holiday. The difference in relative importance between travel cost and total holiday cost is not a surprise. As it was found in the literature that holiday costs occur to be more important than travel costs (Larsen & Guiver, 2013).

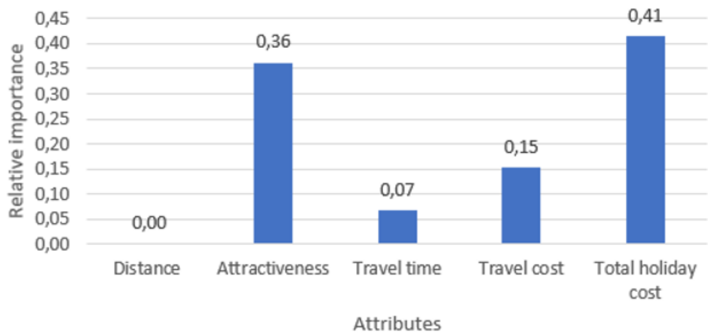

Figure 6.2: Relative importance of attributes, version 1: Choice experiment presenting all attributes

- **Distance**
  Table 6.3 shows that the beta estimate for distance has a positive value. However, this value is so small, that the influence of distance on the choice of a holiday destination can be negligible. This result is in contrast with what was expected. It was expected that when distance was detached from travel time and cost, that distance would have a positive influence on the choice of a holiday destination because more attractive destinations can be reached when the range of distance increases. A possible explanation for this contrasting result might be that given that weather expectations appear to be the most important attribute influencing destination appeal, distances of 2000 kilometres may already be perceived as sufficiently distant to reach desired holiday destinations. Nicolau and Más (2006) showed that tourists are ready to travel longer distances for a preferred climate. However, it is possible that this preferred climate is already within the range of 2000 kilometres, think of Spain, Portugal and the south of Italy, where good weather is almost guaranteed. This explanation is in line with Scott et al. (2010), who suggest that choosing holiday destinations closer to home would not diminish the holiday experience, as long as the destination fulfils the desired holiday expectations. Taking these findings into account, it can be concluded that if attractive holiday destinations can be found in different places, then distance does not have an effect on the choice of which holiday destination is ultimately chosen. This choice is probably determined by the travel time, costs and total holiday costs.

  Another contrasting observation regarding the negligible effect of distance is that it was found in the literature that destinations close to home may appear too familiar (Dinnie, 2007). Based on this information is was assumed that high cultural differences are associated with holiday destinations further away. In the sample of this study, almost no cultural differences have a negative influence on the attractiveness score of a holiday destination, while high cultural differences have a strong positive impact. This shows a preference for destinations with large cultural differences among the respondents in the sample. Since it was assumed that high cultural differences are associated with holiday destinations further away, this finding contrasts with the negligible effect of distance. Yet, no plausible explanation for this contrast has been identified.

- **Destination attractiveness**
  The beta for destination attractiveness has a very strong positive effect. Meaning that, as expected, a higher attractiveness score leads to a positive effect on choosing a holiday destination. It was also expected that when a holiday destination is seen as more attractive, people are willing to travel longer distances. When calculating how much people are willing to travel further for an increase in attractiveness of one rating score (Attractiveness of Distance (AoD)), it is found

that people are willing to travel only 414 thousand kilometres further (see equation, 6.1) for an increase of one attractiveness score. This surrealistic distance indicates that the attractiveness of a destination is not determined by distance and emphasizes the negligible influence of distance in the choice of a holiday destination. It's important to note that this study focuses on long distances, with the shortest distance considered being 2000 kilometres. As previously explained, this distance can possibly already encompass many desired holiday destinations. So when considering different distance ranges, the willingness to travel further distances for an increase or decrease in attractiveness might lead to other values.

$$AoD = \beta_{attractiveness}/\beta_{distance} \tag{6.1}$$

Attractiveness appears to be very important, while the influence of distance on destination choice is negligible. This could mean that people want to go to an attractive destination, regardless of the distance. This is consistent with what was concluded earlier. Therefore, to attract people to a closer destination, it is important that the attractiveness of that destination aligns with the desired holiday destination and should not be valued lower.

- **Travel time**
  The beta for travel time has the expected sign. The result shows that one hour decrease in travel time, leads to a small decrease in utility. In other words, longer travel times have a negative influence on the choice of a holiday destination.

- **Travel cost**
  The beta for travel cost also has the expected sign. The same explanation applies here as for travel time. The result indicates that when the travel costs are increased by 100 euros, the utility for choosing a holiday destination is decreased. In other words, an increase in travel costs has a negative influence on the choice of a holiday destination.

- **Total holiday cost**
  A similar explanation is true for the beta of total holiday cost, compared to the beta of travel cost. When the total holiday costs are increased by 100 euros, the utility for choosing a holiday destination is also decreased. This means that an increase in the total holiday costs leads to a negative influence on the choice of a holiday destination. It was expected that the total holiday cost would be considered more important than the travel cost, as this was found in the literature (Larsen & Guiver, 2013). The results show indeed that the total holiday cost has a bigger negative effect than the travel cost. This implies that the expected negative sign was accurate.

  Opting for countries with a lower cost of living compared to the Netherlands presents an opportunity to decrease the total holiday costs. Many Asian countries, for instance, have a lower cost of living. Consequently, travellers may choose for destinations in Asia, despite the higher travel costs involved. Alternatively, within Europe there are also countries with a lower cost of living compared to the Netherlands, think of Spain or Albania. Choosing such a European destination, instead of for example Swiss which has a high cost of living, could also contribute to reducing total holiday costs.

Overall, the results show that distance has no effect on the choice of a holiday destination; attractiveness has a great impact on this choice, where more attractive holidays are desired; and travel time, cost and total holiday cost are preferred to be reduced. Considering that distances further away increase travel time and cost, it could be concluded that if there are multiple attractive holiday destinations, choosing the holiday destinations most nearby, and with a relatively low cost of living, could increase the overall utility. So, to attract people to choose holiday destinations nearby, it is important that attractive holiday destinations are available within a certain distance range and that the travel time and all costs are reduced.

Value of Time

To validate if the MNL model presents realistic estimate effects, the Value of Time (VoT) is calculated. The VoT provides a deeper understanding of the trade-offs people make. The VoT expresses how negative the travel time is valued in a monetary unit (€ per hour). To calculate the VoT, equation 6.2 is calculated. In this formula, the travel cost is included instead of the total holiday cost. This was decided since travel cost reflects to the cost it takes for travelling a certain amount of time. Since it is concluded that the assumption that both attributes are linear is correct, the VoT can be calculated.

$$VoT = \beta_{traveltime} / (\beta_{travelcost} / 100) \tag{6.2}$$

To calculate the VoT, it is important to note that the travel costs were measured in 100 euros. Meaning that the beta for travel cost should be divided by 100 to find the Value of Time in the unit € per hour. The VoT found for this sample is estimated at €43.75 per hour. This means that people in this sample, on average, are willing to pay 43.75 euros for a decrease of one hour in travel time. This VoT is slightly lower than the VoT recently obtained by Knoope (2023), which was €54 per hour. This difference can be explained by the fact that the model of Knoope (2023) is based on a different sample and considers different attributes, which could result in different beta estimates.

In the sample in this study, the number of students is over-represented. Students most commonly have a low income and are therefore expected to have a lower willingness to pay for decreased travel time. 35 out of the 127 respondents in this version of the experiment are students (27.6%). 33 of these students appear to have a low income. This indicates that, for this sample, the assumption that students most commonly have a low income is correct. The MNL model was again estimated but this time only for students. It appears that the VoT for students in this sample is €7.14 per hour. This means that students are willing to pay only 7.14 euros for one hour reduction of travel time when travelling to their holiday destination. This value is much lower compared to the VoT of the sample average. This low value could be the reason that the VoT of the sample average is lower than the VoT observed by Knoope.

Now that it is known that the students have a very low VoT, it is interesting to understand why the average VoT of the sample still comes out to be €43.75 per hour. A potential group who might have a high VoT is the people with a high income (> €60.000 per year). This group is also over-represented in the sample population of this study. It is assumed that people with a high income have a higher willingness to pay for a reduction in travel time. 40 out of 127 respondents appear to have a high income (31.5%). This percentage is much higher than observed in the Dutch population, where it was found that 5.8% of the people have an income above 60.000 per year (CBS, 2023b). Even though the sample population in this study is 'Dutch tourists' instead of the total Dutch population, it can be assumed that the percentage of people with a high income is much larger in this study compared to the income of the 'Dutch tourists'. The VoT appears to be €73.71 per hour. So, people with a high income in this sample are willing to pay 73.71 euros for one hour reduction of travel time to their holiday destination. The beta estimates of the total sample of this version of the experiment, the students and people with high incomes are presented in Table 6.4.

Table 6.4: Value of Time

	Sample *Estimate*	**Students** *Estimate*	**High income** *Estimate*
$\beta\_distance$	0.003	0.035	-0.033
$\beta\_attractiveness$	1.243	1.018	1.879
$\beta\_traveltime$	-0.077	-0.016	-0.143
$\beta\_travelcost$	-0.176	-0.224	-0.194
$\beta\_totalholidaycost$	-0.203	-0.251	-0.226
VoT (€/hour)	43.75	7.41	73.71

So, based on these observations, it is found that students overall have a very small VoT, while people with a high income overall have quite a high VoT. It also explains the lower VoT of the sample average compared to Knoope (2023), and therefore this could indicate that the model in this study can be considered realistic.

MNL model, version 2: Choice experiment not presenting travel time and cost

Table 6.5 presents the results of the MNL model version *Choice experiment not presenting travel time and cost*. As previously explained, in this experiment, the travel time is excluded from the choice sets and travel cost was added up to the total holiday costs. In the initial model (presented on the left) where linearity is assumed, statistically significant beta estimates are observed for all attributes. To further assess the validity of this linearity assumption, quadratic components are again individually added. The resulting models illustrate adjustments in the estimate effects of the attributes along with the quadratic components, the final log-likelihood and BIC value for each model.

The MNL model with the quadratic components shows that the quadratic component for attractiveness is statistically significant. This would imply that the assumption of linearity is not valid in the linear MNL model. However, the final log-likelihood of the model where the quadratic component for attractiveness is included is only slightly better and the BIC value is even slightly worse. This indicates that the simpler model is more likely to be preferred over the more complex model including the quadratic components. The principle of Occar's razor is applied here which says: "If you have two competing ideas to explain the same phenomenon, you should prefer the simpler one" (New Scientist, n.d.). Therefore, it is decided that the linear MNL model is appropriate for further analysis and is further discussed.

Table 6.5: MNL model results, version 2: Choice experiment not presenting travel time and cost

Version 1 (N=127)	**MNL**	No quadratic components			**MNL**	**With quadratic components**			LL (final)	BIC
Parameter	*Estimate*	*Rob. standard error*	*Rob. t-ratio*	*p-value*	*Estimate*	*Rob. standard error*	*Rob. t-ratio*	*p-value*		
$\beta\_distance$	-0.073	0.025	-2.977	0.001	-0.104	0.094	-1.100	0.136		
$\beta\_distanceQ$					0.003	0.008	0.339	0.367	-399.6	825.74
$\beta\_attractiveness$	1.272	0.133	9.519	<0.001	4.635	1.352	3.428	<0.001		
$\beta\_attractivenessQ$					-0.241	0.098	-2.468	0.007	-397.06	820.66
$\beta\_totalholidaycost$	-0.19	0.029	-6.524	<0.001	-0.208	0.068	-3.067	0.001		
$\beta\_totalholidaycostQ$					<0.001	0.002	0.327	0.372	-399.61	825.76
Adj. ρ^2	0.259									
LL (final)	-399.65									
BIC	819.2									

Figure 6.3 presents the relative importance of the attributes in this MNL model. It shows that total holiday costs are by far the most important attribute. The attractiveness of a holiday destination also plays an important role. Distance however has a very small relative importance on the choice of a holiday destination. The utility range of total holiday costs is quite large because travel costs are added to the total holiday costs. This large utility range could be an explanation for the relatively high importance of this attribute.

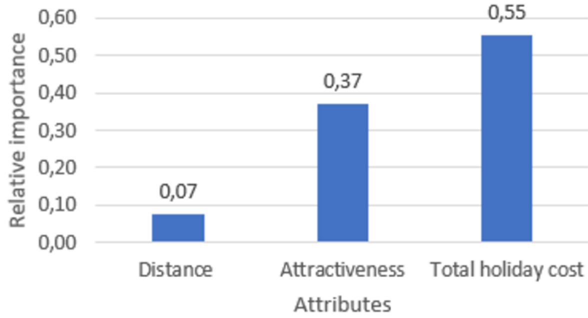

Figure 6.3: Relative importance of attributes, version 2: Choice experiment not presenting travel time and cost

The results presented in Table 6.5 show that when travel time and cost are not separately presented, the beta for distance is negative. Which indicates that shorter distances are preferred over longer distances in the choice of a holiday destination. This estimate effect is however still very small which again indicates that distance has a small effect on the choice of a holiday destination. The results of this experiment indicate that the choice of a holiday destination is mostly determined by the attractiveness of a holiday destination and by the total holiday costs. Since the underlying variables of travel time and travel costs are not isolated from distance in this experiment and therefore the value of distance is not controlled for travel time and cost, the AoD was not calculated. However, now that there is only one attribute regarding costs, it is interesting to calculate how much people are willing to pay for the total holiday costs for an increase of one rating score of attractiveness. This is determined by calculating the Value of Attractiveness (VoA), see equation 6.3. This calculation shows that people are willing to pay €669 for the total holiday costs for an increase of one rating score of attractiveness.

$$VoA = \beta_{Attractiveness}/(\beta_{totalholidaycost}/100) \tag{6.3}$$

Comparing version 1: Choice experiment presenting all attributes, and version 2: Choice experiment not presenting travel time and cost
In order to address the second sub-question concerning the change in the influence of distance on the choice of a holiday destination when travel time and cost are considered, versions 1 and 2 of the MNL model are compared. Firstly, it needs to be determined whether the versions can be compared without correcting the model with a scale factor. Version 1 contains more attributes; therefore, it's possible that the values of version 1 are systematically lower than those of version 2. A scale factor could correct this difference, allowing for a meaningful comparison of both versions if needed.

Figure 6.4 displays a plot of the different values of versions 1 and 2. The estimate effects for the attributes 'destination attractiveness' and 'total holiday costs' are nearly similar. It should be noted that in version 1, the total holiday costs are the cost excluded the travel cost. While in version 2, the travel costs are included in the total holiday cost. The travel cost in version 1 is lower than the total holiday cost in version 1. This might explain why the beta value of total holiday cost in version 2 is a little bit smaller. The sign of the estimate effect for distance is different. Since the change in the influence of distance is of interest for this sub-question, and the estimates for the other two attributes are almost similar, it can be assumed that the scale factor to compare versions 1 and 2 is not statistically significant. Therefore, the difference in the influence of distance on the choice of a holiday destination, when travel time and cost are considered, can be observed by comparing the outcomes of the MNL model for versions 1 and 2.

