RADBOUD UNIVERSITY NIJMEGEN

Nijmegen School of Management

TRANSITION TOWARDS LOW CARBON MOBILITY: RESEARCHING THE MODALITY CHOICE IN EUROPEAN PASSENGER TRANSPORT – AN AMSTERDAM-BERLIN CASE STUDY

Bachelor thesis Geography, Planning & Environment

Author:

Esther E. de Winter, s4611810

Supervisor:

Fariya Sharmeen

Second reader:

Jackie van de Walle

June 27, 2019

Blank page

TRANSITION TOWARDS LOW CARBON MOBILITY: RESEARCHING THE MODALITY CHOICE IN EUROPEAN PASSENGER TRANSPORT – AN AMSTERDAM-BERLIN CASE STUDY

ABSTRACT

The objective of this study is to provide more understanding of why passengers choose a certain mode of transport on international short-haul destinations (>700km). The case that is studied in this research is the connection between the Netherlands and Berlin and focusses on Dutch citizens. The main question is defined as: What is the relationship between the mobility preferences of passengers on the connection between the Netherlands and Berlin and their transport mode choice? The Theory of Planned Behaviour provides the theoretical basis, embedded in the new mobilities paradigm. To answer the research questions, the strategy consisted of a survey among travellers with the intention to go to Berlin, selected by a control question in the survey. The survey questionnaire was partly developed based on existing items and partly based on new items developed for this research. Contingency tables analysis, one-way ANOVA and descriptive statistics were used to study the relationship between the variables. Additionally seven interviews were held and analysed, using TPB-based document analysis method to provide deeper understanding of passengers' reasoning. Main findings were that indeed the behavioural attitude, subjective norm and perceived behavioural control hold a significant relation with the intended transport mode choice. From the passengers' perspective frequency of travelling and income also have an significant relation with the intended mode of transport. The four key modality characteristics to base a passenger's decision on, are total costs, travel time, travel comfort and environmental impact of the mode. Further research is necessary to determine the effect of place of residence and environmental impact of the mode.

EXECUTIVE SUMMARY

From 2018 onwards a lot of attention by the media has been given to the growing popularity for the train. Due to the CO_2 emissions involved in flying, the train has been put as *the* alternative for climate-friendly transport. However, the current railway situation in Europe is far from perfect. Various actors agree this needs improvement, but the process of improving transnational railways is a rough and it seems even transnational connections should mainly serve national interests. Also, there is little scientific knowledge on this topic available. Going back to the original goal, that of getting more passengers to take the train, this research aims to provide more understanding of why passengers choose a certain mode of transport on international short-haul destinations (>700km).

The case that is studied in this research is the connection between the Netherlands and Berlin and focusses on Dutch citizens. This connection is interesting, due to the lack of a high-speed railway connection, especially for this type of connections scientific knowledge is lacking. The main question is defined as: What is the relationship between the mobility preferences of passengers on the connection between the Netherlands and Berlin and their transport mode choice?

The Theory of Planned Behaviour provides the theoretical basis, embedded in the new mobilities paradigm. This means the socio-demographic variables of age, gender, place of residence and income are studied, as well as the type of passenger based on the frequency and purpose of travelling. Their behavioural attitude, subjective norm and perceived behavioural control is measured. Also the effect of modality characteristics is taken into account.

To answer the research questions, a case-study research design was chosen. The data collection strategy consisted of a survey among travellers with the intention to go to Berlin, selected by a control question in the survey. In total 184 respondents had completely filled out the questionnaire. The survey questionnaire was partly developed based on existing items and partly based on new items developed for this research. Respondents were found by spreading the survey as an online questionnaire to the Facebook groups 'Nederlanders in Berlijn' and a few student housing groups, because unfortunately other Facebook group related for example to expats in Berlin did not allow the post with the call for respondents. Contingency tables analysis, one-way ANOVA and descriptive statistics were used to study the relationship between the variables.

Within the survey people could leave their email address, in order to participate in an additional interview. Eventually seven interviews were arranged with a variety of passengers looking at age, travel mode preferences and place of residence. The interview guide was structured according to the concepts of the Theory of Planned Behaviour. The interview data was analysed, using a Theory of Planned Behaviour document analysis method. These schematic overviews of the interview provided deeper understanding of passengers' reasoning.

Looking at the socio-demographics, age showed to have an effect on the behavioural attitude towards the car and the bus. People belonging in the 28 or older group had a more negative attitude towards these modus compared to people aged 27 or younger. Also, gender displayed to affect the perceived behavioural control towards the airplane. Men were more likely to have a positive control perception of flying and women a more neutral control perception. For place of residence no significant relations could be determined. Income showed to be directly related to the intended travel mode choice. Passengers that would take the airplane had the highest income level, in between were the passengers that would take the train and the passengers with the lowest

income level would choose the bus. For the car users there was too much variance to determine any distinction. For the purpose of travelling no significant relationship was found. However, the frequency of travelling also displayed a direct relationship with the intended travel mode choice. Passengers that would intend to go by airplane would be more likely very frequent travellers, whereas passengers that would intend to go by bus would be more likely to be travelling just once.

For the concepts of the Theory of Planned Behaviour, behavioural attitude, subjective norm and perceived behavioural control, a significant relationships with the intended transport mode choice was found. Also, the intended transport mode choice had a strong relationship with the actual transport mode choice. Thus, the theoretic framework of the Theory of Planned Behaviour seems to be a valid for the case of the connection between Amsterdam and Berlin. The interviews revealed that, looking at perceived behavioural control, a specific barrier when planning a journey was found in the use of NSinternational, which is not structured to the liking of the passengers. Also, many peoples' environment consists of like-minded people, which partly explains the strong relationship between the subjective norm and the intended transport mode choice.

The four key modality characteristics to base a passenger's decision on, are total costs, travel time, travel comfort and environmental impact of the mode. Three of them, total costs, travel time and environmental impact of the mode, also had a significant relation with the intended travel mode choice.

Looking at the finding, several opportunities for further research could be found. First of all, the interviews revealed that place of residence is of importance, because it could be either be an important advantage or important disadvantage for certain travel modes. However, the data set of the survey did not show any significant relation for example with urbanisation level of the place of residence or with the adjacency of a train stop for the train from Amsterdam of Berlin. Also a lot of variance in the scores for the importance of the environmental impact of the mode could not be explained in the extent of this research. From the interviews it seemed that some people prefer not to take the airplane for environmental reasons, but they do not view the train as the best alternative right away. It seems that how the train is portrayed in the media as the best alternative for the airplane is not the complete picture. Besides, other theoretical imput could provide new, improved insights on this topic as well.

TABLE OF CONTENT

1 INTRODUCTION

1.1 Introduction

From 2018 onwards many Dutch newspapers and websites have written about the rise of international passenger rail transport. It seems that Dutch citizens more often choose to travel by train when going abroad (Bokkum, 2018, Eerenbeemt, 2018, Kraniotis, 2018, Hermanides, 2018). The Nederlandse Spoorwegen (NS) (Dutch railways) have also noticed this rise. They experienced a growth in number of passengers on their main international train routes; compared to the year before, their tickets sales to Berlin have risen by 9%, to Brussels by 12% and on the Thalys to Brussels and Paris by 6%. Not just NS, but also Treinreiswinkel, a dutch train travel agency, saw the number of customers rise by 30% over the year 2018 (Hermanides, 2018).

Several factors might provide an explanation for this growth in international passenger rail transport in 2018, but the main reason discussed in the media is the climate change debate, especially the debate about the concerns regarding the amount of CO2 emissions connected to flying. To illustrate this issue, for short-haul distances (<700km) the CO2 emission equivalent "well-to-wheel" per kilometre per person are more than 5 times higher for an airplane than for an intercity train. And, for high speed trains the CO2 emission equivalent per person per kilometre is even lower than that of a regular intercity train (Otten, Hoen & Boer, 2015, p.14). Thus, more people have started to view the (high speed) train as a reasonable, sustainable alternative to flying (Bokkum, 2018, Eerenbeemt, 2018).

This debate was reinforced by the doctoral thesis of Peeters on tourism in relation to climate change (2017). He concluded that drastic measures are needed to reduce CO2 emissions in tourism in order for it to become "climatically sustainable". A big reduction of the amount of flights is needed to establish this and, regarding the global nature of today's economy and its activities, a shift to more (high speed) rail is required. This is clearly illustrated by the following quote: "only a combination of extreme policy measures seems to be able to combine the climatically sustainable development of tourism (…).These policy measures cover (…) strong investment in high-speed rail" (Peeters , 2017, p.226). This conclusion should not only apply to the tourism sector, but also to business trips and other trips. Peeters' research received a great amount of media attention (Web editors TU Delft, 2017) which sparked the public interest to consider the train more often as a mode of transportation to foreign destinations (Bokkum, 2018, Eerenbeemt, 2018).

Next to the climate debate, there are other reasons why the popularity for train travel has grown. An important factor is that for some destinations the train is a faster option than flying, due to improved (high speed) railway connections, e.g. travelling from Amsterdam to Brussels (Kraniotis, 2018,

Omio, n.d.). Awareness of the fact that the train might also be a quicker option than flying has grown after the opening of the direct Eurostar route from London to Amsterdam (Hermanides, 2018).

Furthermore, Schiphol Airport wishes to expand, but the airport is not allowed to increase its number of flights. Thus plans are made to develop Lelystad Airport as a passenger airport to take over some of Schiphol's flights. However, this causes a lot of discussion within the Netherlands, since it is difficult to integrate the new flight routes within the busy Dutch airspace. This means that airplanes that would arrive and depart from Lelystad airport will have to fly at a lower height in the Dutch airspace to not conflict with the routes from and to Schiphol Airport. Consequently, airplanes will fly at a low level over the biggest nature reserve in the Netherlands: the Veluwe. Opponents fear environmental damage like noise and air pollution. The media discussion on this topic seems to negatively affect the image of flying as well as the public support for the expansion of Schiphol (Duursma, 2017, Duursma, 2019, Laconi, 2019).

Apart from the growing popularity of trains instead of airplanes, the aviation industry itself also wishes people to travel by train to short-haul destinations. As pointed out above, Schiphol Airport is operating at its maximum capacity, which means Schiphol has a restriction to grow. Together with KLM (Royal Dutch Airlines), Schiphol advocates for better international train connections to short haul destinations with the intention of replacing short haul flights with long haul flights, while still being able to offer a realistic alternative. This way Schiphol Airport could still develop as a hub and would b able to grow on the global level. In addition, long-haul destinations are more profitable than short haul ones (Duursma, 2018a, Eerenbeemt, 2018).

All of these issues, the concerns of CO2 emissions and the climate change debate, the improvements on some international railway connections, the establishment Lelystad Airport, and the eagerness of the aviation industry to integrate high quality railway connections with long distance flights, seem to have led to more awareness of the train as an alternative for short haul flight destinations. Thus, a new group of people seems to be willing to take a train (Bokkum, 2018, Eerenbeemt, 2018, Kraniotis, 2018, Hermanides, 2018). However, this new attention for the train was not only positive, but it was also met by criticism as the impossibilities of train routes through Europe became clear too (Kraniotis, 2018). A public debate emerged about whether the current state of rail infrastructure in Europe does indeed offer a realistic alternative to the airplane everyone is hoping for (Web Editors Volkskrant, 2018). This issue has not only been addressed in the media, but has also received attention in scientific literature recently: "low-carbon mobility measures substantially lags behind the potential."(Lah, 2015, p.4).

Accordingly, the Dutch government found itself motivated to improve the European train connections. In their recent strategic plan about public transportation in 2040, one section is devoted to international railway connections, stating the ambition to connect important Dutch cities to

important European cities by high quality railway connections. This should result in a comprehensive, seamlessly fitting European rail network (Ministerie van Infrastructuur en Waterstaat, 2019, p. 10). However, these ambitious goals come with many responsibilities that are not yet clearly divided between all actors (Kraniotis, 2018, Verlaan, 2019).

1.2 Research aims and questions

As explained in the introduction, various actors (NS, Prorail, Schiphol, KLM, Dutch ministry of water and infrastructure, Deutsche Bahn) have a stake to get more people to travel by train instead of the airplane. But despite the fact that all actors are in favour of the same goal, creating plans to achieve seems to result in a difficult process, especially when there no foundation of scientific knowledge. One specific international connection that has been under attention lately is that of the railway between Amsterdam and Berlin. Whereas other capitals close by – Brussels, Paris and London – have a high-speed railway connection, between the Netherlands and Berlin this one is a rather slow connection. The actors involved are seeking for ways to improve this and create a situation where the train is the most appealing option (Anderson, 2018, Donners, 2018)

Therefore, this research aims to provide a contribution to the knowledge on mobility preferences of passengers on short haul destinations in Europe. The case used to illustrate this is the connection between the Netherlands and Berlin. A high-quality railway connection is already established between other important destinations like Paris and London, but this is still not the case for the connection to Berlin. To many other European cities, such a high-quality railway connection is lacking. So, it is interesting to focus on these cases, which is why the connection between the Netherlands and Berlin is studied.

Although a small shift in modality from airplanes to trains is already taking place, it seems it is still necessary to identify the factors that play a significant role in transport mode choice on such connections. By identifying key preferences and criteria for international passengers on distances shorter than 700 km, a translation could be made into policy measures to attract more people to take the train. It is important to theorize this particular practice of travel mode choice, in order to understand the process as whole. All in all, this research aims is to create a better understanding of passenger's mobility preferences and the relationship with their transport mode choice on international destination within 700km like the connection between the Netherlands and Berlin.

To achieve the goal of this research, the central question will be as follows:

What is the relationship between the mobility preferences of passengers on the connection between the Netherlands and Berlin and their transport mode choice?

To answer the main question, the following sub-questions will be asked:

i. How does transport mode choice differ across the different types of travellers?

ii. What effect do socio-demographic variables have on transport mode choice?

iii. What effect does the passengers' behavioural attitude have on transport mode choice?

iv. What effect does the passengers' environment have on transport mode choice?

v. What effect does the passengers' perceived behavioural control have on transport mode choice?

vi. How do the modality characteristics affect the passengers' transport mode choice?

1.3 Scientific relevance

Looking into literature, only a few studies have been conducted on the topic of travel mode choice on short haul flight destination. One study is a Swiss study from in 2001 (Bieger & Laesser). They focussed on the variety of preferences and criteria of travellers on the connection between Bern and Paris. They found that the most important factors for the transport mode choice were safety, travel time, punctuality, flexibility, and travelling comfort. Factors like relaxation and productive use of time were marked as least important, probably because travelling is viewed as having a purpose on its own. However, due to debate on CO2 emissions of transport and the current development in popularity for the train their conclusions might be outdated. In addition there might be differences in preferences and criteria between Dutch and Swiss passengers when it comes to short haul destination.

In the same Swiss study (Bieger & Laesser, 2001) researchers pointed out that several criteria and preferences were not valued consistently by the panel. Some of the variance they found could not be explained by the preferences and criteria they studied. They suggested further research to find out whether significant differences existed between socio-demographic or psycho-demographic groups. This idea is in line with the new mobility turn, which suggests socio-demographic groups play an important role in mobility, because it influences the experience people have of mobility (Beyazit, 2013). Another study pointing out the knowledge gap is an exploratory study done by the Dutch consultancy firm Royal HaskonigDHV (Donners, 2018). This study examined the potential for train travelling in Europe as an alternative for (short-haul) flights. From a Dutch perspective they looked at connections

up to 1000 kilometres, so cities with a reasonable distance were selected. Forty cities were chosen from that selection and the current travel time by train was calculated. Also, the travel time for two improved alternatives was added in their model: an optimised network and a Europe-wide high speed rail network. For all these options, the relative amount of people choosing this mode of transport was calculated. Then, for the improved alternatives, the CO_2 emissions loss was calculated. They found out that an optimised network would result in a decline of 327 million kilograms CO_2 per year and an HSR network would result into a decline of 998 million kilograms CO_2 per year, since more travellers opted for the train.

Moreover, three interviews were held with three different types of travellers respectively, to find out which factors withhold them from travelling by train instead of by plane. The types of travellers they identified were business travellers, leisure travellers and frequent (leisure) travellers. For the business traveller, time and comfort are most important and the business traveller was rather sceptical about the train as an alternative. According to the article, this could be addressed by guaranteeing aspects that are important to the business traveller, e.g. a comfortable work space on the train. A big challenge when addressing this issue is that many business travellers do not book their own journey, so company culture needs to be shifted towards choosing railway transport over flying. The leisure traveller chooses the airplane out of habit. For this group, comfort and ease of travel are important. An approach that would address these issues are a marketing campaign focussing on the important aspects of a journey. The frequent traveller they interviewed did not consider the train at all as a modality, because air travel was the first option found by the interviewee, after which the traveller did not look at other options.. Many web pages only give information on different flights, but did not include other modalities for comparison. Marketing campaigns to create more awareness of train travel and creating better access to the information about train travel would address the frequent traveller habits. Another conclusion that counts for all travellers is that the ticket system and services should be improved. However, since this were only three exploratory interviews, further research was recommended to identify key criteria for the three different traveller types: business, leisure and frequent travellers.

In addition to the main part of the research a small case-study was conducted for the Amsterdam – Berlin railway. An optimised connection was established by changing to a locomotive compatible to both Germany and the Netherlands with a maximum speed of 250 kilometres per hour (applicable to a part of the track). Also the stops that were considered a regional hub instead of a long-distance hub were removed from the schedule, so the train would be more appealing as a long-distance connection compared to its current regional focus. This would result in a 46 minute time gain. However, these alterations are not considering any other factors, but are just showing the theoretically possible time-gain. According to the interviews more than just time plays a role while choosing a mode of transport, but the importance of all other factors are were not researched, since only 3 interviews were

held. It seems possible improvements were not yet tested on users of the Amsterdam – Berlin connection. They also mentioned that further research on improvements of the Amsterdam – Berlin connection should be done (Donner, 2018).

1.4 Societal relevance

The Paris Agreement of 2015 was the first global "legally binding global climate deal" (European Commission, n.d.). One of its main aspects is the objective of the mitigation strategy: reducing emissions to keep the global temperature increase since the pre-industrial area below 2°C (European Commission, n.d.). However, the transport sector is still a huge polluter. In Europe the transport sector is the biggest emitter of greenhouse gasses, even bigger than the power industry (Transport & Environment, 2016).

The reason for this is that transport is highly dependent on oil. Since the industrial age the average distance travelled per person has increased. Although the amount of time a person is willing to spend daily for travelling has remained the same over the decades between 0,8 - 1,2 hours (Givoni & Banister, 2018, Profillides & Botzoris, 2019, p. 8), the maximum speed at which a journey could take place has increased over the years, mainly through oil-dependent modernisation. Due to continuous innovations and increasing accessibility to (cheap) transportation, it is estimated that the distance on average travelled per person will continue to rise tremendously (Givoni & Banister, 2013). Yet, the transport sector is now under pressure to decarbonise in order to address climate change (Transport & Environment, 2016).

Transportation is one of the main products of tourism. Within tourism, especially aviation plays a big role in the amount of emissions produced. This takes into account both leisure and business trips. In order for tourism to decarbonize, the amount of flights should be reduced drastically. Policy strategies are necessary to achieve this, one of them being an extensive investment in high speed rail connections as an alternative to aviation (Peeters, 2017).

However, many train connections are not perceived as a proper substitution for the airplane by travellers (Eldering, 2018, Web Editors Volkskrant, 2018). To contribute to the mitigation measures necessary to address climate change, it is desirable that the train becomes a realistic alternative for aviation. Considering this, the Dutch government wants to invest in and stimulate the European train network (Duursma, 2018b). Outcomes of this research could contribute to improve the policy developments on this topic and thus generate more impact.

1.5 Research model

The first step in conducting research is to perform a literature review. This will provide the researcher with insights regarding the current scientific state of the research topic, and a greater awareness of the knowledge gap to be filled. Part of the literature review is to collect suitable theories and methodologies with which to research the topic (Vennix, 2011).

Simultaneously, a problem statement is developed (Vennix, 2011). The knowledge of the existing literature will be used to analyse the problem and establish
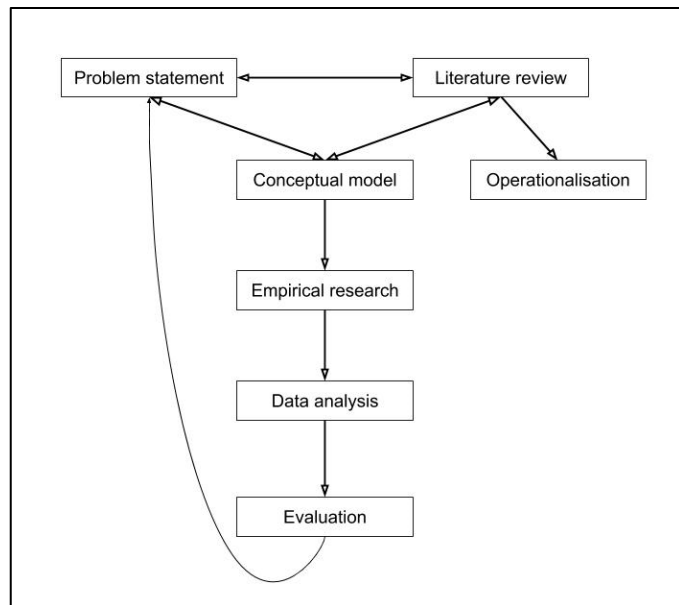
Figure 1: Research model as described in Vennix (2011)

a closing problem statement. Also the subjects to be researched will be defined; in the case of this research the subjects are Dutch residents with the intention to travel to Berlin. While doing literature review and describing a problem statement, the conceptual model is also created. An important part in this process is the operationalisation of the concepts to get to measurable indicators, which will be valid and reliable.

When the first stage of conducting a literature review and developing a problem statement and conceptual model are fulfilled, the main part of the research could be carried out. This is the empirical part of the research. For this research a survey will be carried out to collect data. Following on the research, the data analysis of this research will determine which preferences and criteria of travellers play a significant role in choosing a transport modality. The results will be compared with the theoretical framework (Vennix, 2011).

The final phase is the evaluation of the research. First of all conclusions will be drawn by answering the sub-questions and central question. Also a reflection on the research will take place in the discussion and lastly recommendations will be made for policy makers and further research (Vennix, 2011).

2 THEORY

2.1 Theoretical framework

2.1.1 Defining mobility & transport

Mobility is defined as an aggregation of "the total amount of travel that is undertaken on all forms of transport (Givoni & Banister, 2013, p. 2)." One important aspect of mobility is that it shows "the capacity of people to move from one place to another (Know & Marston, 2014, p. 113)." Mobility has a strong link to transport (Givoni & Banister, 2013, p.3); when being on the move the carrying of a person (or good) is defined as transport. At the point of arriving at its destination, the transport ends. Transport consists of three import elements: 1) The person or goods being transported, 2) the mode that realises the transport and 3) the infrastructure used by the mode (Profillides & Botzoris, 2019, p. 2)

2.1.2 The new mobilities paradigm

The new mobilities paradigm describes the current approach towards mobility in which this research is embedded. It was developed in the last decade to deal with the world-wide interconnectivity and increase in mobility. The term mobilities is defined by Urry (2007, p. 43, as cited in Beyazit, 2013) as "a wide array of economic, social and political practices, infrastructure and ideologies that all involve, entail or curtail various kinds of movement of people, or ideas, or information, or objects". The new paradigm goes beyond the boundaries of one discipline and gives a holistic insight of how mobilities could be perceived. For example, in this new paradigm, people are not just focussing on cost and time efficiency, like in more traditional transport research, but also on the experience that they attach to socio-spatial phenomena while performing an act of movement (Beyazit, 2013). Hence, the new mobilities paradigm is a useful approach for this research, since not only efficiency but also the experience of the transport mode seems to play an important role for the transport mode choice from the Netherlands to Berlin.