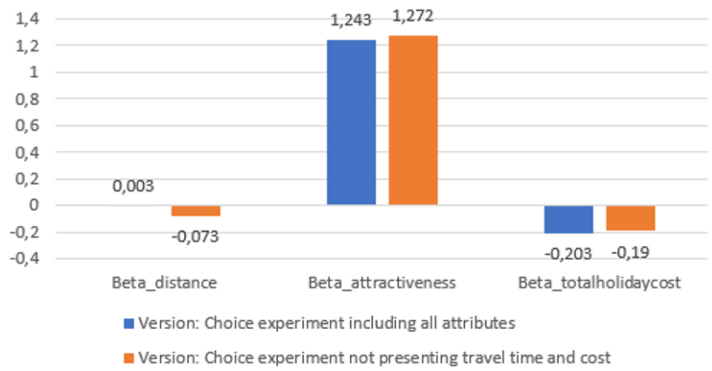

Figure 6.4: Comparing MNL estimates, version 1: Choice experiment presenting all attributes, and version 2: Choice experiment not presenting travel time and cost

When comparing the results of both versions of the experiment, it is observed that distance is not found to be an important factor when the travel time and cost are given. The other way around, it is observed that when travel time and cost are not explicitly given, distance becomes more important and has a negative effect. This aligns with what was found in the literature, that distance is often captured in travel time and costs, and both are not (explicitly) shown in the *Choice experiment not presenting travel time and cost*. The outcome meets the expectations, given that distance is intertwined with travel time and cost, which is preferred to be minimized. This implies that people have the perception that longer distances result in higher travel times and costs, and therefore the value of distance changes into a negative sign for distance when travel time and cost are not controlled for. These results show that there is indeed a change in the influence of distance on the choice of a holiday destination when travel time and cost are considered.

An explanation for the bigger magnitude of the value of distance and the difference in significance could be that version 1 includes fewer attributes than version 2. Consequently, people are compelled to place more emphasis on distance because fewer attributes are considered.

By comparing both experiments, it is concluded that distance in itself does not hold an intrinsic value in influencing the choice of a holiday destination and that the value of distance changes into a negative sign when travel time en cost are not controlled for. The choice of a holiday destination mostly is determined by a high attractiveness of a destination, where travel time, travel costs and total holiday costs are reduced. This implies, as earlier suggested, that the highest utility in selecting a holiday destination is achieved when an attractive option is available closer to home, when travel time and cost are reduced, and in a country with a lower cost of living, so the total holiday costs are reduced as well.

6.3. LCCM

The third research question asks to what extent preferences and choices for a holiday destination differ between people. This is addressed by estimating the LCCM. In the first section, the LCCM results are discussed (6.3.1). In the second section, the preferences observed per class are elaborated on (6.3.2). The last section explains the probabilities that respondents with certain socio-demographic characteristics belong to a specific class (6.3.3).

6.3.1. LCCM results

The MNL models discussed earlier operate under the assumption of homogeneity in preferences within the sample. However, it is plausible that distinct groups within the sample have different effects on the attributes considered in the choice sets. To address the third sub-question, which examines whether preferences for holiday destinations differ among individuals, the LCCM model is employed. This could investigate if there is heterogeneity in the sample.

For the LCCM model, more respondents are required than for the MNL model. (Nylund-Gibson & Choi, 2018) recommended to use of sample sizes of at least 300 respondents. However, smaller sample sizes might be sufficient when employing less complex models that involve fewer indicators and classes (Weller et al., 2020). In the survey of this study, half of the respondents (127 respondents) answered version 1: *Choice experiment presenting all attributes* of the choice experiment and the other half (127 respondents) answered version 2: *Choice experiment not presenting travel time and cost* of the choice experiment. To retrieve a sample size of 254 respondents, the stacked data of both versions is used to analyse the LCCM.

A problem arises for stacking the data because the version *Choice experiment presenting all attributes* contain the attributes distance, attractiveness, travel time, travel cost and total holiday cost. While version *Choice experiment not presenting travel time and cost* contain the attributes distance, attractiveness and total holiday costs, where travel cost was added up to the total holiday costs. To stack the data, two adjustments for the data in the version *Choice experiment presenting all attributes* were made. The travel time was deleted from the dataset and the travel time was added up to the total holiday costs. In this way, both experiments were similar to each other and could be stacked that created a dataset of 254 respondents with a choice experiment where distance is not separately presented from travel time and cost. The LCCM is now only based on 3 attributes, so a simpler model is required. Thus, a sample size of 254 respondents should be sufficient. It should be noted that it was allowed to stack the data since it was assumed that the scale factor to correct for versions 1 and 2 of the choice experiments is not statistically significant because the estimated difference for attractiveness and total holiday costs are so small.

The first step in the LCCM process is to determine how many classes should be included in the LCCM. This was done by estimating the model for a different number of classes and indicating which number of classes fits best. The statistical criteria of the different models are compared to decide the number of classes. The MNL model indicates that the respondents are all in 1 class and therefore are homogeneous. The statistical criteria that are compared are the adjusted R^2, the final log-likelihood and the BIC. Another aspect of deciding the number of classes is to consider the number of respondents in a class. Paetz et al. (2019) use a rule of thumb considering a minimum number of respondents of 30 per class. Table 6.6 presents the statistical criteria of the LCCM estimated with different numbers of classes.

Table 6.6: Number of classes LCCM

Classes	Adj. R^2	Log likelihood	BIC	Number of respondents in smallest class
1 (MNL)	0.195	-847.55	1717.09	254
2	0.208	-829.16	1709.62	112
3	0.229	-803.67	1687.97	47
4	0.235	-793.02	1695.97	12

As shown in the table, the LCCM is estimated with 2, 3 and 4 classes. The model that considers 4 classes has a higher BIC than the LCCM considering 3 classes. Also, the number of respondents in the smallest class is too low. For these reasons, the 4-class model scores worse than the other models. The model considering 3 classes has a better fit than the 2-class model according to the BIC. Even though it has a small amount of respondents in the smallest class, it is above the rule of thumb utilized by Paetz et al. (2019). Therefore, it is decided to study the 3-class LCCM further in this section.

Table 6.7 shows the results of the estimates of the LCCM with 3 classes. The class weight refers to the probability of belonging to one of the three classes without considering the socio-demographic characteristics. Figure 6.5 visualises the estimates per class in a graph. Figure 6.6 shows the relative importance of the attributes of the three classes.

Table 6.7: LCCM estimates

	Class 1: Most price-sensitive travellers			Class 2: Quality travellers			Class 3: Distance travellers		
Parameter	*Estimate*	*Rob. s. e.*	*Rob. t-ratio*	*Estimate*	*Rob. s. e.*	*Rob. t-ratio*	*Estimate*	*Rob. s. e.*	*Rob. t-ratio*
$\beta\_distance$	-0.113	0.066	-1.714	-0.135	0.107	-1.261	0.217	0.049	4.459
β_attr	1.138	0.259	4.394	2.434	0.473	5.114	0.809	0.300	2.694
$\beta\_totalholidaycost$	-0.295	0.053	-5.601	-0.222	0.053	-4.265	-0.143	0.072	-1.995
Class weight	35.8%			45.7%			18.5%		

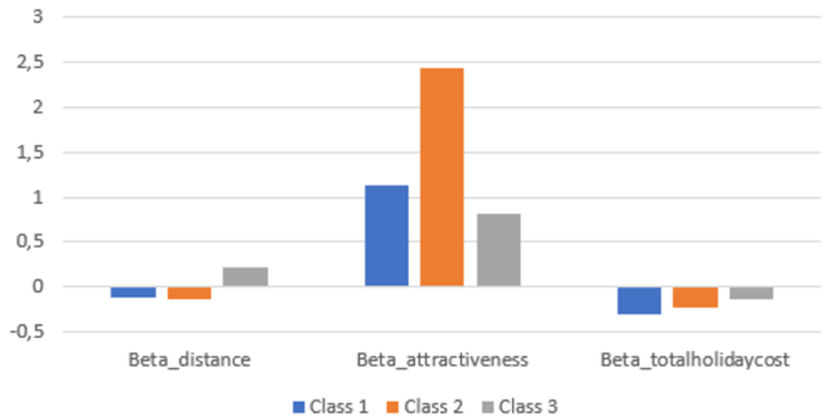

Figure 6.5: LCCM class estimates

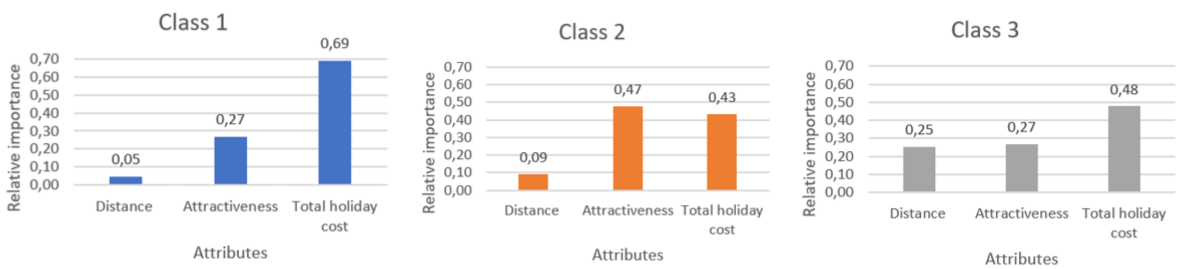

Figure 6.6: Relative importance of attributes of class 1, 2 and 3

In the table and the figures, the influence and the importance of the attributes of the classes are presented. Based on this information, the types of classes can be deduced. Note, that the beta weights of distance of classes 1 and 2 are not statistically significant. The results show that for class 1, the attribute total holiday cost has the strongest influence on the choice of a holiday destination compared to the other classes. Also, the relative importance of this attribute is very high. For this reason, the respondents in class 1 are identified as the *Most price-sensitive travellers*. For class 2, the attribute attractiveness has the strongest influence compared to the other classes. The relative importance of attractiveness is for this class also relatively high. Therefore, the respondents in this class are identified as *Quality travellers*. For class 3, the attribute distance has a positive effect, while in the other two classes, this effect is negative. The relative importance of the attribute distance is relatively high compared to this attribute in the other classes. Therefore, the respondents in this class are identified as *Distance travellers*. The probability that a respondent is a *Most price-sensitive travellers* is 35.8%, this probability for *Quality travellers* and *Distance travellers* is 45.7% and 18.5% respectively. The following subsection (6.3.2) delves deeper into the observed results of each class. Followed by an overview that presents the probabilities that indicate if a respondent belongs to class 1, 2, or 3 based on their socio-demographic characteristics 6.3.3.

6.3.2. Observations per class

This subsection describes the observations that differentiate each class from the other classes.

Class 1: Most price-sensitive travellers

The *Most price-sensitive travellers* have a negative beta for distance which means that *Most price-sensitive travellers* prefer shorter distances over longer distances. The relative importance of distance is however quite small. While the beta value for distance is not significant, it is plausible that with a larger sample size, this value could become statistically significant. The beta for attractiveness is, as expected, positive. The beta for total holiday cost is what differentiates the *Most price-sensitive travellers* from the other two classes since *Most price-sensitive travellers* have the strongest reaction to cost compared to the other two classes. This means that when the costs of the holiday increase, the utils of the *Most price-sensitive travellers* decrease the most. The VoA (see equation 6.3) is €386. Which means that people are willing to pay €386 for an increase in attractiveness. This willingness to pay for an increase in attractiveness for this class is the lowest compared to the other classes. The relative importance of the total holiday cost is also very high. From these results, it can be obtained that *Most price-sensitive travellers* find total holiday cost so important that they are willing to make concessions on the attractiveness of a destination. However, attractiveness still holds importance for them. Distance has a minimal influence on the choice of a holiday destination among respondents in this class.

Class 2: Quality travellers

For the *Quality travellers*, a similar explanation applies for the beta of distance as for the *Most price-sensitive travellers*; *Quality travellers* prefer shorter distances over longer distances, it should be noted that this result is not statistically significant either. For the beta of attractiveness, a large difference in magnitude of the estimate effect appears compared to the other two classes. The relative importance of attractiveness is the largest compared to the other attributes in this class and to the attractiveness attribute in the other classes. Meaning that the *Quality travellers* are most sensitive to the attractiveness of a holiday destination score. A higher attractiveness score results in a strong preference for a more attractive destination in the choice of a holiday destination for the *Quality travellers*. This differentiates the *Quality travellers* from the other two classes. The VoA for *Quality travellers* is €1096, and is found to the be the highest VoA compared to the other classes. It means that *Quality travellers* are willing to pay €1096 for an increase of attractiveness of the holiday destination. These results show that the respondents belonging to class 2, the *Quality travellers*, are most sensitive to an attractive holiday destination. Based on this analysis it can be concluded that they will probably choose the most attractive holiday destination, where they are willing to pay more for an increase of attractiveness and where distance has a minimal influence on this choice.

Class 3: Distance travellers

For the *Distance travellers*, a statistically significant beta for distance is shown. This beta estimate has a positive sign. This means that the preference for a holiday destination is increased for *Distance travellers* when the distance to a holiday destination is increased. Additionally, it is observed that the relative importance of distance is quite high compared to the other classes. This beta for distance differentiates the *Distance travellers* from the other two classes. The beta of attractiveness of a destination is found to have the least influence on the destination choice compared to the other two classes. The beta for total holiday cost for the *Distance travellers* also has the smallest value compared to the other two classes. A cheaper holiday is still preferred, however, the *Distance travellers* do not react heavily to a change in cost. The VoA for *Distance travellers* is €566. Indicating that they are willing to pay €566 more for an increase in attractiveness. From these findings, it can be obtained that *Distance travellers* are least sensitive to the attractiveness of a destination, but more sensitive to the distance of the destination. *Distance travellers* derive more utility from a destination further away than the other classes, even willing to compromise some of the attractiveness of the holiday destination. This indicates that the previous alignment with Scott et al. (2010) suggestion, which proposes that selecting a holiday destination closer to home would not diminish the holiday experience as long as the destination meets the desired holiday expectations, does not apply for the individuals classified as *Distance travellers*.

6.3.3. Class probability of socio-demographic characteristics

Besides inspecting the attribute beta's per class, it is also interesting to investigate the probabilities of the respondents belonging to each class based on their socio-demographic characteristics. This is done by estimating the class membership function in the 'nnet' package in R. The class membership function predicts the probability of an observation belonging to each class based on the socio-demographic predictor variables. Table 6.8 presents the probabilities of the different socio-demographic characteristics belonging to each class. These probabilities should be compared to the weight of the class which refers to the probability of belonging to one of the three classes without considering the socio-demographic characteristics. The difference in the probability of the socio-demographic predictor variables compared to the class weight indicates whether there is a higher or lower chance that a socio-demographic characteristic is frequently associated with this class. The sample average per socio-demographic characteristic is also presented because a very low percentage of a certain socio-demographic can result in irrelevant probabilities of the predictor variables. Therefore, the socio-demographic characteristics with a very low sample average are not further discussed for the different classes.