The new mobilities paradigm consists of five dimensions; practices, spaces, meanings, subjects, and politics. It reflects on these dimensions while on the move or standing still. All elements are related to each other. The dimension of practising mobility causes the creation of space that enables mobility, vice versa spaces that enact and provide mobility produce mobility.

The dimension of 'meanings' in this paradigm is about all kinds of associations that linked to the act of movement. The dimension of 'subject' is a bit more complex. On the one hand 'subjects' are related to mobility by combining spaces, practices and meanings. On the other hand this relationship is determined by the 'subject positions' – the societal groups a subject is part of, for example gender or class. These 'subject positions' cause an endless amount of experiences of mobility throughout society. Moreover these 'subject positions' cause an unequal relationship between subjects and mobility, some will experience themselves in a more privileged situation than others when performing an act of

mobility. At this point the dimension of 'politics' plays a role, since mobilities are to some extent always regulated, which has effect all the subjects in different positions and those regulations inevitably are only an advantage to some subjects (Beyazit, 2013).

One important position of the subjects is power, expressed in for example capital or status. It determines the capability of a subject to shape mobility and set norms. This principle not only reveals the power of a subject, a subject could also retrieve power from being able to move between two places. All in all, the dimension of subjects contributes to the mobility culture of a society (Beyazit, 2013).

Besides that, the mobility practises contribute to the mobility culture. Mobility practices are taking place by a certain mode of transport. The modes of transport shape the experiences of mobility and subjects allocate a certain meaning to a mode of transport. A distinction in experience could for example be based on the following: Some modes of transport are an act of personal performance, other modes of transport are an act done by others. Meaning, someone who drives its own car experiences a personal performance, whereas someone who takes the bus experiences it as an act done by others. Also the interaction with the scenery is different among various types of transport modes, for example in the underground one is not able to see the landscapes passing by, whereas someone on a bike could enjoy the landscape (Beyazit, 2013).

Transport policies are based on the dominant mobility culture in society and consequently about the dominant mode of transport. To establish a transition to low carbon mobility however, the existence of differences in mobility cultures should be acknowledged by transport policies to have an impact on mobilities as a whole (Beyazit, 2013).

The mobility culture of a society has a strong relationship with the 'modes of mobility governance'. On the one hand the governance is taking place within the context of a certain mobility culture, on the other hand the governance is shaping the mobility culture as it is part of 'politics'. This process of mobility governance constituting policies in line with the mobility culture and being the medium for this mobility culture, is called "structuration". Due to this structuration the system is subjected to path dependency (Macmillen, 2013).

2.1.3 Theory of planned behaviour

The theory of planned behaviour gives an insight into the underlying reasons people have for their behaviour or non-behaviour. This will provide the theoretic approach towards the behaviour of transport mode choice. It consists of three constructs. The first construct starts at the individual itself. A person has a certain attitude towards an act or behaviour. The behavioural attitude refers to whether a person thinks a certain act will be enjoyable and beneficial. For this research topic the attitude towards different transport modes is relevant; some transport modes will make more sense to someone than others (Ajzen, 1991).

The second construct of this theory is the subjective norm. This part of the theory explains that everything surrounding the individual, like a person's social network, will influence the attitude an individual has towards a certain act or behaviour. A person is aware of the norm surrounding them and this will influence the decision. The subjective norm consists of two parts: one is when the surroundings of a person are encouraging someone to do a certain act, the second is when the surroundings of a person are performing a certain act. Looking at modal choice, within certain social group mode X could have a higher status than mode Y, which will influence the decision of the individual (Ajzen, 1991).

The third construct is that of perceived behavioural control. When making a decision, an individual also will ask himself whether it is easy or hard to do a certain act or display a certain behaviour. A person could be more confident or capable of certain acts or behaviour than others. Thus this construct is about a person's own perception of being capable and confident about overcoming barriers to perform certain behaviour. If something is too far out of the comfort zone of the individual, this person will less likely choose that option. An example for travel mode choice is whether an elderly person still has the confidence and perceived capability of driving a car (Ajzen, 1991).

An act or behaviour with a positive outcome to all three constructs will more likely be chosen than one that has one or more constructs with an unfavourable outcome. The individual's attitude towards an act or behaviour, the subjects norm, and the perceived behavioural control will lead to the formation of a behavioural intention. Then, if the opportunity is there the behavioural intentional will lead to a specific act or behaviour (Ajzen, 1991).

2.2 Conceptual model & operationalization

Within social sciences a commonly used perspective on the relationship between concepts is that posited by Rosenberg. This perspective is built up out of three components: an individual's membership of social category, dispositions, and actions. In this perspective an individual has all kinds of measurable properties like gender, similar subject's positions as mentioned at the new mobilities paradigm. These socio-demographic properties result into certain dispositions, or feelings, or characteristics, or opinions. Then, these properties lead to a certain type of action, choice of behaviour. The dispositions in this research could be viewed as the three main elements of the Theory of Planned Behaviour: Behavioural attitude, subjective norm, and perceived behavioural control. In the context of this research, behavioural attitude means the passenger's opinion on the transport modes and its characteristics. The subjective norm entails the opinion and actions of the passenger's environment, and the perceived behavioural control are the barriers a passenger experiences for using a certain mode of transport. The last concept of the intended action or behaviour is the intended transport mode (Ajzen, 1991, Punch, 2003).
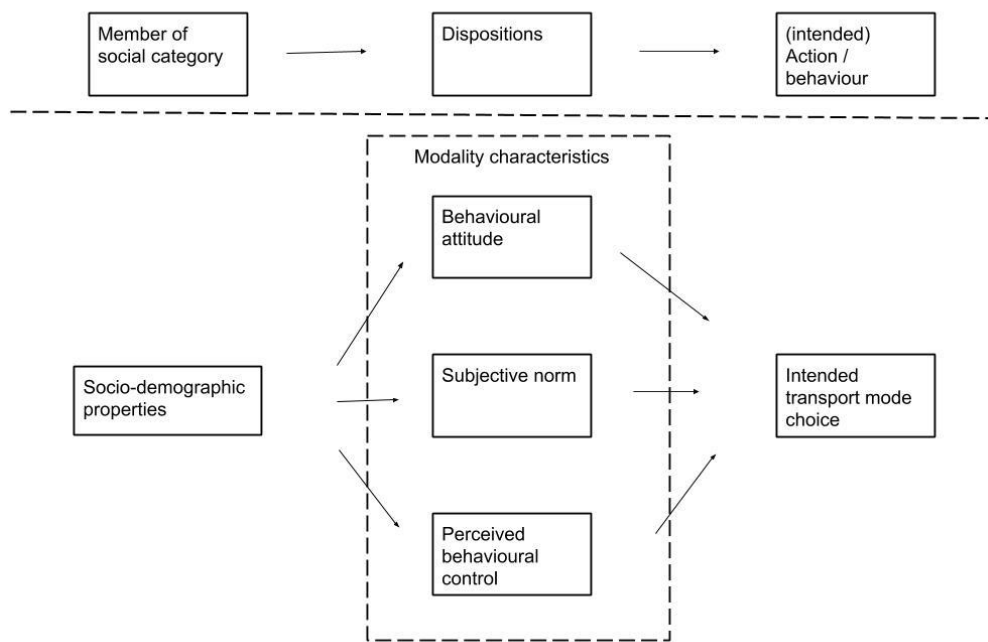
Figure 2: Conceptual model

The following table provides an overview on how the sub-questions for this research will be answered. Sub-questions one and two are related to the subject's positioning. Sub-questions three and six are related to the behavioural attitude. Sub-question four is related to the subjective norm and sub-question five to the perceived behavioural control. The survey outline and the interview guide are attached in Appendix A and B.

Table 1: Operationalisation of the sub-questions

Sub question	Indicators	Answered by:	Survey questions	Interview questions
i. How does transport mode choice differ across the different types of travellers?	Frequency of travelling, purpose of travelling	Literature, survey, interviews	2, 3, 5, 6	1, 2
ii. What effect do socio-demographic variables have on transport mode choice?	Gender, age, place of residence, income	Literature, survey, interviews	18, 19, 20, 21	1

iii. What effect does the passengers' behavioural attitude have on transport mode choice?	Enjoyable aspect of the mode, reasonable aspect of the mode	Literature, survey, interviews	9, 10	4, 5, 10
iv. What effect does the passengers' environment have on transport mode choice?	Opinion of the passengers' environment, influence of the passengers' environment	Literature, survey, interviews	11, 12, 13	6, 7, 11
v. What effect does the passengers' perceived behavioural control have on transport mode choice?	Perceived difficulty of using a certain mode, accessibility of information, ease of planning the journey	Literature, survey, interviews	14	8, 9, 10
vi. How do the modality characteristics affect the passengers' transport mode choice?	Travel time, punctuality, total costs, frequency of the connection, amount of changes, stress during the journey, travel comfort, relaxation, time to be productive, environmental impact, safety, familiarity with the mode, possibility to call/ use the internet.	Literature, survey	8, 16	-

2.3 Hypothesis

The expectations of the first sub-question derive from the exploratory study performed by Royal Haskonig DHV (Donners, 2018), for which three interviews were held among three different kinds of travellers. Although just three interviews were held, it was hypothesized that the purpose and frequency of travelling affect the choice of transport mode.

The expectations of the second sub-question derive from the ideas of the new mobilities paradigm (Beyazit, 2013) and the research performed by Bieger & Leasser (2001). Both suggest specific

socio-demographic characteristics affect the experience of passengers of a transport mode, which will lead to different modality preferences.

The expectations of sub-questions three until five derive from the Theory of Planned Behaviour (Ajzen, 1991). A positive attitude towards a certain mode of transport, a stimulating environment towards a certain mode of transport and a feeling of capability and confidence to use a certain mode of transport will increase the intention of using that mode of transport. It assumes that this intention of using transport mode X will lead to actually using transport mode X. This theory forms the hypothetical basis for the outcomes of sub-questions iii – v.

The expectations of the sixth sub-question derive from the study performed by Bieger & Leasser (2001). They looked into the importance of the attitude towards modality characteristics and concluded that most important mobility characteristics were safety, travel time, punctuality, flexibility and travelling comfort and least important factors were relaxation and productive time use. However due to the environmental debate it will be interesting to see to what extent this element is valued and another factor, the possibility to internet and call, is expected to play a role nowadays. In 2001 this was not much of an issue.

3 METHOD

3.1 Research strategy

The first decision that needs to be made while choosing the research method is the research strategy. The strategy for this research is a holistic single case-study design. There is one unit of analysis within the case: travellers with the intention to go to Berlin. The case is unique on its own, when looking at the geography of the case. There are no similar connections like the one from the Netherlands to Berlin based on the distance, the countries and the modality options. For example the distance to Brussels and Paris is much less, and the train is a much faster option. Also the case is in itself interesting, due to the societal importance and scientific knowledge gap. In that sense the connection between the Netherlands and Berlin is an intrinsic case (Cresswell, 2013).

Another reason to go for a case-study research design is because of the important contemporary context regarding this case. The public debate about climate change is an important incentive for people to switch to taking the train as transport mode. The case is researched within its bounded system, like time and place (Cresswell, 2013). By using a case-study research design a comprehensive evaluation of travel mode choice from the Netherlands to Berlin will be formed given the current situation. Other types of research design do not emphasize the particular context.

A case-study research design requires multiple sources of information (Cresswell, 2013). Information for this case-study is collected in three ways: continuous desk-research on the development of this topic, a cross-sectional survey among 222 Dutch citizens that (have the intention to) travel on the connection between the Netherlands and Berlin and 7 interviews to provide more in-depth understanding of reasoning behind specific choices. The case is thus approached in both a quantitative and qualitative way. The quantitative method is an obvious choice for this case, since it would meet the goal of the research, which requires statements that are generally applicable to this connection. The interviews will provide on the other hand deeper understand of different reasoning behind choices, which can't be measured with a quantitative survey.

It is a conscious choice to not go for a survey research design, since this assumes that its outcomes are possible to generalise to a broader context (Vennix, 2011). However, this does not apply to this research, since, as mentioned above, the case is unique and the outcomes will not apply to situations that are not within the context of this case. The geographic attributes of the connection from the Netherlands to Berlin will very much determine the results of this research. Thus, a quantitative oriented case-study applies better to the situation given. Within the context of this case though, the results of the survey could be generalised and have a strong reliability due to its quantitative focus.

Also, a qualitative research design has not been chosen, since it would only focus on giving in-depth insights of reasoning behind factors of someone's actions. A quantitative approach would focus

more on the relationship between the different variables that will determine someone's action (Punch, 2003). The quantitative approach serves the aim of this research better: developing a better understanding of which factors significantly play a role in travel mode choice from the Netherlands to Berlin. Thus, this demands for a quantitative approach.

3.2 The Amsterdam - Berlin case

From the Netherlands, Berlin is an interesting destination for a city trip, and a corridor to get to other European destinations such as Poland and the Czech Republic (Donners, 2018). Between 2006 and 2016, the amount of trips made by Dutch citizens to Berlin varied between 197.000 and 348.000. Thus, Berlin is one of the most popular destinations for Dutch citizens, behind Paris and London (Centraal Bureau voor de Statistiek, 2017).

Currently the trip takes approximately 6,5 hours for about 650 kilometres. Both Dutch and German actors are interested in improving this connection, to make it more competitive with flying (Bockxmeer, 2017, Andersen, 2018, Klaus & Heeg, 2018). Especially the NS has been very clear about its plans to improve the connection, since the NS stated to aim to double the amount of passengers on the train to Berlin to obtain 30% of the market share for this connection(Web Editors NS, 2018).

In September 2018 all actors agreed on creating a plan to improve the connection, but the policy making process for the Amsterdam-Berlin rail connection is a difficult one (Anderson, 2018). A complicating aspect is the transboundary characteristics of this international railway connection. Actors on both sides of the border take in account their (national) interest and have to consider their national legislation. Thus planning for railway networks is currently done mainly in favour of the national situation. This is especially clear for the Amsterdam-Berlin train, which currently serves national needs next to the international needs, which explains the fourteen in-between stops. The main problem that is caused by all these stops, is the amount of time adding up from all these stops to a significant amount of time loss, slowing down the connection. However, none of the cities want to lose their stop, thus at the moment the train serves the aim of a regular intercity (Donners, 2018).

Additionally, a technical issues causes a 10-minute stop at the border to change to a locomotive that is compatible with the other country's electric current. It is calculated that when the stops at all regional hubs would be removed and the technical situation would be improved around 46 minutes would be gained (Donners, 2018). Yet, this is not the substantial gain of time that NS is hoping for; they would like to see a reduction of at least two hours to incite more passengers to choose the train. The question remains where improvements should take place, apart from travel time.

Besides the train and the airplane, other reasonable modes of transport between the Netherlands and Berlin are by car or long-distance bus service. CO2 equivalent per kilometre per person are still lowest when travelling by train, as compared to travelling by car or bus (Otten, Hoen & Boer,

2015). Travel time does not seem to be a factor travelers take into account when choosing their mode of transportation on this journey: taking a train is not slower than travelling by car or bus, so other advantages draw people to take these latter two options.

3.3 Data collection strategy

3.3.1 Survey

Due to the limited resources that are present for this research, the survey for this research is a small-scale survey which results in a restricted size and scope of this research. However, this is tackled by choosing a focused distribution and a cross-sectional type of surveying. (Punch, 2003).

There are various ways possible to distribute a survey: one core distinction is choosing an online or face-to-face way of surveying . The survey of this research is held as an online questionnaire to be able to reach out to a broad scope of individuals with an intention to travel to Berlin. The distribution channels used had a high likelihood of addressing respondents with an intention of travelling to Berlin, without specific biases connected to them, i.e. it was not distributed to channels with a focus on especially railway transport or airplanes. The survey was distributed mainly via Facebook groups with Dutch members that frequently visit Berlin (Nederlanders in Berlijn) and student housing groups (SSHN Hoogeveldt, SSHN Proosdij). Unfortunately various groups with for example expats in Berlin didn't allow the call for respondents in their group, thus the additional student housing Facebook groups were chosen to distribute the survey on.

The survey of this research is cross-sectional, which means that there is only one moment in time a measurement will take place. The call for respondents took place between the 2nd to the 23rd of May 2019. An advantage of this strategy is that all respondents could use an anonymous link to fill out the survey, because they will not have to be contacted again for a follow-up survey later in time. If the survey would be longitudinal then the same data would be collected over several points in time, in order to answer questions on changes over time (Punch, 2003). However, the cross-sectional approach serves the aim of this research, because there is no time dimension present in the aim.

To focus even more specifically on respondents with the intention to travel between the Netherlands and Berlin, a control question is added to the start of the survey. This questions filters whether people have travelled on the connection between the Netherlands and Berlin recently or have plans to do so in the near future. It is an important aspect to only select people that have the intention to travel on this connection, since the issues that are part of planning this journey are familiar to them, whereas people that do not have the intention to travel on this connection might not know yet what would be important for them when choosing a specific transport mode. People that do not meet the criteria are not directed to the actual questionnaire of the survey. This way a panel of passengers with the intention to use this connection is formed.

The design of the survey is important to obtain valid and reliable data (Vennix, 2011). Most important are the size and the time to complete the survey to maximize the survey completion rate (Punch, 2003). The predicted duration of the survey is 7,5 minutes, which is still less than nine minutes which is the point when a substantial increase in survey break-offs is found (Qualtrics Support, n.d.). Partially the survey questions of two former researches could be used (Bieger & Laesser, 2001, Bamberg, Ajzen & Schmidt, 2003), partially the items had to be developed for this research specifically.

To improve the validity and reliability of the survey, it was pilot tested beforehand (Punch, 2003). The pilot test was held among three persons that have travelled to Berlin before 2018. With the limited amount of resources, it would already take effort to find a panel of passengers for the actual surveying that travelled on the connection given the restriction of between 2018 and 2020 and an extra panel that could pilot test the survey would not be possible. Improvements were focussed on the clarity of the questions and the structure of the survey. Additionally, the survey was evaluated by an experienced researcher.

3.3.2 Interviews

It is not a common practise to use the Theory of Planned Behaviour for qualitative strategies like interviewing, but this issue is addressed in the paper of Renzi and Klobas (2008). The interview guide for this research was developed based on their approach to the Theory of Planned Behaviour and suggestions on how to develop an interview guide accordingly. All elements of the theory were represented in one or more questions (also shown in table 2). Additional questions were asked about potentially interesting socio-demographic variables (see Appendix B).

The interviewees were found by using the survey. At the end of the survey people that would be willing to participate in an interview could leave their contact details. Among these people, a variety of passengers were selected, with different travel mode preferences and other attributes, like age and place of residence. Thus, a broad perspective of ideas could be addressed in the interviews.

3.3.3 Desk research

Along with the empirical research more literature on the specific subtopics is researched. irst of all, this included data from the Dutch statistics agency CBS to check the representativeness of data. Also, they publish an annual report on tourism trends. These trends provide a larger overview of what is going in the Dutch tourism sector, which is information that could be used for the first two research questions (Centraal Bureau voor Statistiek, 2018).

3.4 Research material

The unit of analysis in this research are individuals with the intention to travel from the Netherlands to Berlin. This has been operationalised to individuals who travelled to Berlin in 2018 or 2019 or who have

planned a trip to Berlin in 2019 or 2020. The choice for 2018 has come about from the rise in interest regarding train travel since 2018 as a mode for travelling to Berlin. This means a group of people who first would have chosen another mode of transport, now view the train as the best mode of transport. The year 2020 has been chosen, since this is a reasonable term on which people might have already planned a trip to Berlin. The panel was selected this way with a control question asking whether they have travelled between the Netherlands and Berlin in 2018 or 2019, or whether they are planning to travel to Berlin in 2019 or 2020.

The total amount of completely filled out questionnaires is 184. 38 Persons partially completed surveys. All surveys were completed via an anonymous link, so sending a reminder was impossible. From the 184 completely filled out responses 111 respondents were female and 70 were male. Three respondents stated not to specify their gender. The age of the respondents ranges between 17 and 68 years old and their place of residence varied throughout the whole of the Netherlands and Germany (Appendix C).

In total seven interviews were held. All interviewees have travelled to Berlin more than once and at least once in the period between 2018 and 2020. The ages of the respondents varied between 25 and 68 years old.

Looking at the survey, it is clear that females are a bit overrepresented in the dataset with 61% of the individuals who indicated their gender. In contrary to the Dutch population in which just a bit more than 50% of the population is female. Besides, younger people are represented more than older people, because the average age in the dataset is 27,8 years, whereas this is 41,8 in the Netherland (Centraal Bureau voor de Statistiek, 2018). Two things could explain this: Firstly the fact that the survey was distributed on Facebook, a medium on which older people are less active. Secondly, the fact that the survey was also distributed on channels with many students involved.

The average annual income in the dataset is 24.685, this is just a little lower than the average of 28800. The reason for this is the overrepresentation of younger people in the dataset, as the income of this group tends to be lower than average (Centraal Bureau voor de Statistiek, 2018c)

3.5 Data analysis

3.5.1 Survey

The survey data was analysed using SPSS. The first step was to check the complete dataset by using descriptive statistics and see whether all data was correctly recorded. These descriptive statistics also show the variance of the different variables in the dataset (Punch, 2003). After checking the data, the correct indicators were computed, if necessary. For example the variable of behavioural attitude was measured in two items, so for behavioural attitude one score was calculated. Also, the subjective norm was measured in three items: one about the passenger's environment's own choice, one about the

passenger's environment's recommendation and one about the passenger's environment's opinion (Appendix A). The modus of these three questions was calculated as the subjective norm the passenger is exposed to. On the other hand, the perceived behavioural control was asked in just one item and didn't need any computing.

Furthermore, the indicator which determines the type of traveller, travel frequency, was computed as an aggregation of the amount of time that a passenger has travelled on the connection between the Netherlands and Berlin in 2018 untill May 2019 and the amount of times a passenger is planning to travel until 2020. The socio-demographic variable that needed transformation was the place of residence, which was measured as postal code. This was recoded in to municipality. By using the CBS data on urbanisation level this level was added as a new variable, as well as a dichotomy variable that tells whether the municipality of residence has a train station in which people could board the train to Berlin.

Then, in line with the conceptual model and research questions, the statistical tests were carried out. Due to the categorical nature of transport mode choice, for the relationship with other categorical data the main method of analysis is contingency tables, using Chi-Square tests to test the hypothesis and the Cramer's V coefficient to check the effect size. The interpretation of the Cramer's V in this research is explained in the table 2 below (Akoglu, 2018, University of Toronto, n.d.). For relationship with transport mode choice and the continuous variables one way analysis of variances between groups were carried out. This shows how the variances across the continuous variable is related to the categorical data. If the test results were significant, post hoc testing showed for which groups a significant difference counted. To choose the right post hoc test the Levene's test for homogeneity of variances was used and the N per group in order to choose the most robust post hoc test (Field, 2018, Punch, 2003).