Table 6.8: Socio-demographic characteristics, class probabilities

		(100%)	**(35.8%)**	**(45.7%)**	**(18.5%)**
Socio-demographic characteristics	**Levels**	**Sample average (%)**	**Class 1 (%)**	**Class 2 (%)**	**Class 3 (%)**
Gender	Male	44.1	37.1	44.7	21.1
	Female	55.1	41.6	38.9	19.5
Age	18-30	48.8	43.0	35.3	21.7
	31-50	9.8	39.0	44.2	16.9
	51-64	37	33.7	48.9	17.4
	65+	4.3	50.6	40.9	8.5
Education	Low	1.6	53.3	1.9	44.8
	Middle	13.4	31.4	36.2	32.4
	High	84.3	40.4	43.1	16.5
Work status	Students	25.6	47.8	28.9	23.3
	Working (fulltime)	45.7	36.6	47.2	16.2
	Working (parttime)	17.3	38.2	38.2	23.5
	Other	11.4	34.3	51.5	14.2
Income	Low	36.2	46.4	33.2	20.4
	Middle	28.3	36.0	42.3	21.7
	High	29.9	32.5	51.8	15.7
Travel company	Partner or friend	43.7	40.8	41.0	18.3
	Group of friends	22.4	41.7	40.1	18.2
	Kids	24.8	43.4	23.5	33.1
	Other	9.1	34.4	42.5	23.1
Household	Partner	33.5	40.7	42.5	16.8
	Kids	20.6	30.9	53.4	15.6
	Friends	29.5	43.1	38.8	18.1
	Other	17.3	41.1	29.2	29.7
Living environment	(Middle) big city	64.4	42.3	37.8	19.9
	Small city or village	35.4	34.9	51.3	13.8

Characteristics of Class 1: Most price-sensitive travellers

The most interesting observations when analysing Table 6.8, are that there is a high probability that *Most price-sensitive travellers* are between 18-30 years old, are highly educated, with a high probability of being a student with a low income who most probably lives with friends or with a partner in a (middle) big city. These characteristics seem to sketch a logical picture since young adults most often have a low income because they are a student or maybe just started working. The probabilities of these characteristics belonging to the class *Most price-sensitive travellers* seem logical, as young adults with a low income have less to spend on holidays and therefore are more price-sensitive when it comes to choosing a holiday destination.

Characteristics of Class 2: Quality travellers

For the *Distance travellers*, it is observed that there is a relatively high probability that a *Distance travellers* is between 51-64 years old, has a high education, works fulltime, has a high probability of a high income and lives in a small city or village. It seems logical that someone with a high income has a strong preference for an attractive holiday destination where total holiday costs are seen as less important as they have more money to spend on holidays. Also, people who are older may prioritise attractive destinations and are probably willing to pay more to achieve this. The *Quality travellers* show a negative estimate effect for distance, while it was discovered by Nicolau (2008) that people with a higher income have a positive response towards distance. Which sounds logical, as longer distances also results in higher travel costs. An example for the differences in the results is that the study of Nicolau (2008) only included domestic tourism within Spain, so this research was conducted on smaller distance ranges. This leads to the assumption that the value of distance changes when smaller distance ranges are incorporated.

Characteristics of Class 3: Distance travellers

When analysing the *Distance travellers*, no clear pattern is observed at first sight. A relatively high percentage of people aged between 18-30 is observed as well as being a student or working parttime. It is also observed that there is a relatively high probability of having a middle income. Based on these observations it could be possible that the people in this class want to 'see the world' and therefore prefer travelling further distances before they settle and have kids. The high probability of travelling with kids seems however to be odd since it was found in the literature that people travelling with children prefer shorter destinations. It is also strange since the probability of living with kids is relatively small. Despite these observations, no clear pattern for the characteristics of *Distance travellers* is found.

6.4. Preferences of the attractiveness of a destination per class

Now that more insights are gained into how distinct classes respond to distance, the attractiveness of a holiday destination and the total holiday costs, and the types of individuals associated with each class are identified, it becomes interesting to explore the preferences of the characteristics of a holiday for each class. So, in this section, it is analysed how respondents in each class perceive the characteristics of the attractiveness of a holiday destination given in the rating experiment.

It became clear that for the sample where homogeneous respondents is assumed, shorter distances are preferred over longer distances in version 2: *Choice experiment not presenting travel time and cost* of the choice experiment. Nevertheless, the LCCM reveals heterogeneity within the sample, indicating that the effect of distance varies across different classes. *Most price-sensitive travellers* and *Quality travellers* have a negative effect towards distance. *Distance travellers* however have a preference for longer distances over shorter distances for holiday destinations. For the two classes where distance seems to be irrelevant or even has a negative impact, it is interesting to explore the types of holidays these people prefer. By doing so, it allows to assess if such holidays can be realized closer to home and if they can be promoted more effectively. This way, these respondents can be encouraged to book the types of holidays they are looking for closer to home. Which in the end could lead to a reduction of flown kilometres. For the *Distance travellers*, who value distance positively, it would be challenging to persuade them to opt for holidays closer to home, as they derive utility from destinations further away. The results showed that they are even willing to compromise some attractiveness of the holiday destination for one that is farther away. However, it is still interesting to investigate the types of holidays they desire. Aiming to gain a better understanding of how distant holidays can be discouraged or if the same types of holidays can also be realised closer to home.

To understand how the class membership probabilities are associated with the preferences of the attractiveness of a destination, the previously used regression model is extended. The class membership probabilities are added, both additive (on top of the constant) and integral (in interaction with the explanatory variables), to the model. These estimate effects show the preferences of the probabilities of the respondents within each class for the different attribute levels included in the rating experiment. Table 6.9 presents the estimate effects for each class. The results are also visualised in Figure 6.7.

Table 6.9: Compare classes on linear regression model

	Class 1: Most price-sensitive travellers (35.8%)	**Class 2: Quality travellers (45.7%)**	**Class 3: Distance travellers (18.5%)**
Parameter	*Estimate effect*	*Estimate effect*	*Estimate effect*
Intercept	6.854	6.794	6.930
Type: Active	0.284	0.266	-0.194
Type: Relax	-0.325	-0.441	0.094
Type: Sightseeing	0.042	0.174	0.099
Weather expectations: Clouds with sun	0.061	0.068	0.349
Weather expectations: Rain with sun	-0.346	-0.505	-0.605
Weather expectations: Sun	0.285	0.438	0.255
Temperature: 18-24 C	-0.099	-0.050	-0.092
Temperature: 24-30 C	0.337	0.310	0.025
Temperature: 30-36 C	-0.239	-0.259	0.068
Familiarity: Visited	-0.022	-0.145	-0.068
Familiarity: Not visited	-0.088	0.242	-0.108
Familiarity: Not visited, but recommended	0.111	-0.098	0.176
Cultural difference: Almost no	-0.346	-0.292	-0.564
Cultural difference: Some	0.046	-0.020	-0.111
Cultural difference: A lot	0.299	0.311	0.676

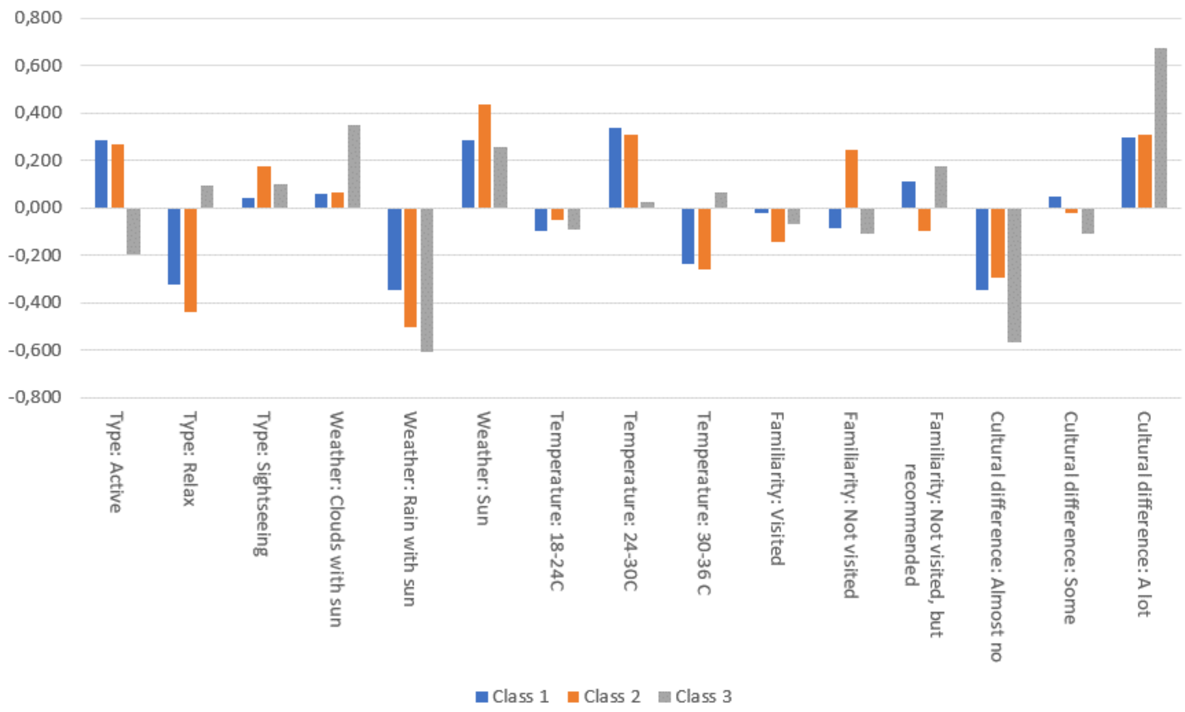

Figure 6.7: Compare classes on linear regression model

Holiday preferences of Most price-sensitive travellers

Based on the results it can be concluded that *Most price-sensitive travellers* have a preference for active holidays and do not prefer relaxing holidays. Given the high likelihood of individuals in this class being between 18 and 30 years old, suggesting youth and probable fitness, this result is reasonably understandable. Holiday destinations where sun is expected are preferred, and destinations where sun with rain is expected should be avoided. Furthermore, they favour temperatures between 24-30 degrees Celsius are in favor and they dislike higher temperatures. At last, *Most price-sensitive travellers* find destinations with a lot of cultural differences more attractive.

Overall, when taking these findings into account it seems feasible to encourage *Most price-sensitive travellers* to book holidays closer to home. The availability to have an active holiday at a destination where sun is expected with temperatures between 24-30 degrees Celsius can certainly be found within Europe. The *Most price-sensitive travellers* also show a preference for large cultural differences. Based on the strong preference for large cultural differences observed in class 3, coupled with their preference for longer distances, makes the assumption that larger cultural differences are associated with greater distances even more plausible. However, cultural differences exist within Europe as well, even though they may not be very large. It is possible that people do not associate cultural differences with European countries. By promoting awareness of these cultural distinctions for holidays, a shift in this association may be provoked.

Apart from the availability of the favoured holiday destinations within Europe, travel costs to destinations closer to home are most often lower. Offering good deals for preferred holiday destinations in combination with lower travel costs could probably encourage people in this class to book holidays closer to home.

Holiday preferences of Quality travellers

Quality travellers have similar outcomes for the attractiveness of a holiday destination as *Most price-sensitive travellers*. *Quality travellers* however also have a small preference for sightseeing holidays apart from their preference for active holidays. Furthermore, they also favour countries they have not visited before.

Since *Quality travellers* have similar outcomes as *Most price-sensitive travellers*, comparable holiday destinations could be promoted to encourage *Quality travellers* to book a holiday closer to home. However, this class reacts most sensitively to attractive holiday destinations and is less price-sensitive. So, for these people, more luxury holidays can be promoted which probably increases the attractiveness but consequently costs more money.

Holiday preferences of Distance travellers

Distance travellers are a little indifferent in the type of holiday they prefer. A small positive effect is seen in relaxing and sightseeing holidays and a negative effect is seen in active holidays. They prefer holidays with sun with clouds or just sun and are indifferent to the temperature. The strongest influence on the attractiveness of a holiday destination for *Distance travellers* is the strong preference for countries with a lot of cultural differences compared to the Netherlands.

Since *Distance travellers* have a preferences for destinations further, are less price-sensitive and are found to compromise on the attractiveness of a destination, it is hard to encourage the people in this class to book holidays closer to home. The strong preference for a large cultural difference and the assumption that cultural differences are associated with further distances as previously explained, makes it also hard to encourage the people in this class to book holidays closer to home. Putting more emphasize on the cultural differences within Europe for holidays may work for some people, but ultimately the people in this class are the hardest to influence to choose holiday destinations closer to home.

7. Conclusions and Discussion

Tourism that travels by airplane for holiday reasons is responsible for the majority of CO2 emissions within the tourism transport sector. The number of flights covering longer distances is increasing and implies more energy consumption and therefore has a greater environmental impact than shorter distances. Although people are expected to continue with travelling, adjusting their destinations and modes of transport can mitigate the environmental impact of tourism transport while still allowing for enjoyable travel experiences. Choosing destinations closer to home should be considered to minimize CO2 emissions. This research focused on how people value distance when choosing the destination for their holiday in order to gain a more comprehensive understanding of tourism travel behaviour. The main research question examined in this study is: *'What is the value of physical distance for Dutch tourists in the choice of their summer holiday destination?'* To address the main research question, three sub-questions were formulated to provide a comprehensive understanding of how people value distance. In this discussion the findings of each sub-question are synthesized to draw insights and implications for the overall research question.

To examine the research questions, a survey based on stated preferences was conducted. This survey included a rating experiment to estimate the importance of different attributes that influence the attractiveness of a destination, and a choice experiment to estimate the preferences of different attributes regarding the trip characteristics to a destination including the attractiveness score of that destination. Data from 254 respondents was collected. The models used to analyse the data and answer the research question are a Linear Regression model, a Multinomial Logit model and a Latent Class Choice Model.

7.1. Key findings

Distance is often valued in travel time and travel costs, which people commonly seek to minimize. However, with increasing the range of distance for a holiday destination, more attractive holiday destinations can be reached. The aim of this research was to explore the intrinsic value of distance in the choice of a holiday destination. It was expected that when controlling for travel time and costs, that destinations further away are preferred over destinations closer to home. This was examined by conducting two versions of the choice experiment. The first version: *Choice experiment presenting all attributes* included the attributes distance, attractiveness, travel time, travel cost and total holiday cost. This data enables analysing the intrinsic value of distance by separating distance from travel time and costs and is analysed to address the first sub-question. This question asks how travellers assess the distance to a holiday destination concerning the characteristics of the trip to that destination. Based on the results, it is concluded that distance has a very small positive value. This value is so small that it has a negligible influence on the choice of a holiday destination. It was however unexpected that the value for distance would be negligible since it was expected that destinations further away would have a positive value, instead of such a small positive value that it can be negligible, as more attractive destinations could be reached with an increased distance. This result suggests that the value of distance is caused by other attributes that correlate with distance, but that the intrinsic value for distance is very limited.