Table 2: interpretation of Cramer's V

Cramer's V score	Description of effect size interpretation
0,00 to 0,10	Very weak,
0,11 to 0,20	Weak
0,21 to 0,25	Moderate
0,26 to 0,30	Moderately strong
0,31 to 0,40	Strong
0,41 or higher	Very strong

3.5.2 Interviews

The interviews were recorded in order to create a transcription of them. The interviews were summarised (Appendix E) and used to reflect on the outcomes of the statistical tests. This means that the variables tested were also examined in the interviews and this will provide more in-depth information on how the relationship between two variables looks like. To do so, of all interviews a summarising table is made, in which all relevant findings could be found, according to the suggestions made by Renzi & Klobas (2008). The relevant topics summarised in the tables are: Socio-demographic information, Most preferred travel mode choice, Advantages and disadvantages of the mode, Opinion on the other modes, Subjective norm, Information access and ease of planning.

4 RESULTS

In this chapter all findings from the survey and interview analysis are presented. The key results of the survey are displayed in this chapter and supporting results could be found in Appendix D. Also, for the interviews the best illustrating quotes are reported in this Chapter and a more elaborate overview could be found in Appendix E. In this Appendix also the original quotes could be found, since all quotes are originally in Dutch and are translated to English by the researcher in this chapter.

This Chapter follows the structure of the conceptual model, firstly the effect of the properties of the passenger is reported on, followed by the effect of the modality characteristics. Then the three components of the Theory of Planned Behaviour are described and lastly the results will be depicted on whether the intended mode choice is associated with the actual mode choice.

4.1 The effect of different types of passengers

4.1.1 Frequency of travelling

The first distinction that could be made between passengers is how often they travelled on the connection studied. In table 3 below the frequency of travelling is an aggregation of the amount of times a passenger has been travelling between 2018 and May 2019 and the amount of times that a passenger has planned to travel until 2020. This is divided among passengers that intend to go by either the airplane, the train, the car or the bus. By looking at the descriptive statistics, the assumption arises that indeed frequency and the intention to take a certain transport mode are related to each other.

Table 3: Descriptive statistics – travel frequency * the intended transport mode

	N	Mean	Std. Deviation	Std. Error
Airplane	34	8,4706	8,86339	1,52006
Train	109	4,3578	5,02129	,48095
Car	23	6,7826	7,61551	1,58794
Bus	18	2,7778	4,02281	,94819
Total	184	5,2663	6,38901	,47100

By performing the analysis of variances, the test results to be significant at the 0,05 level, see table 4. This means at least one of the travel mode groups differs significantly from another group on their travel frequency.

Table 4: ANOVA – Travel frequency * intended travel mode choice

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	603,410	3	201,137	5,273	,002
Within Groups	6866,541	180	38,147		
Total	7469,951	183			

Subsequently, a post hoc test will tell which groups differ. The Levene's test of homogeneity in table 5 results in a significant result, which means the following for post hoc testing: the Games-Howell non-parametric test is the best choice to tackle the heterogeneity of variances.

Table 5: Test of Homogeneity of Variances – travel frequency * intended travel mode choice

		Levene Statistic	df1	df2	Sig.
Travel frequency between 2018 - 2020	Based on Mean	5,638	3	180	,001

The post-hoc test (see Appendix D) shows which groups differ significantly from one another. It shows that the two groups that have a significant difference on travel frequency of the passenger are the passengers using the airplane compared to the passengers using the bus. Passengers that use the airplane tend to be more frequent travellers than passengers that use the bus. No significant differences could be determined between the other groups.

Travel frequency could also be analysed as categorical data. To do so, contingency tables are used to perform the analysis. First, the frequency categories have to be defined. The frequency categories that have the strongest relation with the transport mode choice are 1) once, 2) 2 to 5 times, 3) 6 or more times. This counts for the time period of 2018 until 2020. For these categories the Chi-Square is significant at the 0,05 level and the effect size, Cramer's V, is 0,225, which means there is a moderate relationship present between the travel frequency categories and the intended mode of transport choice (see table 6 and 7). The cells that significantly differ from each other are again of the groups that take the airplane or the bus (see Appendix D). The assumption of at least 80% of the cells with an expected count of more than 5 is met (Field, 2018). Frequency of travelling is thus directly related to the transport mode choice. For other distribution of frequencies to the categories the Cramer's V only became smaller, e.g. for a distribution of once, 2-4 times and 5 or more times.

Table 6: Chi-Square Test – travel frequency * intended travel mode choice

	Value	df	Asymptotic significance (2-sided)
Pearson Chi-Square	18,709a	6	,005
N of Valid Cases	184		

a. 1 cells (8,3%) have expected count less than 5. The minimum expected count is 4,70.

Table 7: Cramer's V – travel frequency * intended travel mode choice

	Value	Approximate Significance
Cramer's V	,225	,005
N of Valid Cases	184	

Looking at the interviews, many frequent travellers are not very flexible and they are not planning much months in advance. Thus, the airplane is in the experience by the interviewees the most affordable and quickest option to get to Berlin on a short notice. For example, if the journey is supposed to take place in the evening after work, in the experience of Toon Savelkoul, travelling several times per year, the airplane is the only option: "Sometimes I'm travelling after work in the evening, then I'm actually only able to take the airplane (see Appendix E)." Also for Arthur Augustijn, travelling on a monthly notice, views the airplane as the best option: "actually, recently I have only been travelling with the airplane, I know it is bad… but it is so much quicker (See Appendix E)."

4.1.2 Purpose of travelling

The categories developed for the survey on the purpose of travelling are: private/holidays, business, both or else. For the purpose of travelling, no significant relations are found between intended travel mode choice, behavioural attitude, subjective norm and perceived behavioural control. Thus, the results do not confirm the hypothesis that the purpose of travelling determines the transport mode choice according to this data.

One of the possible reasons for this is that among the respondents that went to Berlin in 2018 until May 2019, only three answered to travel as business travellers, 125 respondents said to be travelling for leisure reasons and 38 for a combination of both leisure and business reasons. Thus business travellers are not represented well in the dataset. From one of the interviews with a passenger that has a business motive to travel, it became clear that business travellers build up a social life in Berlin as well, so reaching out to solely business travellers didn't work out. He said that usually he also stays over in Berlin for the weekend, in order to meet up with friends (see Appendix E).

4.2 The effect of socio-demographic variables

4.2.1 Gender

Analysing the relationship of gender with the intended transport mode choice shows no significant results. Also, gender is not related to the variable of behavioural attitude, subjective norm and the modality characteristics. However, gender is related to the perceived behavioural control for the transport mode of the airplane at the significance level of 0,05, as shown in table 8. The effect size of the relation is, looking at the Cramer's V score of 0,216, moderate. Men have a more positive perception of the ease of planning a trip with the airplane, whereas women are more neutral (see Appendix D). For the train and the bus the results are not significant at the 0,05, but the results are approaching this level really closely, the significance is 0,070 and 0,053 as shown in tables 9 and 10 respectively.

Table 8: Chi-Square Test – Gender * perceived behavioural control airplane

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8,459ª	2	,015
N of Valid Cases	181		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 11,22..

Table 9: Chi-Square Test – Gender * perceived behavioural control train

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5,322ª	2	,070
N of Valid Cases	180		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 5,75.

Table 10: Chi-Square Test – Gender * perceived behavioural control bus

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5,892ª	2	,053
N of Valid Cases	178		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 10,85.

4.2.2 Age

Age is not found as a significant predictor for intended modality choice. However, age has a significant relationship with the behavioural attitude of the modalities of car and the bus, see tables 11 and 12. For this analysis age is recoded as categorical data: youth (17-27 years old) and adults (28+ years old). The choice for 27 derives from several reports of CBS, in which the definition of youth varies between a maximum of 25 until 35 (Centraal Bureau voor de Statistiek, n.d.) and the fact that 27,8 the average age in this dataset is (Appendix C), so this is taken as splitting point. Looking at the car, adults have a more negative attitude towards the car compared to youth. Also, for the bus the behavioural attitude of adults is more negative than that of youth. The strength of the association measured is moderate, as Cramer's V scored respectively 0,225 and 0,222 (see Appendix D).

Table 11: Chi-Square Test – age * behavioural attitude car

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8,895ª	2	,012
N of Valid Cases	176		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 8,44.

Table 12: Chi-Square Test – age * behavioural attitude bus

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	9,043[a]	2	,011
N of Valid Cases	183		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 5,51.

Besides, the modality characteristic of 'total costs' significantly relates with the age (table 13). For youth the total costs turn out to be very important whereas adults indicate it to be moderately important (see Appendix E). The options of unimportant and slightly important are combined together, because nearly any respondent picked either of these options and having more than 20% of the cells with an expected count of less than 5 will affect the reliability of the Chi-square test (Field, 2018). The effect size of this relation is according to the Cramer's V value 0,312 as table 14 shows, which means the strength of the relationship is strong.

Table 13: Chi-Square Test – age * total costs

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	17,945[a]	3	,000
N of Valid Cases	184		

a. 1 cells (12,5%) have expected count less than 5. The minimum expected count is 2,48.

Table 14: Effect size – age * total costs

	Value	Approximate Significance
Cramer's V	,312	,000
N of Valid Cases	184	

4.2.3 Place of residence

The place of residence could be divided between municipalities with a boarding station for the train from Amsterdam to Berlin and municipalities without a boarding station for the train from Amsterdam to Berlin. Differences in intended transport mode choice, behavioural attitude, subjective norm and perceived behavioural control between those two groups is either not significant or the assumptions of the tests are violated to a great extent affecting the reliability of the tests. Also, no significant relationship with any modality characteristics is found.

The place of residence could also be categorised as very strongly urbanised, strongly urbanised, moderately urbanised and weakly urbanised/not urbanised according to the CBS categories (Appendix G). The last category is a combination, since in the Netherlands and in my survey data not many places are defined as not urbanised, which lead to very few respondents living in a non-urbanised municipality.

For the level of urbanisation, no significant relations were found with the intended transport mode choice, behavioural attitude, subjective norm and perceived behavioural control. No significant relationship is also found with any modality characteristics.

Despite the insignificant results, from many interviews it became clear that place of residence does play a role. On the one hand, the place of residence could be an advantage for a transport mode, because the train or bus station is close by. Bram van Mondfoort says that he is living near Amsterdam Central Station, so this comes in handy when taking the train (see Appendix E). Also Joost Nussy explains he is only living on a 10-minute cycling distance from the Flixbus stop, which is convenient (see Appendix E).

On the other hand, place of residence could become a disadvantage, when a station is far away and going to the station takes a significant amount of time. Arthur Augustijn explains that the train takes too much time, among others due to the time it takes to get on the train to Berlin "The travel time [with the train] is just too long to Berlin, because the journey takes at least six, no seven hours from Rotterdam (see Appendix E)." Similarly, for Nicolle Wolvenne the time it takes to get to an airport is too long, she explains that she thinks it such a hassle to travel all the way to the airport (See Appendix E).

4.2.4 Income

When looking at income from table 15 of the descriptive statistics of income divided in intended travel mode choice groups, the assumption arises that passengers choosing a certain transport mode differ on the variable of income.

Table 15: Descriptive statistics – annual income * intended transport mode choice

	N	Mean	Std. Deviation	Std. Error
Airplane	30	40483,3333	35414,00544	6465,68321
Train	80	20752,5000	14412,42410	1611,35800
Car	14	25524,6429	27134,95549	7252,12190
Bus	13	12276,9231	8901,13793	2468,73148
Total	137	24756,5328	23332,36489	1993,41846

This idea is confirmed by the analysis of variances, which gives a significant result (table 16). To check which groups exactly differ from each other post hoc testing is necessary. Since the homogeneity of variances test gives a significant result as well, see table 17, the most robust test to choose is the Games-Howell test.

26

Table 16: ANOVA – annual income * intended transport mode choice

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10735438411,298	3	3578479470,433	7,518	,000
Within Groups	63302859766,804	133	475961351,630		
Total	74038298178,102	136			

Table 17: Test of Homogeneity of Variances – annual income * intended travel mode choice

		Levene Statistic	df1	df2	Sig.
Annual income	Based on Mean	7,393	3	133	,000

The Games-Howell post hoc test shows several results (see Appendix D). Passengers that intended to fly have a significant higher income level than train or bus users. Passengers that intend to use the train have a significant higher income level than bus users and a significant lower income level than people that fly. Naturally, the income level of bus passengers is significantly lower than that of people that fly or go by train. However, passengers that use the car do not have a different income compared to all the other modes.

4.3 Passengers' behavioural attitude

According to the Theory of Planned Behaviour, people that have a positive attitude towards a certain behaviour, would also be more likely to perform that behaviour (see Theory). From the data of the survey, the hypothesis that a positive attitude towards the airplane would also lead to more intention of choosing the airplane is confirmed by a significant result of the statistical test presented at table 18 (also see appendix D).

The hypothesis is confirmed as well for all other modes of transport the train, the car and the bus, as illustrated in tables 19, 20, and 21. The strength of the relation between the behavioural attitude towards airplanes and transport mode choice is the Cramer's V value of 0,331, for the behavioural attitude towards the train this is 0,237, for the behavioural attitude towards the car this is 0,230 and for the behavioural attitude towards the bus this is 0,374. Thus, the relationships range from a moderate to strong association. Although the results are in line with the theoretically base for this analysis, the results for the train, car and bus violate one the assumption. At least 80% of the expected count should be greater than 5. So, the interpretation should be done with caution and instead of the chi-square, the likelihood ratio needs to be significant, which it is.

Table 18: Chi-Square Test - Behavioural attitude airplane * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	39,256a	6	,000
N of Valid Cases	179		

a. 2 cells (16,7%) have expected count less than 5. The minimum expected count is 3,52.

Table 19: Chi-Square Test – Behavioural attitude train * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	20,448a	6	,002
Likelihood Ratio	18,619	6	,005
N of Valid Cases	182		

a. 6 cells (50,0%) have expected count less than 5. The minimum expected count is 1,09.

Table 20: Chi-Square Test – Behavioural attitude car * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	18,613a	6	,005
Likelihood Ratio	24,458	6	,000
N of Valid Cases	176		

a. 4 cells (33,3%) have expected count less than 5. The minimum expected count is 2,61.

Table 21: Chi-Square Test: behavioural attitude bus * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	51,251a	6	,000
Likelihood Ratio	54,660	6	,000
N of Valid Cases	183		

a. 4 cells (33,3%) have expected count less than 5. The minimum expected count is 1,77.

4.4 Modality characteristics

The modality characteristics taken into account in this research are travel time, punctuality, total costs, frequency of the connection, amount of changes, stress during the trip, travel comfort, relaxation, time to be productive, environmental impact, safety, familiarity with the mode, and possibility to call/ use the internet. In table 22, the sum of the three most important factors which the respondents base their transport choice on are displayed. On average, a characteristic could be chosen 43 times. According to this table it seems that total costs, travel time, travel comfort and environmental impact of the mode

are chosen more than average. The least important factor is the possibility to call / use the internet, which was opted only 7 times.

Table 22: Sum of the three most important factors of a transport mode

	Sum
Total costs	129
Travel time	107
Travel comfort	77
Environmental impact of the mode	63
Stress during the trip	38
Familiarity	30
Relaxation	27
Amount of changes	25
Punctuality	17
Frequency of the connection	16
Productive use of time	15
Safety	10
Possibility to call / use internet	7

Looking at the four most important factors, the environmental impact has a significant relation with the behavioural attitude towards the airplane, see table 23. Passengers with a positive attitude towards the airplane are more likely to value the environmental impact as unimportant and passengers with a negative attitude towards the airplane are more likely to value the environmental impact as important (see Appendix D). The relation between importance of environmental impact and behavioural attitude towards the airplane is moderately strong (see Appendix D).

Table 23: Chi-Square Tests – importance environmental impact * behavioural attitude

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25,246[a]	8	,001
N of Valid Cases	189		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 6,43.

Besides environmental impact of the mode, the other three main important characteristics did not have a significant relationship with behavioural attitude. However, a direct relationship between the total costs, travel time and environmental impact is determined with the intended transport mode choice at a significance level of 0,05 as shown in tables 24 until 26. One assumption is violated, that of a maximum of 20% of the cells with an expected count less than five, so the likelihood ratio is looked at. The effect size of all relations is moderate. The cross tabulations show a relationship between people who intend

to take the bus and their value for travel time. Also, it shows a relationship between people who intend to take the airplane and their value of the total costs and a relationship between people that intend to take the train and how they value the environmental impact of the mode (see Appendix D).

Table 24: Chi-Square Test – total costs * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25,869[a]	12	,011
Likelihood Ratio	25,621	12	,012
N of Valid Cases	184		

a. 11 cells (55,0%) have expected count less than 5. The minimum expected count is ,29.

Table 25: Chi-Square Test – travel time * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25,737[a]	12	,012
Likelihood Ratio	21,090	12	,049
N of Valid Cases	184		

a. 9 cells (45,0%) have expected count less than 5. The minimum expected count is ,29.

Table 26: Chi-Square Test – importance environmental impact * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	34,475[a]	12	,001
Likelihood Ratio	34,678	12	,001
N of Valid Cases	184		

a. 9 cells (45,0%) have expected count less than 5. The minimum expected count is 3,13.

Moreover, within the interviews the topics of travel time, travel cost and the environmental impact of the mode came up many times when talking about the advantages and disadvantages of certain transport modalities. About environmental impact Yvette Schuijt for example says: "Well, the car is not really sustainable, but the airplane is worse (see Appendix E)." Joost Nussy and Sip Grafhorst also take environmental impact in consideration. However, this results mainly in an argument against flying and not in an argument in favour of train travel.

Travel time also plays an important role for many of the interviewees. Usually, their most preferred mode is also the quickest or one of the quickest ways to travel to Berlin, based on their place of residence. If the travel time is taking a several or more hours, it is preferred to be possible to make use of that time. Two examples illustrate this, for Joost Nussy this means the night bus is a reasonable option, because the night is used for travelling and for Bram van Montfoord a working Wi-Fi connection is required on the train in order to be able to work during the journey (see Appendix E).

Total costs are also playing an important role in the interviews, in all seven interviews costs was part of the reason to use or not use a certain transport mode. From the interviews of Bram van

Montfoord, Yvette Schuijt, Nicolle Wolvenne, Joost Nussy, Arthur Augustijm, and Sip Grafhorst it becomes clear that booking train tickets on a last-minute notice is usually seen as expensive. As Yvette Schuijt shortly explains: "The train is really relaxed. But often it is really expensive, especially when booking tickets last-minutes (See Appendix E)."

Furthermore, a striking detail is that although the travel mode of flying is associated with a higher income level, when booking at this last-minute the interviewees experience the flights as more affordable. Arthur Augustijn explains that he could book flight tickets for about 120 euros one week before departure, whereas this for the train usually around 170 euros is. Hence, total costs of last-minute booking for flights are less.

4.5 Perceived behavioural control

One of the concepts within the Theory of Planned Behaviour is the perceived behavioural control. Looking at the results in tables 27 until 30, the hypothesis that the perceived behavioural control has a significant relation with the intended transport mode choice could be adopted. However, for the perceived behavioural control of the airplane, the train and the car the assumption of less than 20% of the expected count to be less than 5 is violated. So, the results should be interpreted with caution and the likelihood ratio instead of the Chi-square should be used. In many of the cases, it seems from the cross tabulation that a positive perceived behavioural control towards a mode leads to a higher chance of intending to choose this option and vice versa. The effect sizes vary between moderate to strong (Appendix D).

Table 27: Chi-Square Test – perceived behavioural control airplane * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	22,077[a]	6	,001
Likelihood Ratio	28,365	6	,000
N of Valid Cases	184		

a. 4 cells (33,3%) have expected count less than 5. The minimum expected count is 2,93.

Table 28: Chi-Square Test – perceived behavioural control train * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	47,415[a]	6	,000
Likelihood Ratio	41,996	6	,000
N of Valid Cases	183		

a. 6 cells (50,0%) have expected count less than 5. The minimum expected count is 1,48.

Table 29: Chi-Square Test – perceived behavioural control car * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	19,979[a]	6	,003
Likelihood Ratio	25,160	6	,000
N of Valid Cases	178		

a. 3 cells (25,0%) have expected count less than 5. The minimum expected count is 2,70.

Table 30: Chi-Square Test – perceived behavioural control bus * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25,709[a]	6	,000
N of Valid Cases	181		

a. 2 cells (16,7%) have expected count less than 5. The minimum expected count is 2,88.

The interviews provide more insight in actual the barriers experienced and information accessibility involved when opting for one of the modes. The main issues which is standing out, are the amount of complaints on the web page of NSinternational. For example, Bram van Montfoord explains: "It just does not work properly, compared to web pages of airlines." For Bram van Montfoord the general structure of the web page does not make sense and the structure of many web pages of airlines are way easier to grasp. On the web page of NSinternational, one has to select a lot of things, whereas basic things, as a specific time selection is not possible. Also, Toon Savelkoul explicitly describes his experiences with NSinternational: "What is truly annoying in my opinion is to book tickets at NSinternational, such a badly organised web page." Toon Savelkoul elaborates that he misses the option to select a certain seat. Additionally, a few interviewees pointed out that the price for train tickets at NSinternational is experienced as in transparent, because the prices differ when booking at NSinternational or Deutsche Bahn, as Sip Grafhorst clarifies: "To find affordable train tickets is actually really hard. Apparently, it also seems that when booking at NS they offer different prices than at Deutsche Bahn." To the contrary, planning a flight, a bus or car-trip is experienced as rather easy.

For the bus, Joost Nussy points out that during the trip one needs a flexible mind-set. The bus could be late without getting a notification about the exact delay. Besides, the Wi-Fi on board could be malfunctioning, although they promise to have working Wi-Fi. Also, the exact location of the Flixbus stop and the in-between stops could be not indicated precisely, until you have booked your ticket.

4.6 Subjective norm

The subjective norm, one of the concepts of the Theory of Planned Behaviour, is measured by three items that focus on the actions of the passengers' environment, the recommendation of the passengers' environment and the opinion of the passengers' environment. To provide a reliable measurement, it needs to be tested whether the items measure the same variable. The test for this is the Cronbach's

Alpha, which scores a 0,844 value in this case (Table 31). Since, the aim is to have a Cronbach Alpha higher than 0,7, all three items could be included in the analysis. The measurement is on a nominal scale, so the way of selecting the subjective norm from the tree items is by using central tendency is the modus.

Table 31: Reliability Statistics – subjective norm

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,844	,847	3

The test whether the intended transport mode choice and the subjective norm are dependent on one another turns out to be significant on the 0,05 level, see table 33. However, the assumption of a maximum of 20% of the cells with a count less than 5 is violated, so the significance level of the likelihood ratio is of importance. This value is significant. The effect size of this relation is very strong, namely the Cramer's V value is 0,520, see table 34 (FIELD). Whenever the norm is to take a certain transport mode, this transport mode is chosen more often over other modes, see table 32.