The attractiveness of a holiday destination appears to be an important factor influencing the choice of a holiday destination. Meaning that people are sensitive to an attractive destination. Besides attractiveness, it is shown that total holiday costs also have an important influence on the choice of a holiday destination, as well as the travel cost and the travel time. These three attributes are, as expected, preferred to be minimized. This suggests that if multiple attractive holiday destinations can be found at different places, then distance does not have an effect on the choice of which holiday destination is ultimately chosen. The choice of this attractive holiday destination is probably determined by minimizing the total holiday costs, the travel costs and travel time.

The different attributes regarding the attractiveness of a holiday destination were studied by conducting a rating experiment in the survey, and is analysed by a linear regression model. This analysis showed that the most important factors influencing the attractiveness of a destination are weather expectations and cultural differences, followed by temperature and the type of holiday. It appeared that familiarity does not contribute to the attractiveness of a holiday destination. Active holiday destinations where sun is expected with temperatures between 24-30 degrees Celsius, with high cultural differences contribute most to an attractive holiday destination. The preference for high cultural differences in combination with the negligible effect of distance does not seem entirely logical since high cultural differences were assumed to be associated with larger distances. No explanation is found for this contrasting result.

The high importance of an attractive holiday destination leads to another explanation of the unexpected negligible value for distance beside the probability that the choice of a holiday destination is determined by minimizing the total holiday costs, the travel costs and travel time. The shortest distance included in the choice experiment was 2000 kilometres. Within 2000 kilometres, there are already many holiday destinations where sun and good temperatures are almost guaranteed, think of Spain, Portugal and the south of Italy. These factors are found to be important for the attractiveness of a holiday destination. It is possible that distances of 2000 kilometres are already considered sufficiently distant to reach desired holiday destinations. This is further elaborated on in the future research section (7.4).

A second version of the choice experiment was conducted to answer the second sub-question, asking if the influence of distance on the choice of a holiday destination changes when travel time and cost are considered. This version, called: *Choice experiment not presenting travel time and cost* included the attributes distance, attractiveness and total holiday cost where travel costs are added to the total holiday costs. The results show that in this version, where travel time is excluded and travel cost is not separately presented to the respondents, distance has a larger negative influence. The attributes attractiveness and total holiday cost have a similar sign compared to the other version and are almost similar in magnitude. Therefore, it can be concluded that the value of distance changes for the choice of the choice for a holiday destination when travel time and cost are considered. The negative sign of distance can be explained by the perception that distance is captured in travel time and costs. Since travel time and costs are not separately presented in this choice experiment, respondents associate distance with travel time and costs which is preferred to be minimized, resulting in a negative sign for distance.

In the first two sub-questions, a homogeneous sample was assumed. The third sub-question asks to what extent the preferences and choices of a holiday destination differ between people. To indicate the heterogeneity within the sample, the Latent Class Choice Model was estimated. This model obtained three different classes: *Most price-sensitive travellers*, *Quality travellers* and *Distance travellers*, which have class weights of 35.8%, 45.8% and 18.5% subsequently. It is shown that for *Most price-sensitive travellers* and *Quality travellers*, the effect of distance is negative, while this effect is positive for *Distance travellers*. For further implications discussed in section 7.2, it is also interesting to understand what types of holidays the different classes prefer. Therefore, the attractiveness preferences of a destination of the probabilities of the respondents within each class are estimated using the linear regression model.

Most price-sensitive travellers
The results showed that *Most price-sensitive travellers* are sensitive to the total holiday costs and have the lowest willingness to pay for an increase in the attractiveness of a holiday destination. This suggests that *Most price-sensitive travellers* prioritise a reduction of total holiday costs and are probably willing to compromise on the attractiveness of the holiday destination. Nevertheless, attractiveness still plays an influential role in the choice of a holiday destination. Distance is valued negatively, however, it appeared that distance only has a minimal influence on the choice of a holiday destination. This class is characterised by people between 18-30 years old who have a high probability of being a student, are highly educated and have a low income. The holidays they mostly prefer are active holidays with high cultural differences, where sun is expected with temperatures between 24-30 degrees Celsius.

Quality travellers

Based on the results, it is concluded that *Quality travellers* react very sensitively to an attractive holiday destination where they are willing to pay more to achieve a more attractive holiday destination. Similar to the *Most price-sensitive travellers*, it appears that distance only has a minimal effect on the choice of a holiday destination. *Quality travellers* are characterised by people between 51-64 years old, that are highly educated, work fulltime and have a high income. The holidays they mostly prefer are active or sightseeing holidays with high cultural differences, where sun is expected with temperatures between 24-30 degrees Celsius.

Distance travellers

Distance travellers appear to be the only class to value distance positively. The relative importance of distance is also quite high. The attractiveness and total holiday costs have less influence on the choice of a destination compared to the other two classes. *Distance travellers* find greater utility in holiday destinations further away, even willing to make concessions on the attractiveness of holiday destinations. There is no clear pattern indicating the characteristics of *Distance travellers*. However, It is most probable that someone belonging to this class is between 18-30 years old with a middle income. *Distance travellers* have a very strong preference for holidays with large cultural differences and prefer relaxing and sightseeing holidays over active holidays.

When addressing the main research question, it is concluded that in a homogeneous sample population, where travel time and cost are taken into consideration, there is no significant influence of distance for Dutch tourists in the choice of their summer holiday. While, it was expected that further distances were preferred over shorter distances. However, when travel time is not included and travel cost is not shown as a separate attribute to take into account, a small negative influence appears for the influence of distance. The results also showed that there is heterogeneity within the sample regarding how people value distance. The majority of the sample, which are the *Most price-sensitive travellers* and the *Quality travellers*, value distance negatively. This suggests an opportunity to encourage these people to book holiday destinations closer to home, potentially reducing travel distances. This is further elaborated on in the implications (7.2).

7.2. Implications

The reason behind investigating the intrinsic value of distance was to gain insights into opportunities and potential of reducing the number of long-distance flights for holiday reasons and thereby reducing CO2 emissions. In this study, it was researched if distance in itself has any influence on travel behaviour when controlling for travel time and cost. This knowledge offers more insights into the research field of tourism travel behaviour and provides information for policymakers at the Ministry of Infrastructure and Water Management. This section delves into the implications arising from the results obtained in this research.

Distance appears to have no intrinsic value when controlling for travel time and travel costs, yet the number of long-distance flights for holiday travel is increasing, as previously explained. Distance may have no direct impact on the influence on the choice of a holiday destination, but the attractiveness of the destination and the total holiday costs turn out to be very important factors influencing the destination choice, followed by travel cost and travel time.

An explanation why individuals may still choose destinations further away could be attributed to the desire for variety-seeking behaviour. Perhaps they have already explored numerous nearby destinations and are now seeking new experiences by travelling longer distances. If this is the reason to choose further holiday destinations, it would be difficult to encourage these people to keep on booking holiday destinations closer to home. However, to examine this assumption, further research is needed, as is mentioned in the future research section (7.4).

Another explanation for the increase in the number of long-distance flights for holidays could be that the strong positive effect of attractiveness might outweigh the negative effect of travel time and cost. Given that there is no intrinsic value in distance and larger distances increase the travel time and cost, it is suggested that when multiple attractive holiday destinations are available, choosing the holiday destination most nearby with reduced travel time and costs, increases the overall utility. This opens the opportunity to explore possibilities for increasing the number of holidays closer to home, thereby reducing CO2 emissions.

Most attractive holiday destinations in the homogeneous sample are found to be holidays where sun is expected with large cultural differences, the temperature should be between 24-30 degrees Celsius and different activities should be available. Taking into account that total holiday costs and attractiveness are of high importance for the choice of a holiday destination, good deals should be offered on the preferred types of holidays to encourage people to book holidays closer to home. Moreover, attractive holiday destinations closer to home have a higher chance of being chosen if the travel time and costs are reduced. This can potentially be achieved by ensuring the accessibility of a wide variety of attractive holiday destinations within Europe, which results in lower travel times. However, the accessibility within Europe to reach many holiday destinations is already quite good, so it seems there may not be much to be gained in this regard. Given that there are different classes observed within this sample, it is also interesting to delve into the existing possibilities for encouraging people to opt for destinations closer to home within the different observed classes. This approach allows for a more specific examination of how different groups of people can be influenced in their choice of a holiday destination.

The three different observed classes, discussed in the key findings section (7.1), showed that the *Most price-sensitive travellers* and *Quality travellers* both show a negative effect towards distance, while *Distance travellers* show a positive effect towards distance as well as a relatively high importance for distance. The combined class weight of the *Most price-sensitive travellers*, *Quality travellers* is 81.6% which indicates that distance is not an influential factor, or even has a negative influence on the choice of a holiday destination for the majority of the people in this sample. Given that long distances for a holiday are the least appealing to the people belonging to these classes, focusing on inducing a shift in people's choices to encourage them to opt for holiday destinations closer to home would hold the most potential here.

Given that low costs are most important for *Most price-sensitive travellers*, providing good deals is crucial. The holidays that people in this class find attractive include destinations where sun is expected with temperatures between 24-30 degrees Celsius which can certainly be found within Europe. Another important attribute to increase the attractiveness of a holiday destination for *Most price-sensitive travellers* is high cultural differences. Even though the cultural differences within Europe are not very large, still significant cultural differences can be found. Promoting the cultural differences found in countries within Europe can contribute to the attractiveness of the holiday destination. The willingness to pay for an increase in attractiveness is for this class lowest compared to the other classes. So, offering good deals for preferred holiday destinations closer to home, with lower travel costs, could encourage the people in this class to book holidays closer to home.

Quality travellers, however, have a higher willingness to pay for an increase in attractiveness as they consider the attractiveness of a destination most important. The type of holidays they find attractive are similar to the *Most price-sensitive travellers*, but they also have a small preference for sightseeing holidays. *Quality travellers* have the highest willingness to pay for a more attractive holiday destination and the choice of a holiday destination is mostly influenced by an attractive holiday destination. Therefore, emphasising on the attractiveness of a holiday for destinations closer to the Netherlands may encourage *Quality travellers* to book these holidays, as they are even willing to pay more to achieve this. Hence, more luxurious holidays can be promoted improving the attractiveness.

Since, *Distance travellers* show a positive and relatively important effect of distance, persuading them to opt for holidays closer to home might be challenging. They derive utility from larger distances to a holiday destination and are even willing to compromise on the attractiveness of a holiday destination. Still, it remains interesting to consider the preferences for holiday types among these individuals to enhance our understanding of whether distant holidays can be discouraged or if comparable holiday experiences can be offered closer to home.

It was found that *Distance travellers* have a strong preference for large cultural differences. So, even though inducing a shift in choosing destinations closer to home is challenging for the people in this class, highlighting the cultural differences within Europe may enhance the appeal of European destinations.

In addition to promoting attractive holidays, costs appear to be an important factor across all of the choice experiments, whether within a homogeneous sample or among different classes. People seem to be sensitive to price, some more than others as discussed for the *Most price-sensitive travellers* and *Quality travellers*. Therefore, aside from providing tailored holiday deals to target specific classes, raising the prices for long-distance flights results in higher total holiday costs and potentially diminishes the appeal of long-distance travel, even among the *Distance travellers*.

7.3. Limitations

It is important to note that this study contains some limitations which could influence the results. First of all, there was no budget and limited time was available for data collection by means of an online survey. For this reason, it was challenging to gather data from respondents representing the Dutch tourist population. Additionally, the sample population is not generalizable because the online survey was distributed through the author's network, resulting in a sample with higher concentrations of individuals of similar ages and thereby potentially sharing relatable socio-demographic characteristics. Also, a larger number of respondents could have led to more statistically significant results, which could generalise the outcomes to the population with more certainty. Nevertheless, interesting insights were gained among different types of people.

Another disadvantage of stated preference studies is that the preferences provided by the respondents are based on hypothetical scenarios. So their stated preferences may be different from their actual behaviour, since respondents are not directly impacted by the outcomes of their decisions. This could result in variations in the estimated effects. For instance, individuals might have struggled to imagine the impact of travel time in these choice experiments. They could have underestimated its importance in the hypothetical scenario compared to real-life experiences, potentially resulting in underestimated effects in these estimations. This bias was tried to be reduced by creating choice options that were reasonable and imaginary.

Furthermore, a limitation arises from the use of the D-efficient design to prevent dominance in the choice sets. The selection of priors was based on existing literature and proportional estimation of parameters. While the direction of estimate effects for attributes attractiveness, travel time, travel cost, and total holiday cost aligned with expectations, the actual magnitudes differed from the priors. Specifically, the relatively small estimate effects observed for travel time, travel cost, and total holiday cost suggest that their influences may be weaker than initially assumed. Conversely, the larger magnitude of the estimate effect for attractiveness implies a potentially stronger influence than anticipated. For the prior for distance, it was expected that larger distances would be preferred over shorter distances. Based on the results, it can be concluded that this was not correct. However, since there was uncertainty about the prior for distance, only a very small magnitude was chosen. Due to a limited time span, the priors have not been tested in the pilot test. Testing the priors may have led to different prior parameter information. Despite these limitations, the general trends and patterns captured by the study are likely to reflect real-world behaviours, even if the specific magnitudes and directions of estimate effects deviate from initial expectations. Therefore, while the uncertainty in priors introduces a limitation, the overall validity and reliability of the study's findings are unlikely to be substantially compromised.

Moreover, when the two versions of the choice experiments were compared, it was assumed that since the differences between the two versions for attractiveness and cost were so small, a scale factor would not have been statistically significant. This is a limitation of the results and should be tested to ensure that this assumption is correct.

At last, to maximize the number of respondents for the LCCM model, the data from the two versions of the choice experiments were pooled. To do this, the data of the version including travel time had to be adjusted. The travel time was excluded from the data set and the travel cost and the total holiday cost were summed. There is a risk that the respondents of the version including travel time would have made different choices when travel time and cost were not presented. This decision to adjust the data was made because the results of the parameters were very similar and therefore comparable. For this reason, it was assumed that this risk is limited.

7.4. Future research

The average distance of kilometres per flight is rising for tourists, while this research found that the majority of the respondents show a negative effect towards distance. This can be explained by the finding that the strong positive effect on the attractiveness of a holiday destination might outweigh the negative effect of distance. These insights lead to interesting new research opportunities. This study solely examined the types of holidays people find attractive and suggested that promoting such holidays might influence behavioural changes in destination choices. Further research into why people still opt for destinations farther away could provide more insights into how to encourage or persuade individuals to choose flights closer to home. This can be done by conducting in-depth interviews with travellers who choose for long-distance destinations to understand their motivations, preferences, and decision-making process. Factors such as personal preferences, travel experience, and attitudes towards environmental impact could be explored.

Variety-seeking behaviour could also be a reason why individuals may still choose destinations farther away as previously explained. To explore if this assumption is correct, a survey on studying people's attitudes towards variety-seeking behaviour and by exploring people's travel experiences could be conducted. This could enhance the understanding of the motives behind choosing holiday destinations.

Furthermore, it is interesting to investigate whether status also influences the choice of a distant holiday destination. Some individuals might perceive travelling to far-off places as more prestigious. However, this might be challenging to explore as individuals may be reluctant to admit that status plays a role in their decision-making process. Researchers could consider experimental methods, such as presenting participants with hypothetical scenarios or choice tasks that vary in terms of distance and perceived status, to better understand the influence of status on destination preferences.

This research did not take into account people's environmental considerations. It might be interesting to investigate how the awareness of the environmental impact of flying could influence behaviour. For example, this could be explored by including emissions per flight in a choice experiment. It is already seen that some people no longer fly for holiday reasons. This is encouraged by the concept of 'flight shame'. The number of people choosing not to fly for holidays for environmental reasons is still very small, and flying for holidays is still widely accepted. Perhaps people find it too big a step to stop flying for holidays, while they may be willing to make concessions on the distance for their destinations. This can be studied by means of conducting interviews with individuals who have experienced or expressed flight shame to explore their motivations, feelings, and decision-making processes regarding travelling, including any considerations or changes they have made due to environmental concerns. Perhaps an increased awareness of the emissions from long-distance flights, combined with a new perspective on flying, could change the perception of long-distance flights for holidays. People might start considering it socially irresponsible, leading to fewer choices of distant destinations in the future.

Moreover, regarding studying the preferences of holidays, it is interesting to adopt interaction effects in the linear regression model. This allows to examine if the relationship between two variables changes depending on the value of a third variable. They indicate whether the effect of one variable on the dependent variable depends on the value of another variable. This reveals more complex relationships between variables than with a simple main effect model. For example, if interaction effects are included, it can be estimated if the type of holiday and weather expectations interact with each other. This interaction effect could tell whether the impact of weather expectations on the attractiveness of a destination differs based on the type of holiday. In this way, more insights can be provided on how holiday destinations are valued which could contribute to the knowledge needed to achieve a shift in the tourism travel behaviour.

Future research could also delve deeper into understanding the value of distance in holiday destination choices by examining distances on different scales beyond the scope of long-distance flights. It was explained in the key findings that it could be possible that distances of 2000 kilometres are already sufficiently distant to reach attractive holiday destinations and therefore distance is not seen as an important attribute in this research. While this study focused on comparing destinations reachable by long-distance flights of 5500 and 9000 kilometres with a relatively shorter flight of 2000 kilometres, it remains unclear in this research if individuals value distances differently within shorter ranges. Van Cranenburgh et al. (2014) already showed by conducting a research with a maximum of 1500 kilometres that larger distances result in a higher utility. However, their findings are based on a study exploring holiday behaviour under high travel cost conditions. Taking this into account, it is assumed that the value of distance changes into a larger positive value when smaller distances are considered in a choice experiment where more realistic travel cost conditions are incorporated. This assumption could be examined by conducting a similar experiment as conducted in this study but focusing on shorter distances and the corresponding types of holidays. Investigating how individuals value distance across various distance ranges could contribute to the understanding of the field of tourism travel behaviour and may lead to new implications for sustainable tourism practices.

Another possible explanation for the unexpected effect of distance could be that the sample may not be representative of the population of Dutch tourists. A possible explanation for the unexpected effect of distance could be that the sample may not be representative of the population of Dutch tourists. Future research could address this by replicating the study with a larger and more diverse sample to ensure greater representativeness.

References

Aamaas, B., Borken-Kleefeld, J., & Peters, G. P. (2013). The climate impact of travel behavior: A german case study with illustrative mitigation options. *Environmental Science & Policy*, *33*, 273–282.

AFAR. (2019). *How "flygskam," or "flight shame," could change the way we all travel*. https://www.afar.com/magazine/how-flygskam-or-flight-shame-could-change-the-way-we-all-travel

Åkerman, J., Kamb, A., Larsson, J., & Nässén, J. (2021). Low-carbon scenarios for long-distance travel 2060. *Transportation Research Part D: Transport and Environment*, *99*, 103010.

Andrés, L., & Padilla, E. (2018). Driving factors of GHG emissions in the EU transport activity. *Transport Policy*, *61*, 60–74. https://doi.org/10.1016/j.tranpol.2017.10.008

Baloglu, S. (2001). Image variations of turkey by familiarity index: Informational and experiential dimensions. *Tourism management*, *22*(2), 127–133.

Barros, C. P., Butler, R., & Correia, A. (2008). Heterogeneity in destination choice: Tourism in africa. *Journal of Travel Research*, *47*(2), 235–246.

Benallal, H., Mourchid, Y., Abouelaziz, I., Alfalou, A., Tairi, H., Riffi, J., & El Hassouni, M. (2022). A new approach for removing point cloud outliers using box plot. *Pattern recognition and tracking XXXIII*, *12101*, 63–69.

Bentham, J. (1970). An introduction to the principles of morals and legislation (1789), ed. by j. *H Burns and HLA Hart, London*.

Bi, J., & Gu, C. (2019). Cultural distance and international tourists' intention to visit a destination. *Asia Pacific Journal of Tourism Research*, *24*(8), 839–849.

Bierlaire, M. (1998). Discrete choice models. In *Operations research and decision aid methodologies in traffic and transportation management* (pp. 203–227). Springer.

Bigano, A., Hamilton, J. M., & Tol, R. S. (2006). The impact of climate on holiday destination choice. *Climatic change*, *76*(3-4), 389–406.

Björk, P., & Kauppinen-Räisänen, H. (2017). Interested in eating and drinking? how food affects travel satisfaction and the overall holiday experience. *Scandinavian Journal of Hospitality and Tourism*, *17*(1), 9–26.

Boley, B. B., & Jordan, E. (2023). Leveraging ipa gap scores to predict intent to travel. *Journal of Hospitality and Tourism Management*, *57*, 97–101.

Boto-García, D., Alvarez, A., & Baños, J. (2021). Modelling heterogeneous preferences for nature-based tourism trips. *Papers in Regional Science*, *100*(6), 1625–1653.

Cao, J., Zhang, J., Wang, C., Hu, H., & Yu, P. (2020). How far is the ideal destination? distance desire, ways to explore the antinomy of distance effects in tourist destination choice. *Journal of Travel Research*, *59*(4), 614–630.

Cardoso, L., Araújo Vila, N., de Araújo, A. F., & Dias, F. (2020). Food tourism destinations' imagery processing model. *British Food Journal*, *122*(6), 1833–1847.

CBS. (2019). *Opleidingsniveau*. https://www.cbs.nl/nl-nl/nieuws/2019/33/verschil-levensverwachting-hoog-en-laagopgeleid-groeit/opleidingsniveau

CBS. (2023a). *Vakanties van nederlanders; kerncijfers*. https://www.cbs.nl/nl-nl/cijfers/detail/85302NED

CBS. (2023b). *Verdeling gestandaardiseerd inkomen*. https://www.cbs.nl/nl-nl/visualisaties/inkomensverdeling

Chorus, C. (2012). Random regret-based discrete choice modeling: A tutorial.

Chorus, C. (2022). *Discrete choice modeling and the logit model*. https://brightspace.tudelft.nl/d2l/le/content/401506/viewContent/2239904/View

Christensen, L. (2016). Environmental impact of long distance travel. *Transportation Research Procedia*, *14*, 850–859.

Cuevas, R. P., Custodio, M. C., Ynion, J., Samaddar, A., & Demont, M. (2021). Gastronomic systems research. In *Gastronomy and food science* (pp. 55–74). Elsevier.

Cuevas, R. P., de Guia, A., & Demont, M. (2017). Developing a framework of gastronomic systems research to unravel drivers of food choice. *International Journal of Gastronomy and Food Science*, *9*, 88–99.

Dann, G. M. (1977). Anomie, ego-enhancement and tourism. *Annals of tourism research*, *4*(4), 184–194.

De Bekker-Grob, E. W., Hol, L., Donkers, B., Van Dam, L., Habbema, J. D. F., Van Leerdam, M. E., Kuipers, E. J., Essink-Bot, M.-L., & Steyerberg, E. W. (2010). Labeled versus unlabeled discrete choice experiments in health economics: An application to colorectal cancer screening. *Value in Health*, *13*(2), 315–323.

Dinnie, K. (2007). Competitive identity: The new brand management for nations, cities and regions.

Douglas, A., Hoogendoorn, G., & Richards, G. (2023). Activities as the critical link between motivation and destination choice in cultural tourism. *Journal of Hospitality and Tourism Insights*.

Elliot, S., Papadopoulos, N., & Kim, S. S. (2011). An integrative model of place image: Exploring relationships between destination, product, and country images. *Journal of travel research*, *50*(5), 520–534.

Europees Parlement. (2023). *Uitstoot van vliegtuigen en schepen: Feiten en cijfers*. Retrieved June 14, 2022, from https://www.europarl.europa.eu/news/nl/headlines/society/20191129STO67756/uitstoot-van-vliegtuigen-en-schepen-feiten-en-cijfers-infografiek

Eymann, A., & Ronning, G. (1997). Microeconometric models of tourists' destination choice. *Regional science and urban economics*, *27*(6), 735–761.

Financial Times. (2020). *Turbulence rocks aviation industry*. https://www.ft.com/content/3317dacd-11fd-4df3-b0ed-c1b297506225

Garcia, J., Juaneda, C., Raya, J. M., & Sastre, F. (2015). A study of traveller decision-making determinants: Prioritizing destination or travel mode? *Tourism Economics*, *21*(6), 1149–1167.

Goh, C. (2012). Exploring impact of climate on tourism demand. *Annals of tourism research*, *39*(4), 1859–1883.

Gössling, S., Abegg, B., & Steiger, R. (2016). "it was raining all the time!": Ex post tourist weather perceptions. *Atmosphere*, *7*(1), 10.

Gössling, S., & Peeters, P. (2015). Assessing tourism's global environmental impact 1900–2050. *Journal of Sustainable Tourism*, *23*(5), 639–659.

Gössling, S., Peeters, P., Ceron, J.-P., Dubois, G., Patterson, T., & Richardson, R. B. (2005). The eco-efficiency of tourism. *Ecological economics*, *54*(4), 417–434.

Greenpeace. (2022). *Bullshitvluchten van de baan!* https://www.greenpeace.org/nl/actie-op-schiphol/

Harrison-Hill, T. (2000). *Implications of long haul travel on the marketing of international tourism*. Griffith University Qeensland.

Harrison-Hill, T. (2001). How far is a long way? contrasting two cultures' perspectives of travel distance. *Asia Pacific Journal of Marketing and Logistics*, *13*(3), 3–17.

IATA. (2022). *Air passenger numbers to recovery in 2024*. https://www.iata.org/en/pressroom/2022-releases/2022-03-01-01/

Jackman, M., Lorde, T., Naitram, S., & Greenaway, T. (2020). Distance matters: The impact of physical and relative distance on pleasure tourists' length of stay in barbados. *Annals of Tourism Research*, *80*, 102794.

Janzen, M., Vanhoof, M., Smoreda, Z., & Axhausen, K. W. (2018). Closer to the total? long-distance travel of french mobile phone users. *Travel Behaviour and Society*, *11*, 31–42.

Jeuring, J., & Haartsen, T. (2018). The challenge of proximity: The (un) attractiveness of near-home tourism destinations. In *Proximity and intraregional aspects of tourism* (pp. 115–138). Routledge.

Jeuring, J., & Peters, K. B. M. (2013). The influence of the weather on tourist experiences: Analysing travel blog narratives. *Journal of Vacation Marketing*, *19*(3), 209–219.

Ji, M., Wong, I. A., Eves, A., & Scarles, C. (2016). Food-related personality traits and the moderating role of novelty-seeking in food satisfaction and travel outcomes. *Tourism Management*, *57*, 387–396.

Johnson, F. R., Lancsar, E., Marshall, D., Kilambi, V., Mühlbacher, A., Regier, D. A., Bresnahan, B. W., Kanninen, B., & Bridges, J. F. (2013). Constructing experimental designs for discrete-choice experiments: Report of the ispor conjoint analysis experimental design good research practices task force. *Value in health*, *16*(1), 3–13.

Kamb, A., Lundberg, E., Larsson, J., & Nilsson, J. (2021). Potentials for reducing climate impact from tourism transport behavior. *Journal of Sustainable Tourism*, *29*(8), 1365–1382.

Karl, M., Muskat, B., & Ritchie, B. W. (2020). Which travel risks are more salient for destination choice? an examination of the tourist's decision-making process. *Journal of Destination Marketing & Management*, *18*, 100487.

Karl, M., & Reintinger, C. (2017). Investigating tourists' destination choices-an application of network analysis. *European Journal of Tourism Research*, *15*, 112–130.

Karl, M., Reintinger, C., & Schmude, J. (2015). Reject or select: Mapping destination choice. *Annals of Tourism Research*, *54*, 48–64.

Keshavarzian, P., & Wu, C.-L. (2017). A qualitative research on travellers' destination choice behaviour. *International Journal of Tourism Research*, *19*(5), 546–556.

Knoope, M. (2023). Nieuwe waarderingskengetallen voor reistijd, betrouwbaarheid en comfort. *Kennisinstituut voor Mobiliteitsbeleid*.

Kozak, M. (2002). Comparative analysis of tourist motivations by nationality and destinations. *Tourism management*, *23*(3), 221–232.

Larsen, G., & Guiver, J. (2013). Understanding tourists'perceptions of distance: A key to reducing the environ-mental impacts of tourism mobility. *Journal of Sustainable Tourism*, *21*(7), 968–981.

Lee, Chen, H.-S., Liou, G.-B., Tsai, B.-K., & Hsieh, C.-M. (2018). Evaluating international tourists' perceptions on cultural distance and recreation demand. *Sustainability*, *10*(12), 4360.

Lee, D., Fahey, D., Skowron, A., Allen, M., Burkhardt, U., Chen, Q., Doherty, S., Freeman, S., Forster, P., Fuglestvedt, J., et al. (2021). The contribution of global aviation to anthropogenic climate forcing for 2000 to 2018. *Atmospheric Environment*, *244*, 117834.

Lenzen, M., Sun, Y.-Y., Faturay, F., Ting, Y.-P., Geschke, A., & Malik, A. (2018). The carbon footprint of global tourism. *Nature climate change*, *8*(6), 522–528.

Lertputtarak, S. (2012). The relationship between destination image, food image, and revisiting pattaya, thailand. *International Journal of Business and Management*, *7*(5), 111–121.

Limtanakool, N., Dijst, M., & Schwanen, T. (2006). The influence of socioeconomic characteristics, land use and travel time considerations on mode choice for medium-and longer-distance trips. *Journal of transport geography*, *14*(5), 327–341.

Liu, H., Li, X. R., Cárdenas, D. A., & Yang, Y. (2018). Perceived cultural distance and international destination choice: The role of destination familiarity, geographic distance, and cultural motivation. *Journal of Destination Marketing & Management*, *9*, 300–309.

Lyons, S., Mayor, K., & Tol, R. S. (2009). Holiday destinations: Understanding the travel choices of irish tourists. *Tourism management*, *30*(5), 683–692.