Table 32: Subjective norm * intended travel mode choice

			Intended transport mode choicee				Total
			Airplane	Train	Car	Bus	
Subjective norm	Airplane	Count	19$_a$	23$_b$	2$_b$	1$_b$	45
		% Column	59,4%	22,3%	9,5%	6,3%	26,2%
	Train	Count	11$_a$	71$_b$	11$_{a, b}$	3$_a$	96
		% Column	34,4%	68,9%	52,4%	18,8%	55,8%
	Car	Count	2$_a$	6$_a$	8$_b$	0$_a$	16
		% Column	6,3%	5,8%	38,1%	0,0%	9,3%
	Bus	Count	0$_a$	3$_a$	0$_a$	12$_b$	15
		% Column	0,0%	2,9%	0,0%	75,0%	8,7%
Total		Count	32	103	21	16	172
		% column	100,0%	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Welke vervoermiddel kiest de respondent hoogstwaarschijnlijk categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 33: Chi-Square Test – subjective norm * intended travel mode choice

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	139,575a	9	,000
Likelihood Ratio	88,733	9	,000
N of Valid Cases	172		

a. 7 cells (43,8%) have expected count less than 5. The minimum expected count is 1,40.

Table 34: Cramer's V – subjective norm * intended travel mode choice

	Value	Approximate Significance
Cramer's V	,520	,000
N of Valid Cases	172	

Conversations on the topic of subjective norm led to the understanding that many passengers are similar minded as their own environment, which means that they are not convinced by their environment to take a certain transport mode, because they already share the same opinion on this topic. Some interviewees experience flight shaming, whereas others do not experience this at all. For example, Bram van Montfoord explains that he does not like to talk about taking a flight it with certain groups of friends, whereas Toon Savelkoul experiences no judgement on that issue "but I have never really experienced any comments like oh are you taking a flight again? You could have gone by train." The occurrence of flight shaming was depending on the group of people with whom one was getting along (see Appendix E).

Also, Nicolle Wolvenne experiences judgement from her environment for taking the car to Berlin. "I have also got people, who think it is not OK that we always go everywhere by car. Some say that actually we should go by train." However. she also pointed out that those opinions do not really matter to her and that others in her environment like to take the car as well (see Appendix E). This last statement also counts for the other interviewees, who all know other people take prefer the same option as they do.

4.7 The intended action and the actual action

According to the Theory of Planned behaviour an intended action will also lead to this certain specific action. This could also be tested in the with the data, since respondents had to tell at first which transport mode they have travelled with in 2018 until May 2019, then at the end they would tell which travelled mode they were intended to choose when they would plan a new journey. The relationship between these two variables is significant at the 0,05 level as shown in table 35. Besides, also the Cramer's V score is exceptionally high at 0,601, see table 36, this means that it might be the case that both of the variables are measuring the same. In this case, that is a good thing, since the presumption of Theory of Planned Behaviour presumes is true and the intended behaviour is a predictor for the actual behaviour.

Table 35: Chi-square test – Intended transport mode * actual transport mode between 2018 and May 2019

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	176,649[a]	12	,000
Likelihood Ratio	138,482	12	,000
N of Valid Cases	163		

a. 11 cells (55,0%) have expected count less than 5. The minimum expected count is 1,38.

Table 36: Cramer's V – Intended transport mode * actual transport mode between 2018 and May 2019

	Value	Approximate Significance
Cramer's V	,601	,000
N of Valid Cases	163	

5 CONCLUSION

The main question this research aims to answers is:

> What is the relationship between the mobility preferences of passengers on
> the connection between the Netherlands and Berlin and their transport mode
> choice?

In order to answer the main question, first the answers on the sub-questions will be elaborated on.

i.   *How does transport mode choice differ across the different types of travellers?*

Travellers are distinguished based on two factors: their frequency of travelling and their purpose of travelling. For the frequency of travelling, a direct relationship with the intended travel mode choice is found. Travellers that intended to take the airplane are more likely to travel more frequent than travellers that intended to take the bus. When looking at dividing travellers into groups based on travel frequency, the three groups with the strongest relationship with intended travel mode choice are: once, 2-5 times and 6 or more, considering a time span of 2018 – 2020.

Based on the purpose of travelling, no significant relationship with the intended travel mode choice, modality characteristics or the concepts of the theory of planned behaviour could be determined.

ii.   *What effect do socio-demographic variables have on transport mode choice?*

For this research four socio-demographic variables were researched: gender, age, income and place of residence. Looking at gender, a relationship was found with the perceived behavioural control for the airplane with a moderate strength. Men turned out to be more positive about the ease of planning a trip with an airplane, whereas women turned out to be more neutral.

For age, a relationship between the behavioural attitude of the car and bus was determined. In both cases youth (aged 17 to 27) had a more positive approach towards these mode of transport between the Netherlands and Berlin than adults (aged 28 to 68). This relationship has a moderate effect size.

The concept of place of residence didn't led to any significant results. Two factors were looked at: urbanisation level of place of residence and whether this place had a boarding station of the train between Amsterdam and Berlin. By looking at the interviews, it became clear that the place of residence plays a role, but is a more complex one. On the one hand it could be an advantage and on the other

hand a disadvantage for certain modes, because the location of someone determines whether it is hard or easy to use a certain modality.

Lastly, annual income was looked at and a direct relation with the intended modality choice was found. The group that would choose for the airplane had the highest level of income and differed from the group that would take the train or the bus. The group that would choose the train was in between and had a lower income than the people that chose the airplane, but higher than the group that would choose the bus. The group that would just the bus had the lowest average income. For all these modes of transport no significant difference was found for the group that would choose the car, because the variance of this group average was highest.

iii.   ***What effect does the passengers' behavioural attitude have on transport mode choice?***

For all the transport mode categories, a significant relationship was determined between the behavioural attitude towards the mode and the intended mode of transport. The strongest relationship was found for the bus, then for the airplane and lastly for the train and the car, which effect sizes were only slightly different. So, when passengers have a positive attitude towards a certain mode, they will more likely intended to choose this mode.

iv.   ***What effect does the passengers' environment have on transport mode choice?***

The opinion and actions of the passengers' environment is called the subjective norm to which a passenger is exposed to. The items used for the survey to measure this were evaluated as consistent, so all of them could be used to perform the analysis. The relationship between the subjective norm and the intended transport mode was significant and very strong.

From the interviews it got clear that a passenger's own environment usually is likeminded and that in reality it is not like the environment is actively encouraging to perform a certain behaviour. To some degree, a few interviewees received judgements on taking a flight or the car for their environmental impact, which for them meant that whenever they would fly, they rather not discuss it. However, others were not experiencing this at all and it seemed to be depended on the group of people.

v.   ***What effect does the passengers' perceived behavioural control have on transport mode choice?***

The results from the survey on the relationship between perceived behavioural control and the intended transport mode was significant for all transport modes considered in this research: the airplane, the train, the car and the bus. This relationship was moderately strong.

On this topic in the interviews, one remarkable pattern came up. The web page of NSinternational was perceived as badly structured and user-unfriendly, whereas for the other modes no significant barriers were perceived for planning a trip.

vi.   How do the modality characteristics affect the passengers' transport mode choice?

Passengers could choose their three most main factors that they would base their decision for transport mode on. The four main reason stated were total cost, travel time, travel comfort and environmental impact of the mode. Within interviews also travel time, travel costs and environmental impact of the mode were emphasised as important factors to base a decision of modality on, especially travel time and total costs were coming up at all of the interviews.

From these four characteristics, environmental impact of the mode had a significant relationship with the behavioural attitude towards a mode, namely that of the airplane. More people than expected based on coincidence would not choose the airplane, when they found environmental impact of the mode an important factor and vice versa. This relationship was relatively strong. Besides, for travel time, travel costs and environmental impact of the mode a significant relationship with travel mode choice was found.

WHAT IS THE RELATIONSHIP BETWEEN THE MOBILITY PREFERENCES OF PASSENGERS ON THE CONNECTION BETWEEN THE NETHERLANDS AND BERLIN AND THEIR TRANSPORT MODE CHOICE?

From the conclusions on the sub-questions now the main question could be answered. All the concepts from the Theory of Planned Behaviour play a significant role in the decision of transport mode. This means the attitude, environment, and confidence and capability have an effect on likelihood to intending to use a specific mode.

One striking result from the interviews on the concepts of Theory of Planned Behaviour is that the web page of NSinternational is perceived as badly structured, whereas for the other mode planning the trip is perceived as rather easy. Also, of the three concepts the subjective norm holds the strongest relationship with the intended transport mode choice, but the environment one is exposed to is usually likeminded.

Besides, the frequency of travelling has a significant effect on which mode one would choose, whereas this could not be determined for the purpose of travelling. The airplane, which is usually considered as quickest option, is also most popular among travellers that have a high frequency of travelling. From the socio-demographic variables income also holds a direct relation with transport mode choice. Passengers with a higher income level are more likely to take an airplane, in-between people would more likely take the train and people with a smaller income would opt the bus more often.

For the car, such relationship could not be determined, because there was a lot of variance in the income level of car users.

The four main reasons from the survey on which passengers base their decision of transport mode are total cost, travel time, travel comfort and travel environment. From the interviews it seemed mainly total costs, travel time and environmental impact are the key factors to base a decision on, which got confirmed by significant survey results for a direct relationship with the intended mode of transport. Environment holds a moderately strong relation with the behavioural attitude towards the airplane.

Some socio-demographic variables also affect the behavioural attitude and the perceived behavioural control. Age, divided in youth (ages 17 – 27) and adults (ages 28 – 68), had the following effect on behavioural attitude: Adults were more likely to have a negative attitude towards car of bus use compared to youth. Gender played a role when looking at perceived behavioural control. Men had a more positive perception on the ease of taking a flight, while women were more neutrally minded about this.

To conclude, mobility preferences from the passenger him- or herself, the environment one interacts with, and the perception on the ease of using this mode are all of importance when choosing a transport mode on the connection from the Netherlands to Berlin.

6 DISCUSSION & RECOMMENDATION

6.1 Interpreting interesting results

One would expect after reading the introduction that it would be possible to find a relation between the passengers opinion of environmental impact of the mode with the behavioural attitude of the train. However this relation was not significant and from the interviews it seems that people that view the environment as an important factor do not want to use the airplane in particular. Despite the fact that in the media it is said the train is *the* alternative to the airplane, passengers sometimes also opt for the car or bus. In the interviews this was made clear, because sometimes the best option based on other factors, when consciously not taking the airplane for environmental reasons, was to use the car or bus. This option was environment-friendly enough them. This is supported by the result that the importance of the environmental impact of the mode *has* a significant relationship with the intended travel mode and more people than expected would choose to go by train when they find the environmental impact important of very important.

Another interesting result to point out is the strong relationship between the subjective norm and the intended transport mode. From the interviews it got clear that this relationship is most likely based on the fact that many people get along with likeminded people, which means that the opinion on matters like this are similar. Most of the times people are not so much challenged by other people's opinions. This only happens for the few who experience flight shaming from certain groups of friends, which means that they reject taking the airplane for environmental reasons. However, the interviewees that experienced this, just preferred not talking this topic over with their friends or relatives.

Looking at perceived behavioural control, it is interesting to see that the accessibility of the Dutch web page for booking international trains, NSinternational, is considered user-unfriendly. Many people experience web pages of airlines as way easier to use. This means that the barrier for taking a train is already there when trying to book a ticket, which might result in less people taking the train eventually.

Lastly, the four characteristics that were considered as most important, the total costs, travel time, travel comfort and environmental impact of the mode, are somewhat in line with the findings of the research by Bieger and Leasser (2001). In their research also travel time and travel comfort were distinguished as key factors. In their research environmental impact of the mode was not taken into account and total costs might have a greater effect in this research, because the respondents' average age was quite young and the average income was below the Dutch average. On the other hand, people from Switzerland might also be looking less at pricing compared to Dutch passengers.