Malhi, G. S., Kaur, M., & Kaushik, P. (2021). Impact of climate change on agriculture and its mitigation strategies: A review. *Sustainability*, *13*(3), 1318.

Malichová, E., Cornet, Y., & Hudák, M. (2022). Travellers' use and perception of travel time in long-distance trips in europe. *Travel Behaviour and Society*, *27*, 95–106.

Manwa, H., Moswete, N., & Saarinen, J. (2016). *Cultural tourism in southern africa* (Vol. 47). Channel View Publications.

Mehmetoglu, M., & Normann, Ø. (2013). The link between travel motives and activities in nature-based tourism. *Tourism review*, *68*(2), 3–13.

Mikhaylov, A., Moiseev, N., Aleshin, K., & Burkhardt, T. (2020). Global climate change and greenhouse effect. *Entrepreneurship and Sustainability Issues*, *7*(4), 2897.

Milieu Centraal. (2023). *Vliegen of ander vakantievervoer*. Retrieved September 7, 2022, from https://www.milieucentraal.nl/duurzaam-vervoer/duurzaam-op-vakantie/vliegen-of-ander-vakantievervoer/

Ministerie van Infrastructuur en Waterstaat. (2023). *Rollen en verantwoordelijkheden*. https://www.luchtvaartindetoekomst.nl/onderwerpen/samenwerking/rollen-en-verantwoordelijkheden

Mokhtarian, P. L., & Salomon, I. (2001). How derived is the demand for travel? some conceptual and measurement considerations. *Transportation research part A: Policy and practice*, *35*(8), 695–719.

Molin, E. (2022). *Introduction to expiremental designs*. https://brightspace.tudelft.nl/d2l/le/content/401506/viewContent/2239880/View

Molin, E., Blangé, J., Cats, O., & Chorus, C. (2017). Willingness to pay for safety improvements in passenger air travel. *Journal of Air Transport Management*, *62*, 165–175.

Molin, E., & Timmermans, H. (2009). Hierarchical information integration experiments and integrated choice experiments. *Transport reviews*, *29*(5), 635–655.

Moutinho, L., & Trimble, J. (1991). A probability of revisitation model: The case of winter visits to the grand canyon. *Service Industries Journal*, *11*(4), 439–457.

New Scientist. (n.d.). *Occam's razor*. https://www.newscientist.com/definition/occams-razor/

Nicolau, J. (2008). Characterizing tourist sensitivity to distance. *Journal of Travel Research*, *47*(1), 43–52.

Nicolau, J., & Más, F. (2006). The influence of distance and prices on the choice of tourist destinations: The moderating role of motivations. *Tourism Management*, *27*(5), 982–996.

Nikjoo, A. H., & Ketabi, M. (2015). The role of push and pull factors in the way tourists choose their destination. *Anatolia*, *26*(4), 588–597.

NOS. (2019). *Wie zijn eigenlijk de middeninkomens?* https://nos.nl/collectie/13785/artikel/2301635-wie-zijn-eigenlijk-de-middeninkomens

NOS. (2023). *Vliegmaatschappijen versus de staat: Mag schiphol krimpen?* https://nos.nl/artikel/2468340-vliegmaatschappijen-versus-de-staat-mag-schiphol-krimpen

Nylund-Gibson, K., & Choi, A. Y. (2018). Ten frequently asked questions about latent class analysis. *Translational Issues in Psychological Science*, *4*(4), 440.

OAG. (2024). *Covid-19 air travel recovery*. https://www.oag.com/coronavirus-airline-schedules-data

Özdemir, M. A. (2022). Travellers' destination attribute preferences: A choice-based conjoint (cbc) analysis. *Academica Turistica-Tourism and Innovation Journal*, *15*(2).

Paetz, F., Hein, M., Kurz, P., & Steiner, W. (2019). Latent class conjoint choice models: A guide for model selection, estimation, validation, and interpretation of results. market zfp j res manag 41: 3–20.

Peeters, P., Gossling, S., & Becken, S. (2006). Innovation towards tourism sustainability: Climate change and aviation. *International journal of innovation and sustainable development*, *1*(3), 184–200.

Peeters, P., Szimba, E., & Duijnisveld, M. (2007). Major environmental impacts of european tourist transport. *Journal of Transport Geography*, *15*(2), 83–93.

RTL Nieuws. (2024). *Zes keer wakker door vliegtuiglawaai: 'alleen rechter kan voor stilte zorgen'*. https://www.rtlnieuws.nl/economie/artikel/5431629/schiphol-zaak-rechter-stilte-omwonenden-geluid

Scott, D., Peeters, P., & Gössling, S. (2010). Can tourism deliver its "aspirational" greenhouse gas emission reduction targets? *Journal of Sustainable Tourism*, *18*(3), 393–408.

Seabra, C., Dolnicar, S., Abrantes, J. L., & Kastenholz, E. (2013). Heterogeneity in risk and safety perceptions of international tourists. *Tourism Management*, *36*, 502–510.

Shocker, A. D., Ben-Akiva, M., Boccara, B., & Nedungadi, P. (1991). Consideration set influences on consumer decision-making and choice: Issues, models, and suggestions. *Marketing letters*, *2*, 181–197.

Steiger, R., Abegg, B., & Jänicke, L. (2016). Rain, rain, go away, come again another day. weather preferences of summer tourists in mountain environments. *Atmosphere*, *7*(5), 63.

Taylor, C. E., & Knudson, D. M. (1973). Area preferences of midwestern campers. *Journal of Leisure Research*, *5*(2), 39–48.

Telhado Pereira, P., Almeida, A., Gomes de Menezes, A., & Cabral Vieira, J. (2007). How do consumers value airline services attributes? a stated preferences discrete choice model approach. *Management: Journal of Contemporary Management Issues*, *12*(2), 25–40.

Thomas, K., Hardy, R. D., Lazrus, H., Mendez, M., Orlove, B., Rivera-Collazo, I., Roberts, J. T., Rockman, M., Warner, B. P., & Winthrop, R. (2019). Explaining differential vulnerability to climate change: A social science review. *Wiley Interdisciplinary Reviews: Climate Change*, *10*(2), e565.

Van Cranenburgh, S., Chorus, C., & van Wee, B. (2014). Vacation behaviour under high travel cost conditions–a stated preference of revealed preference approach. *Tourism Management*, *43*, 105–118.

van Goeverden, K., van Arem, B., & van Nes, R. (2016). Volume and ghg emissions of long-distance travelling by western europeans. *Transportation Research Part D: Transport and Environment*, *45*, 28–47.

van Wee, B., & Mokhtarian, P. (2023). Escape theory: Explaining a negative motivation to travel. *Transportation research part A: policy and practice*, *169*, 103603.

Velea, L., Gallo, A., Bojariu, R., Irimescu, A., Craciunescu, V., & Puiu, S. (2022). Holiday climate index: Urban—application for urban and rural areas in romania. *Atmosphere*, *13*(9), 1519.

Verma, T., Rebelo, L., & Araújo, N. A. (2019). Impact of perceived distances on international tourism. *Plos one*, *14*(12), e0225315.

Vietze, C. (2012). Cultural effects on inbound tourism into the usa: A gravity approach. *Tourism Economics*, *18*(1), 121–138.

Weller, B. E., Bowen, N. K., & Faubert, S. J. (2020). Latent class analysis: A guide to best practice. *Journal of Black Psychology*, *46*(4), 287–311.

Wu, L., Zhang, J., & Fujiwara, A. (2011). Representing tourists' heterogeneous choices of destination and travel party with an integrated latent class and nested logit model. *Tourism Management*, *32*(6), 1407–1413.

Yoo, C.-K., Yoon, D., & Park, E. (2018). Tourist motivation: An integral approach to destination choices. *Tourism review*, *73*(2), 169–185.

Zijlstra, T., & Uitbeijerse, G. (2022). Vliegen na corona? de vliegintentie en houding ten opzichte van de luchtvaart van nederlanders na twee jaar covid-19.

A. Systematic literature review

Literature from the database Scopus is used to perform the literature review. To collect literature for the perception of the value of distance and for the destination attractiveness and trip-related attributes the following search strings and selection method were applied sequentially:

Perception of the value of distance: Tourism AND (distance OR ”travel distance”) AND perception OR perspective. The papers were filtered to only English papers which resulted in 222 papers. After scanning the titles and abstracts, there were still 12 articles remaining. In the end, 7 articles were included for the literature review on the perceived value of distance (see table A.1).

Table A.1: Systematic literature review on the perceived value of distance

Title:	Author(s) & year:	Journal:
Understanding tourists’ perceptions of distance: A key to reducing the environmental impacts of tourism mobility	Larsen and Guiver, 2013	Journal of Sustainable Tourism
How far is a long way? Contrasting two cultures’ perspectives of travel distance	Harrison-Hill, 2001	Journal of Marketing and Logistics
Cultural distance and international tourists’ intention to visit a destination	Bi and Gu, 2019	Journal of Tourism Research
The challenge of proximity: the (un) attractiveness of near-home tourism destinations	Jeuring and Haartsen, 2018	Proximity and Intraregional Aspects of Tourism
Impact of perceived distances on international tourism	Verma et al., 2019	
Competitive identity: The new brand management for nations, cities and regions	Dinnie, 2007	
Travellers’ use and perception of travel time in long-distance trips in Europe	Malichová et al., 2022	Travel Behaviour and Society

Destination attractiveness and trip-related attributes: (”travel behavior” OR ”tourism travel behaviour” OR tourists) AND ”destination choice”. The papers were filtered to only English papers which resulted in 700 papers. After scanning the titles and abstracts, there were still 58 articles remaining. In the end, 23 articles were included for the literature review on the perceived value of distance (see table A.2).

Table A.2: Systematic literature review on the destination attractiveness attributes

Title:	Author(s) & year:	Journal:
Activities as the critical link between motivation and destination choice in cultural tourism	Douglas et al., 2023	Journal of Hospitality and Tourism Insights
The link between travel motives and activities in nature-based tourism	Mehmetoglu and Normann, 2013	Tourism review
Travellers' destination attribute preferences: A choice-based conjoint (cbc) analysis	Özdemir, 2022	Academica Turistica-Tourism and Innovation Journal
Modelling heterogeneous preferences for nature-based tourism trips	Boto-García et al., 2021	Papers in Regional Science
Food tourism destinations' imagery processing model	Cardoso et al., 2020	British Food Journal
Tourist motivation: An integral approach to destination choices	Yoo et al., 2018	Tourism review
A qualitative research on travellers' destination choice behaviour	Keshavarzian and Wu, 2017	International Journal of Tourism Research
Image variations of turkey by familiarity index: Informational and experiential dimensions	Baloglu, 2001	Tourism Management
Interested in eating and drinking? how food affects travel satisfaction and the overall holiday experience	Björk and Kauppinen-Räisänen, 2017	Scandinavian Journal of Hospitality and Tourism
Investigating tourists' destination choices-an application of network analysis	Karl and Reintinger, 2017	European Journal of Tourism Research
Rain, rain, go away, come again another day. weather preferences of summer tourists in mountain environments	Steiger et al., 2016	Atmosphere
A study of traveller decision-making determinants: Prioritizing destination or travel mode?	Garcia et al., 2015	Tourism Economics
The role of push and pull factors in the way tourists choose their destination	Nikjoo and Ketabi, 2015	Anatolia
Reject or select: Mapping destination choice	Karl et al., 2015	Annals of Tourism Research
Exploring impact of climate on tourism demand	Goh, 2012	Annals of tourism research
Representing tourists' heterogeneous choices of destination and travel party with an integrated latent class and nested logit model	Wu et al., 2011	Tourism Management
Leveraging IPA gap scores to predict intent to travel	Boley and Jordan, 2023	Journal of Hospitality and Tourism Management
Characterizing tourist sensitivity to distance	Nicolau, 2008	Journal of Travel Research
Heterogeneity in destination choice: Tourism in africa	Barros et al., 2008	Journal of Travel Research
Heterogeneity in risk and safety perceptions of international tourists	Seabra et al., 2013	Tourism Management
The impact of climate on holiday destination choice	Bigano et al., 2006	Climate change
The influence of distance and prices on the choice of tourist destinations: The moderating role of motivations	Nicolau and Más, 2006	Toruism Management
Perceived cultural distance and international destnation choice: The role of destination familiarity, geographic distance, and cultural motivation	Liu et al., 2018	Journal of Destination Marketing Management

B. Interview outcomes

Table B.1 shows the reasons the interviewees named when answering the question: ”For what reasons did you choose this destination?”. The responses provided by individuals are classified into the attributes outlined in the table. For instance, if someone mentioned, ’I chose this holiday destination because I have been there before and have fond memories of it,’ this response was categorized under ’familiarity’ since the person is familiar with the destination. Conversely, if someone stated, ’I chose this destination because I have never been there,’ it was also assigned to familiarity because the person is not familiar with the destination. The mention of familiarity-related aspects in the responses indicates that the individual’s decision to visit the destination, along with considering other factors, was influenced by whether or not they were familiar with it.

Table B.1: Interview outcomes

				Reasons for holiday destination								
	Age	**Gender**	**Travel company**	**Climate**	**Temperature**	**Distance**	**Cultural difference**	**Type of destination**	**Cost**	**Familiar**	**Safety**	**Food**
Person 1	38	Woman	Partner and kids	x	x			x				
Person 2	40	Man	Partner and kids					x	x	x	x	
Person 3	34	Woman	Parrtner and kids	x				x		x		
Person 4	24	Woman	Friends	x	x	x	x	x	x	x		x
Person 5	50	Man	Partner		x	x		x				
Person 6	32	Man	Partner	x	x	x	x	x	x	x		
Person 7	25	Woman	Alone	x	x	x	x	x	x	x		x
Person 8	24	Woman	Friends	x	x			x	x			x
Person 9	39	Man	Partner and kids	x	x	x		x	x			
Person 10	45	Man	Partner	x	x			x	x			x
Person 11	24	Woman	Alone			x	x	x				
Person 12	57	Woman	Partner		x	x		x	x	x		x
Person 13	63	Man	Partner		x	x		x		x		
Person 14	38	Woman	Partner and kids	x		x		x	x	x		
Person 15	50	Man	Partner					x		x		
Person 16	28	Woman	Alone	x	x	x	x	x				x
Person 17	32	Woman	Partner	x	x			x		x		x
Person 18	35	Man	Partner and kids			x		x	x	x		
Person 19	26	Woman	Friends		x			x	x			
Person 20	25	Woman	Alone	x	x	x	x	x	x			x

C. Attribute and attribute level selection

Table C.1: Dutch translation rating experiment

Rating experiment **Attributes**	**# Levels**	**Attribute levels**
Type vakantie	3	Actieve vakantie: natuur, bergen, parken, bossen Sightseeing vakantie: stad, cultuur, musea Relax vakantie: zon, zee, strand, zwembad
Weersverwachting	3	Bewolkt met zon Regenachtig met zon Zon
Temperatuur	3	18-24 graden Celsius 24-30 graden Celsius 30-36 graden Celsius
Uw bekendheid met de bestemming	3	Bekende bestemming, eerder bezocht en goed bevallen Onbekende bestemming, ook niet eerder bezocht door vrienden Onbekende bestemming, aanbevolen door vrienden
Eten	3	Rijkelijk lokaal, authentiek, traditioneel eten Westers eten Combinatie van rijkelijk lokaal, authentiek, traditioneel eten en Westers eten
Cultuurverschil (ten opzichte van Nederland)	3	Weinig cultuurverschil Enigszins cultuurverschil Groot cultuurverschil

Table C.2: Dutch translation choice experiment

Choice Experiment (version 1) **Attributes**	**# Levels**	**Attribute levels**	**Unit**
Aantrekkelijkheid van de bestemming	3	6	cijfer
		8	cijfer
		10	cijfer
Afstand	3	2000	kilometer
		5500	kilometer
		9000	kilometer
Reistijd (deur-tot-deur)	3	10	uur
		13	uur
		16	uur
Reiskosten per persoon	3	300	euro
		600	euro
		900	euro
Totale vakantiekosten per persoon (excl. reiskosten)	3	700	euro
		1400	euro
		2100	euro

Table C.3: Dutch translation socio-demographic characteristics

Socio-demographic characteristics **Variable**	**Category**
Geslacht	Man
	Vrouw
	Anders
	Zeg ik liever niet
Geboortejaar	(open vraag)
Opleiding	Basisonderwijs
	Vmbo
	Havo
	Wvo
	MBO-1, 2, 3
	MBO-4
	HBO
	WO
Werksituatie	Student
	Niet werkend
	Werkend (voltijd)
	Werkend (deeltijd)
	Vrijwilliger
	Gepensioneerd
	Zeg ik liever niet
	Anders
Inkomen per maand	<1.000 €
	1.000 - 1,999 €
	2.000 - 2.999 €
	3.000 - 3.999 €
	4.000 - 4.999 €
	5.000 - 5.999 €
	6.000 - 6.999 €
	>7.000 €
	Prefer not to say
Reisgezelschap	Alleen
	Met een vriend(in)
	Vriendengroep
	Partner
	Partner met kinderen
	Zonder partner, met kinderen
	Ouders
	Anders
Huishoud samenstelling	Samenwonend met partner
	Samenwonend met thuiswonend(e) kind(eren)
	Alleenstaand
	Alleenstaand met thuiswonend(e) kind(eren)
	Samenwonend met vrienden
	Wonend bij ouder(s)/verzorgers
	Anders

Socio-demographic characteristics **Variable**	**Category**
#vluchten binnen Europa voor vakantie in de afgelopen 5 jaar	0 keer
	1-2 keer
	3-5 keer
	6-10 keer
	11 keer of meer
#vluchten buiten Europa voor vakantie in de afgelopen 5 jaar	0 keer
	1-2 keer
	3-5 keer
	6-10 keer
	11 keer of meer
#vluchten voor privé redenen in de afgelopen 12 maanden	0 keer
	1 keer
	2 keer
	3 keer
	4 keer
	5 keer
	6 keer of meer
Gemiddeld aantal vluchten per jaar	0-1 keer
	1-2 keer
	2-3 keer
	3-4 keer
	4-5 keer
	5 keer of meer
Woonplaats	Grote stad: > 350.000 inwoners (Amsterdam, Rotterdam, Den Haag, Utrecht)
	Middelgrote stad: 100.000 - 350.000 inwoners
	Groot dorp
	Klein dorp
	Buitengebied
	Anders

D. Experimental Design

D.1. Rating experiment

The initial rating experiment before testing contained 6 attributes, all with 3 levels. However, after testing, one attribute was excluded so only 5 attributes are included in the final experimental design of the rating experiment. This section of the appendix shows how the experimental design with 5 attributes is constructed.

Basic plan

An orthogonal design is applied for the rating experiment. Therefore, a basic plan is used to decide how many choice sets are needed. According to 'Basic plan 4' (see figure D.1), 18 choice sets are needed to create an orthogonal fractional design with no correlations and with attribute level balance.

BASIC PLAN 4: 3^7; 18 trials

1	2	3	4	5	6	7
0	0	0	0	0	0	0
0	1	1	2	1	1	1
0	2	2	1	2	2	2
1	0	1	1	1	2	0
1	1	2	0	2	0	1
1	2	0	2	0	1	2
2	0	2	2	1	0	2
2	1	0	1	2	1	0
2	2	1	0	0	2	1
0	0	2	1	0	1	1
0	1	0	0	1	2	2
0	2	1	2	2	0	0
1	0	0	2	2	2	1
1	1	1	1	0	0	2
1	2	2	0	1	1	0
2	0	1	0	2	1	2
2	1	2	2	0	2	0
2	2	0	1	1	0	1

Figure D.1: Basic plan 4

Ngene syntax

Table D.1 shows the abbreviations utilized in Ngene to refer to both attribute weights and attributes.

Table D.1: Attribute abbreviations rating experiment

Attribute	Attribute weight abbreviation	Attribute abbreviation
Destination type	beta_type	type
Weather expectations	beta_weat	weat
Temperature	beta_temp	temp
Familiarity with destination	beta_fam	fam
Cultural differences compared to the Netherlands	beta_cult	cult

Table D.2 shows the labels given to each attribute level.

Table D.2: Attribute level labels

Rating experiment Attributes	**# Levels**	**Attribute levels**
Destination type	3	Active holiday: nature, mountains, parks, forests Sightseeing holiday: city, culture, museums Relaxing holiday: sun, sea, beach, pool
Weather expectations	3	Cloudy with sun Rainy with sun Sunny
Temperature	3	18-24 degrees Celsius 24-30 degrees Celsius 30-36 degrees Celsius
Familiarity with destination	3	Familiar with destination, have visited Unfamiliar with destination, also no friend has visited Unfamiliar with destination, recommended by friends
Cultural differences compared to the Netherlands	3	Almost no cultural differences Partly cultural differences A lot of cultural differences

Ngene syntax:

```
design
;alts = dest1,base
;rows = 18
;orth = seq
;block = 2
;model:
U(dest1) = beta_type*type[0,1,2] + beta_weat*weat[0,1,2] + beta_temp*temp[0,1,2] + beta_fam*fam[0,1,2]
+ beta_cult*cult[0,1,2]
$
```

Generated design

The orthogonal design created by Ngene can be seen in figure D.2 Since it is an orthogonal design, no correlations appear.

Design						
Choice situation	dest1.type	dest1.weat	dest1.temp	dest1.fam	dest1.cult	Block
1	0	0	0	0	0	2
2	1	1	1	1	1	2
3	2	2	2	2	2	2
4	1	2	1	0	0	2
5	2	0	2	1	1	2
6	0	1	0	2	2	2
7	2	2	0	1	0	2
8	0	0	1	2	1	2
9	1	1	2	0	2	2
10	1	0	2	2	0	1
11	2	1	0	0	1	1
12	0	2	1	1	2	1
13	0	1	2	1	0	1
14	1	2	0	2	1	1
15	2	0	1	0	2	1
16	2	1	1	2	0	1
17	0	2	2	0	1	1
18	1	0	0	1	2	1
Correlations (Pearson Product Moment)						
Attribute	dest1.type	dest1.weat	dest1.temp	dest1.fam	dest1.cult	Block
dest1.type	1	0	0	0	0	0
dest1.weat	0	1	0	0	0	0
dest1.temp	0	0	1	0	0	0
dest1.fam	0	0	0	1	0	0
dest1.cult	0	0	0	0	1	0
Block	0	0	0	0	0	1

Figure D.2: Experimental design, rating experiment

D.2. Choice experiments

The initial experiment before testing contained the levels 6, 8, 10 for the attribute 'destination attractiveness'. This was changed to 6, 7, 8 as explained in 4.7.2. Therefore, also the priors were adjusted. This section of the appendix shows how the experimental design with the new levels and associating priors is constructed.

Priors

Table D.3 shows the priors that are obtained in various ways. The destination attractiveness and distance is a best guess on the parameter value. Travel cost is obtained through literature. The prior for travel time and total holiday cost are calculated in proportion to travel cost.

It is assumed that the direction of the destination attractiveness is: the higher the destination attractiveness number, the higher the utility. The destination attractiveness number is thought to have a reasonably large effect on the respondent's choice. However, it was decided to not make them too large since this might cause bias. The priors for the levels 6, 7, 8 are chosen to be -0.7, 0, 0.7 subsequently. There is considerable uncertainty regarding the prior for the attribute 'distance'. Especially there is little information on the magnitude of the prior. Previous research showed that larger distances for a holiday is associated with a higher utility (Van Cranenburgh et al., 2014). Therefore, very small priors with a positive direction are chosen. The priors for the levels 2000, 5500, 9000 are chosen to be -0.1, 0, 0.1 subsequently. Next, the prior for travel cost, the first of the three attributes that are proportionally related, was computed. In Molin et al. (2017) the coefficient for travel cost was found to be -0.241. Converted to a utility contribution of 300 euros, the prior for travel costs is estimated to be 0.723. Resulting in the priors for the levels 300, 600, 900 are chosen to be 0.723, 0, -0.723. For travel cost applies that the lower the travel cost, the higher the utility. If the prior for travel cost is 0.723, with a utility contribution of 300 euros, than the prior for total holiday cost is 1.687, for a utility contribution of

700 euros calculated proportionally. For total holiday cost also applies that the lower the travel cost, the higher the utility. The priors for the levels 700, 1400, 2100 are chosen to be 1.687, 0, -1.687. Travel time can also be calculated proportionally to travel cost since travel time can be converted into the amount of money someone is willing to pay for a shorter travel time. Knoope, 2023 indicates that the value of time for flying for private purposes is 54 euros per hour. Therefore, for a reduction in travel time of 3 hours, someone is willing to pay 162 euros. The prior for travel time is estimated to be 0.39 with a utility contribution of 162 euros that is proportionate to travel costs. The priors for the levels 700, 1400, 2100 are chosen to be 0.39, 0, -0.39.

Table D.3: Priors

Attribute	Level	Prior
Destination attractiveness	6	-0.7
	7	0
	8	0,7
Distance	2000	-0,1
	5500	0
	9000	0,1
Travel time	10	0,39
	13	0
	16	-0,39
Travel cost	300	0,723
	600	0
	900	-0,7223
Total holiday cost	700	1,687
	1400	0
	2100	-1,687

Ngene syntax

Table D.4 shows the abbreviations utilized in Ngene to refer to both attribute weights and attributes.

Table D.4: Attribute abbreviations choice experiments

Attribute	Attribute weight abbreviation	Attribute abbreviation
Destination attractiveness	beta_attr	attr
Distance	beta_dis	dis
Travel time	beta_time	time
Travel cost	beta_tc	tc
Total holiday cost	beta_thc	thc

```
design
;alts = trav1,trav2
;rows = 12
;eff = (mnl,d)
;block = 2
;model:
U(trav1) = beta_attr.effects[-0.7|0]*attr[6,7,8] + beta_dis.effects[-0.1|0]*dis[2000,5500,9000] +
beta_time.effects[0.39|0]*time[10,13,16] + beta_tc.effects[0.723|0]*tc[300,600,900] +
beta_thc.effects[1.687|0]*thc[700,1400,2100]/
U(trav2) = beta_attr*attr + beta_dis*dis + beta_time*time + beta_tc*tc + beta_thc*thc
$
```

Generated design

The D-efficient design created by Ngene can be seen in figure D.3.

Design											
Choice situation	trav1.attr	trav1.dis	trav1.time	trav1.tc	trav1.thc	trav2.attr	trav2.dis	trav2.time	trav2.tc	trav2.thc	Block
1	8	2000	13	900	700	7	9000	10	600	1400	2
2	6	9000	13	300	700	8	5500	10	900	700	1
3	8	9000	16	600	2100	6	2000	13	900	1400	1
4	8	2000	10	600	1400	7	5500	16	300	700	1
5	6	9000	10	900	1400	7	2000	16	600	2100	2
6	6	2000	16	900	700	8	5500	13	300	2100	1
7	7	9000	13	900	700	6	2000	10	300	700	2
8	7	2000	10	300	2100	6	5500	13	900	1400	1
9	7	5500	13	600	1400	8	9000	16	300	2100	1
10	6	5500	16	600	2100	7	9000	13	900	2100	2
11	7	5500	10	300	2100	8	2000	16	600	1400	2
12	8	5500	16	300	1400	6	9000	10	600	700	2
Correlations (Pearson Product Moment)											
Attribute	trav1.attr	trav1.dis	trav1.time	trav1.tc	trav1.thc	trav2.attr	trav2.dis	trav2.time	trav2.tc	trav2.thc	Block
trav1.attr	1	-0.25	0	-0.125	0.125	-0.5	0.125	-0.125	-0.125	-0.5	0
trav1.dis	-0.25	1	0.125	0	0	-0.125	-0.5	-0.125	0.25	-0.125	0.204124
trav1.time	0	0.125	1	0.125	-0.125	-0.125	0.375	-0.5	0.125	0.125	0
trav1.tc	-0.125	0	0.125	1	-0.5	0	-0.125	0	-0.5	0.375	0.204124
trav1.thc	0.125	0	-0.125	-0.5	1	-0.25	-0.125	0.5	0.5	0.25	0
trav2.attr	-0.5	-0.125	-0.125	0	-0.25	1	0.125	0.375	-0.25	0.375	-0.204124
trav2.dis	0.125	-0.5	0.375	-0.125	-0.125	0.125	1	-0.25	0	0.125	0
trav2.time	-0.125	-0.125	-0.5	0	0.5	0.375	-0.25	1	-0.25	0.5	-0.204124
trav2.tc	-0.125	0.25	0.125	-0.5	0.5	-0.25	0	-0.25	1	0	0
trav2.thc	-0.5	-0.125	0.125	0.375	0.25	0.375	0.125	0.5	0	1	0
Block	0	0.204124	0	0.204124	0	-0.204124	0	-0.204124	0	0	1

Figure D.3: Experimental design, choice experiment

E. Survey Design

Table E.1: Survey design

Label	Element	Question	Scale
Consent	-	Consent statement	-
Filter	Travel experience	Have you traveled by plane for holiday reasons at least once in the past 5 years? (2018-2023)	Binary
Survey source	-	How did you come across this questionnaire?	Nominal
Travel behaviour	Continental travel frequency	How often have you traveled by plane for holiday reasons within Europe in the past 5 years? (2018-2023)	Ordinal
	Intercontinental travel frequency	How often have you traveled by plane for holiday reasons outside Europe in the past 5 years? (2018-2023)	Ordinal
	Past 12 months travel frequency	How often have you traveled by plane for private purposes in the past 12 months? (One flight includes a round trip)	Ordinal
	Average flights per year	How often do you fly on average per year? (One flight includes a round trip)	Ordinal
Rating experiment	Rating experiment 9x	How attractive do you find this holiday destination? Express this in a grade:	Likert (1-10)
Choice experiment	Choice experiment 6x	To which of the two displayed travel options do you give preference?	Binary
Informative	Preference regaring to distance	Indicate to what extent you agree with the following statement: ”I prefer holiday destinations that are far away” (Totally disagree - Disagree - Neutral - Agree - Totally agree)	Likert (1-5)
	Consideration regerding distance	Indicate to what extent you agree with the following statement: ”I take the distance to a country or city into account when choosing a holiday destination.” (Totally disagree - Disagree - Neutral - Agree - Totally agree)	Likert (1-5)
	Reasons	What reasons do you have for this?	Open
Socio-demographic characteristics	Gender	What is your gender?	Nominal
	Age	What is your year of birth?	Interval
	Education	What is your highest level of education?	Ordinal
	Work status	Which work situation is most applicable?	Nominal
	Income per year	What is your personal gross income per year?	Interval
	Travel company	With whom do you usually go on summer vacation?	Nominal
	Household	What is your household composition?	Nominal
	Living environment	What is your living environment?	Ordinal

F. Descriptive statistics

F.1. Average completion time survey

To determine the average time it took to complete the survey, a box plot was constructed of the completion time of the respondent. Figure F.1 shows the box plot before removing the outliers. This resulted in an average completion time of 719 seconds (11 minutes and 59 seconds).

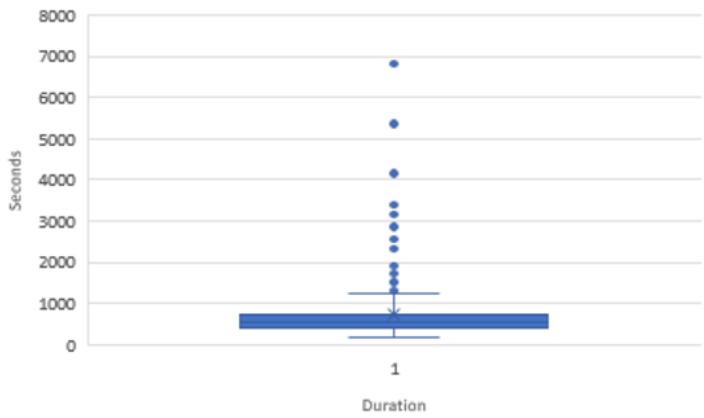

Figure F.1: Box plot average completion time before removal outliers

The Interquartile Range (IQR) approach is employed to detect outliers in the dataset. This method involves dividing the dataset into four equal parts: Q1, Q2, Q3, and Q4. Q1 represents the 25th percentile, Q2 the 50th percentile, and Q3 the 75th percentile. The IQR is computed as Q3 - Q1. Outliers are identified as data points falling below the lower limit (Q1 - 1.5 * IQR) or above the upper limit (Q3 + 1.5 * IQR). For this research, with an IQR of 345.25, the lower limit is adjusted to 0 since negative values are impossible, and the upper limit is 1253.375. A total of 20 data points are identified as outliers and subsequently removed from the dataset to calculate the average completion time. After outlier removal, a new box plot is generated, illustrating the refined dataset, see figure F.2. The average completion time of the survey after removing the outliers is now 535 seconds (8 minutes, 55 seconds).

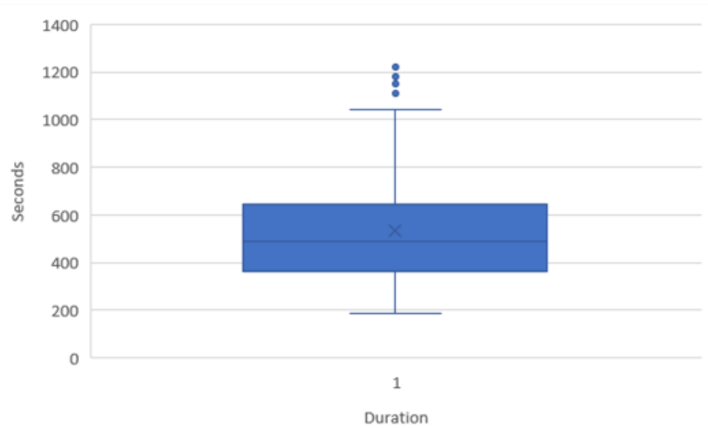

Figure F.2: Box plot average completion time after removal outliers

G. Apollo syntax

G.1. Syntax Linear Regression Model

```
### Fit the model with effect coding
model_effect <- lm(Rating   type + weat + temp + fam + cult, data = DATA_Rat_Exp_B12)

### Display the summary
summary(model_effect)

plot(model_effect)

### Extract p-values for each coefficient
p_values <- summary(model_effect)$coefficients[, 4]

### Define a significance level (e.g., 0.05)
significance_level <- 0.05

### Identify non-significant coefficients
non_significant <- p_values > significance_level

### Print non-significant coefficients
cat(”Non-significant coefficients to be removed: n”)
print(names(non_significant[non_significant]))

### Remove non-significant coefficients from the model
model_effect_sig <- update(model_effect, .     . - paste(names(non_significant[nonc_significant]), col-
lapse = ” - ”))

### Display the summary of the final model
summary(model_effect_sig)

#### EXTENTION ####

i=1
ND<-data.frame(X1=0, X2=0, X3=1,
type = levels(merged_rat_classes$type)[i],
weat = levels(merged_rat_classes$weat)[i],
temp = levels(merged_rat_classes$temp)[i],
fam = levels(merged_rat_classes$fam)[i],
cult = levels(merged_rat_classes$cult))

predict(model_effect, newdata= ND, type = ’respons’) - predict(model_effect, newdata= ND, type =
’respons’)[3]
```

G.2. Syntax MNL Model

```
### Load Apollo library
library(apollo)

### Initialise code
apollo_initialise()
```

```
### Set core controls
apollo_control = list(
modelName ="MNL_Ch_Exp_V1",
modelDescr ="MNL model Choice Experiment Version 1",
indivID ="ResponseId"
)

### Vector of parameters, including any that are kept fixed in estimation
apollo_beta = c(BETA_dis = 0,
BETA_attr = 0,
BETA_time = 0,
BETA_tc = 0,
BETA_thc = 0)

summary(database)

### Vector with names (in quotes) of parameters to be kept fixed at their starting value in apollo_beta,
use apollo_beta_fixed = c() if none
apollo_fixed = c()

### Sort data by ResponseId
database <- database[order(database$ResponseId), ]
### Check for missing values
if (any(is.na(database)))
# Handle missing values (e.g., remove or impute)
database = na.omit(database) # Remove rows with missing values


### GROUP AND VALIDATE INPUTS
apollo_inputs = apollo_validateInputs()

### DEFINE MODEL AND LIKELIHOOD FUNCTION

apollo_probabilities=function(apollo_beta, apollo_inputs, functionality="estimate")

### Attach inputs and detach after function exit
apollo_attach(apollo_beta, apollo_inputs)
on.exit(apollo_detach(apollo_beta, apollo_inputs))

### Create list of probabilities P
P = list()

### List of utilities: these must use the same names as in mnl_settings, order is irrelevant
V = list()
V[['A']] = (trav1.dis/1000) * BETA_dis + trav1.attr * BETA_attr + trav1.time * BETA_time + (trav1.tc/100)
* BETA_tc + (trav1.thc/100) * BETA_thc
V[['B']] = (trav2.dis/1000) * BETA_dis + trav2.attr * BETA_attr + trav2.time * BETA_time + (trav2.tc/100)
* BETA_tc + (trav2.thc/100) * BETA_thc

### Define settings for MNL model component
mnl_settings = list(
alternatives = c(A=1, B=2),
avail = list(A=1, B=1),
choiceVar = Choice,
V = V
)
```

Compute probabilities using MNL model
P[['model']] = apollo_mnl(mnl_settings, functionality)

Take product across observation for same individual
P = apollo_panelProd(P, apollo_inputs, functionality)

Prepare and return outputs of function
P = apollo_prepareProb(P, apollo_inputs, functionality)
return(P)

MODEL ESTIMATION
MNLmodel.Ch.Exp.V1.Lin = apollo_estimate(apollo_beta, apollo_fixed, apollo_probabilities, apollo_inputs)

MODEL OUTPUTS
apollo_modelOutput(MNLmodel.Ch.Exp.V1.Lin,modelOutput_settings=list(printPVal=TRUE))

apollo_saveOutput(MNLmodel.Ch.Exp.V1.Lin)

G.3. Syntax LCCM

###clear memory
rm(list = ls())

###initialise code
apollo_initialise()

###set core controls
apollo_control = list(
modelName = "LCCM",
modelDescr = "LCCM",
indivID = "ResponseId"
)

Vector of parameters, including any that are kept fixed in estimation
apollo_beta = c(BETA_dis_a = 0,
BETA_dis_b = 0,
BETA_dis_c = 0,
BETA_attr_a = 0,
BETA_attr_b = 0,
BETA_attr_c = 0,
BETA_thc_a = 0,
BETA_thc_b = 0,
BETA_thc_c = 0,
delta_a = 0,
delta_b = 0,
delta_c = 0
)

Vector with names (in quotes) of parameters to be kept fixed at their starting value in apollo_beta, use apollo_beta_fixed = c() if none
apollo_fixed = c("delta_c")

###define latent class parameters
apollo_lcPars=function(apollo_beta, apollo_inputs)

```
lcPars = list()

    lcPars[["BETA_dis"]] = list(BETA_dis_a, BETA_dis_b, BETA_dis_c)
lcPars[["BETA_attr"]] = list(BETA_attr_a, BETA_attr_b, BETA_attr_c)
lcPars[["BETA_thc"]] = list(BETA_thc_a, BETA_thc_b, BETA_thc_c)

    V=list()
V[["class_a"]] = delta_a
V[["class_b"]] = delta_b
V[["class_c"]] = delta_c

    classAlloc_settings = list(
classes = c(class_a=1, class_b = 2, class_c = 3),
utilities = V
)

    lcPars[["pi_values"]] = apollo_classAlloc(classAlloc_settings)

    return(lcPars)


    ###validate inputs
apollo_inputs = apollo_validateInputs()

    ###define model and likelihood function
apollo_probabilities=function(apollo_beta, apollo_inputs, functionality="estimate")

    ### Attach inputs and detach after function exit
apollo_attach(apollo_beta, apollo_inputs)
on.exit(apollo_detach(apollo_beta, apollo_inputs))

    ### Create list of probabilities P
P = list()

    ###define settings for MNL model component that are generic across classes
mnl_settings = list(
alternatives = c(alt1=1, alt2=2),
avail = 1, #list(alt1=1, alt2=2),
choiceVar = Choice
)

    ###loop over classes
for(s in 1:3)

    ###compute class-specific utilities
V=list()
V[["alt1"]] = (trav1.dis/1000) * BETA_dis[[s]] + trav1.attr * BETA_attr[[s]] + (trav1.thc/100) * BETA_thc[[s]]
V[["alt2"]] = (trav2.dis/1000) * BETA_dis[[s]] + trav2.attr * BETA_attr[[s]] + (trav2.thc/100) * BETA_thc[[s]]

    mnl_settings$utilities = V
mnl_settings$componentName = paste0("Class_",s)

    ###compute within-class choice probabilities using MNL model
P[[paste0("Class_",s)]] = apollo_mnl(mnl_settings, functionality)

    ###take product across observation for same individual
```

```
P[[paste0(”Class_”,s)]] = apollo_panelProd(P[[paste0(”Class_”,s)]], apollo_inputs ,functionality)


    ### Compute latent class model probabilities
lc_settings = list(inClassProb = P, classProb=pi_values)
P[[”model”]] = apollo_lc(lc_settings, apollo_inputs, functionality)

    ### Prepare and return outputs of function
P = apollo_prepareProb(P, apollo_inputs, functionality)
return(P)


    ###model estimation

    model = apollo_estimate(apollo_beta, apollo_fixed, apollo_probabilities, apollo_inputs)

    ###model outputs

    apollo_modelOutput(model)

    apollo_saveOutput(model)

    ###post processing

    apollo_sink()

    apollo_outOfSample(apollo_beta, apollo_fixed, apollo_probabilities, apollo_inputs)

    apollo_bootstrap(apollo_beta, apollo_fixed,apollo_probabilities, apollo_inputs)

    apollo_sink()

    conditionals = apollo_conditionals(model,apollo_probabilities, apollo_inputs)

    #### Class membership ####

    head(database)

    database$dubbel<-as.numeric(duplicated(database$ResponseId))

    Dplat<-subset(database, dubbel == 0)

    DS<-merge(conditionals3, Dplat, by.x = ”ID”, by.y = ”ResponseId”)

    library(nnet)

    m0<-multinom(cbind(X1, X2, X3)   Gender, data=DS)
m1<-multinom(cbind(X1, X2, X3)   Version, data=DS)
m2<-multinom(cbind(X1, X2, X3)   IncomePerYear, data=DS)
m3<-multinom(cbind(X1, X2, X3)   Age, data=DS)
m4<-multinom(cbind(X1, X2, X3)   Work_status, data=DS)
m5<-multinom(cbind(X1, X2, X3)   Education, data=DS)
m6<-multinom(cbind(X1, X2, X3)   Travel_company, data=DS)
m7<-multinom(cbind(X1, X2, X3)   Household, data=DS)
m8<-multinom(cbind(X1, X2, X3)   LivingEnvironment, data=DS)
```

predict(m0, newdata = data.frame(Gender = c(”Male”,”Female”)), type = ”probs”)
predict(m1, newdata = data.frame(Version = c(1,2)), type = ”probs”)
predict(m2, newdata = data.frame(IncomePerYear = levels(DS$IncomePerYear)), type = ”probs”)
predict(m2, newdata = data.frame(IncomePerYear = c(”Low”, ”Middle”, ”High”)), type = ”probs”)
predict(m3, newdata = data.frame(Age = levels(DS$Age)), type = ”probs”) predict(m3, newdata = data.frame(Age = c(”18-30”, ”31-50”, ”51-64”, ”65+”)), type = ”probs”)
predict(m4, newdata = data.frame(Work_status = levels(DS$Work_status)), type = ”probs”)
predict(m4, newdata = data.frame(Work_status = c(”Working (fulltime)”, ”Working (parttime)”, ”Other”, ”Student”)), type = ”probs”)
predict(m5, newdata = data.frame(Education = levels(DS$Education)), type = ”probs”)
predict(m5, newdata = data.frame(Education = c(”Low”, ”Middle”, ”High”, ”Other”)), type = ”probs”)
predict(m6, newdata = data.frame(Travel_company = levels(DS$Travel_company)), type = ”probs”)
predict(m6, newdata = data.frame(Travel_company = c(”Partner or friend”, ”Group of friends”, ”Kids”, ”Other”)), type = ”probs”)
predict(m7, newdata = data.frame(Household = levels(DS$Household)), type = ”probs”)
predict(m7, newdata = data.frame(Household = c(”Partner”, ”Kids”, ”With friends”, ”Other”)), type = ”probs”)
predict(m8, newdata = data.frame(LivingEnvironment = levels(DS.$LivingEnvironment)), type = ”probs”)
predict(m8, newdata = data.frame(LivingEnvironment = c(”(Middle) big city”, ”Small city or village”)), type = ”probs”)