6.2 Reflection

The theoretical framework of this research is mainly depending on the Theory of Planned Behaviour. This is a widely used theory in the field of travel mode choice, but a reflection on other behavioural theories would have enhanced the development of a more comprehensive conceptual model. The research is now embedded in the new mobilities paradigm, the Theory of Planned Behaviour and the research by Bieger & Leasser (2001) and looking at this topic from a greater variety of perspectives could have led to more, strengthened findings. More time to conduct this research would have enabled the researcher to study other possible theoretical approaches.

The case-study strategy served the aim of the research well. The results clearly caused a better understanding of the case. The data collection strategy of both a survey and interviews complimented each other and the combination of results strengthened the conclusion that derived from the findings.

Two restrictions were found on the process of data collection. The first one was the indicator of purpose of the trip, which was for this research divided into two groups: leisure, business, both or else. This did not lead to any significant relations, because nearly all respondents said to be travelling either for leisure, for leisure and business or with other reasons. This division didn't seem to work out well and for any further research a better division might be business, holiday, healthcare, family & friends, school & sport, passing through, which is the division according to CBS (2018).

The second indicator was the income. The survey was an online questionnaire to which all the fields were marked as obligatory field. This meant that people who didn't want to fill out their income had to fill in something random. Another problem was that it was not specified as gross national income, so the researcher received a few reactions of confused respondents what kind of income they had to fill out. Still, after checking the data and removing the random answers such as 1234512345 or 00, the income data seemed distributed as expected, keeping in mind the average age of the respondents is quite young. However, these measures resulted in many missing values, affecting the reliability of this indicator. Due to limited resources, the pilot testing of the survey had not taken place among a bigger panel, which would have made this error clear.

Looking at the data set, it was still not containing as much respondents as desirable. Due to the nominal nature of transport mode choice, a lot of statistical test with a Chi-Square were performed. However, to use this test bigger datasets are desired, because of its assumption of at least 80% of the expected counts to be 5 in order for the test to be most reliable. Difficulty is that some option are rarely applies to someone. This also means that some of the tests performed in this research, this assumption had to be violated. This violation was tackled by using the likelihood ratio instead of the Chi-Square, however the reliability is still affected. A bigger dataset overcome this problem.

The data collection of the interviews was a smoother process. An important detail it that all interviews were held with frequent travellers; none of the interviewees had only travelled once. This

might explain why they were willing to participate in an interview. An advantage was that all of the interviewees were very familiar with the journey and the possible modes and had a well-established idea on their travel mode choice. A disadvantage is the missing perspective of a passenger that has only travelled once and their process of travel mode choice.

The results in this research has a strong foundation in cross tabulations. This enables to find relationships between variables, but it is not controlling for, for example, socio-demographic variables when looking at the other concepts. Due to the limitation of time, no comprehensive model was established to analyse the concepts all together.

6.3 Further research

Although place of residence didn't lead to significant results with intended transport mode in this research, from the interviews it still became clear as an important factor to base the decision of transport mode on. For example from an interviewee from Groningen it was most logical to take the bus, since there is a well-established bus connection to Berlin from there. Whereas from interviewee from places near a train station with the train-service to Berlin, this was considered a serious alternative. On the other hand if either a bus stop or a train station with a direct service to Berlin weren't close-by, these option were considered less important. For the train this didn't just counted for the direct train to Berlin, but also for the train to Duisburg or Düsseldorf, to change in Germany to a train to Berlin. Thus, it seems that a complex relationship might exist with the transport mode choice and place of residence. For this a further research is necessary. This could be used as a guideline in which places a train stop on the way to Berlin should still be made and which stops could be removed in order to fasten the train.

The importance of environmental impact of the mode has a lot of variance, which was not researched in this study. However, it seems an interesting factor on its own to study, since it effects travel mode choice and many people view it as one of the three main reasons to base their travel mode choice on.

Besides the place of residence and the environmental impact of the mode, also other theoretical approaches could be used to look at transport mode choice on international destinations within 700 kilometres. This could lead to a more complete understanding of this and other cases. This could also challenges the results of this research, strengthening the theory-building of this niche in transport mode choice. Additional model building would also lead to more comprehensive knowledge of this particular practise.

6.4 Policy recommendation:

Looking at the type of traveller based on the frequency of travelling a significant relation was found for transport mode choice. More specifically that most frequent travellers tend to take the airplane and

least frequent travellers tend to take the bus. But, the train did not seem to attract very frequent travellers and to increase the amount of people that travel with the train on the way from the Netherland to Berlin, focussing on the frequent travellers will be of importance. To make choosing to go by train a more appeal option, new strategies could be worked out to get more frequent, last-minute passengers on board.

Besides, the web page of NSinternational clearly needs to be improved. At first the page in which one could choose their travel details (to where, when, passenger details) needs to be simplified, since it was viewed as annoying on all the steps that you need to go through in order to get to the page with the travel option. Then, at the booking form more option need to be added, for example one seating options.

Although it was not revealed from the survey, several interviewees also pointed out the importance of the well-functioning Wi-Fi connection on the train to be able to work during the trip. This viewed as necessary to compensated for the time loss compared to flying. Another measure pointed out in the interviews, was the pricing of the flight tickets. Several interviewees were in favour of the introduction of a flight tax.

From the results of the subjective norm it becomes clear that choosing a transport mode depends on the passenger's own environment. This means that whenever a group of people is proponent of one mode, members of that group will more likely choose this mode. However from the interviews it was clear they do not really feel pushed into this decision, because they view a certain mode as most logic to take as well, just like their environment. Focussing policy on what is important for people who are taking the other modes of transport, for example for car users flexibilities like in the train one could also bring whatever luggage they would like as well would be most effective to that group.

Moreover, travel time is indicated in both the survey as the interviews as a very important aspect to base travel mode choice on. In order to get more people on the train a significant reduction of the travel time to Berlin is truly necessary. Currently, some of the interviewees explain that it is alright to take the airplane, because from their point of view the train is not a realistic alternative, looking at the travel time. The current, time-consuming train ride from the Netherlands to Berlin is viewed as an excuse to not choose the train. As long as passengers have more concerns than just the environmental impact of the mode, travel time of 6,5 to 7 hours compared to an hour flight will always be an issue. However, many interviewees also state that a significant reduction in time would equalize the amount of time needed to fly and to go by train, which would enable more people to rethink their options.

7 LITERATURE

Akoglu, Haldun. (2018). User's guide to correlation coefficients. *Turkish Journal of Emergency Medicine* 18 (3). DOI: 10.1016/j.tjem.2018.08.001

Andersen, R. (2018, September 17th). In vier uur naar Berlijn treinen is technisch haalbaar, maar een politieke kwelling. *Volkskrant.* Via: https://www.volkskrant.nl/nieuws-achtergrond/in-vier-uur-naar-berlijn-treinen-is-technisch-haalbaar-maar-een-politieke-kwelling~bf5b1444/ at: 05/03/2019

Ajzen, I. (1991). The theory of planned behaviour. *Organisation behaviour and human decision processes* 50 (2), 179-211. DOI: 10.1016/0749-5978(91)90020-T

Bamberg, S., I. Ajzen, P. Schmidt (2003). Choice of Travel Mode in Theory of Planned Behavior. The Roles of Past Behavior, Habit and Reasoned Action. *Basic and applied social psychology*, 25(3), 175–187. DOI: 10.1207/s15324834basp2503_01

Beyazit, E. (2013). Mobility Cultures. In M. Givoni & D. Banister (Ed.), *Moving towards low carbon mobility.* 15-25

Bieger, T., C. Laesser, (2001). The role of the railway with regard to mode choice in medium range travel. *Tourism Review,* 56 (1, 2), 33-39. DOI: 10.1108/eb058354

Bockxmeer, J. van (2017). Grensregio's willen snellere trein Amsterdam-Berlijn. *Duitsland Instituut.* Retrieved from: https://duitslandinstituut.nl/artikel/20761/grensregios-willen-snellere-trein-amsterdam-berlijn at: 05/03/2019

Bokkum, M. van (2018, June 6th). Iedereen heeft het ineens over reizen per trein. *NRC.* Retrieved from: https://www.nrc.nl/nieuws/2018/06/06/iedereen-heeft-het-ineens-over-reizen-per-trein-a1605682 at: 28/02/2019

Centraal Bureau voor de Statistiek (2017). *Vakanties naar Parijs op laagste punt in 10 jaar.* Retrieved from: https://www.cbs.nl/nl-nl/nieuws/2017/13/vakanties-naar-parijs-op-laagste-punt-in-tien-jaar at: 09/06/2019

Centraal Bureau voor de Statistiek (2018a). *Deel 2 van het trendrapport tourisme, recreatie en vrije tijd 2018.*

Centraal Bureau voor de Statistiek (2018b, October). Bevolking; kerncijfers [Data file]. Retrieved from: https://opendata.cbs.nl/statline/#/CBS/nl/dataset/37296ned/table?ts=1561458282897 at 24/06/2019.

Centraal Bureau voor de Statistiek (2018c, December 11th). Inkomensverdeling. Retrieved from: https://www.cbs.nl/nl-nl/visualisaties/inkomensverdeling at 24/06/2018

Centraal Bureau voor de Statistiek. (2018d, February). Gebieden in Nederland 2017; Grootte en

stedelijkheid van gemeenten [Data file]. Retrieved from:

https://opendata.cbs.nl/statline/#/CBS/nl/dataset/83553NED/table?fromstatweb at 03/06/2019

Centraal Bureau voor de Statistiek (n.d.). *Dossier Jongeren.* Retrieved from: https://www.cbs.nl/nl-

nl/dossier/dossier-jongeren at: 12/06/2019

Creswell, J.W. (2013). *Qualitative inquiry & research design: Choosing among the five approaches (*3rd

edition)*.* Sage: California, Thousand Oaks.

Donners, B. (2018). *Vergelijk vliegen met treinreizen voor korte afstanden en hoe we vaker voor de

trein kunnen kiezen.* Royal HaskoningDHV: The Netherlands, Amersfoort:

Duursma, M. (2017, December 1st). Advies aan minister: stel opening Lelystad Airport uit. *NRC.*

Retrieved from: https://www.nrc.nl/nieuws/2017/12/01/advies-aan-minister-stel-opening-

lelystad-airport-uit-a1583368 at: 04/03/2019

Duursma, M. (2018a, June 5th). Topmannen KLM en NS pleiten voor trein in Europa. *NRC.* Retrieved

from: https://www.nrc.nl/nieuws/2018/06/05/topmannen-klm-en-ns-pleiten-voor-trein-in-

europa-a1605545 at: 04/03/2019

Duursma, M. (2018b, June, 21st). Kabinet stimuleert gebruik trein als alternatief voor vliegtuig. *NRC.*

Retrieved from: https://www.nrc.nl/nieuws/2018/06/21/bij-vijf-steden-wint-trein-van-vliegtuig-

a1607566 at: 28/03/2019

Duursma, M. (2019, February 21st). Besluit Lelystad Airport deugt niet. *NRC.* Retrieved from:

https://www.nrc.nl/nieuws/2019/02/21/besluit-lelystad-airport-deugt-niet-a3655008 at:

04/03/2019

Eerenbeemt, M. van den (2018, December 22th). We treinen vaker door Europa, maar vliegen we ook

minder? *Volkskrant.* Retrieved from: https://www.volkskrant.nl/nieuws-achtergrond/we-treinen-

vaker-door-europa-maar-vliegen-we-ook-minder-~b101f96f/ at: 01/03/2019

Eldering, P. (2018, November 26th). 'Trein geen alternatief voor vliegen'. *De Telegraaf.* Retrieved from:

https://www.telegraaf.nl/nieuws/2845305/trein-geen-alternatief-voor-

vliegen?utm_source=google&utm_medium=organic at: 28/03/2019

European Commission (n.d.). *Paris Agreement.* Retrieved from:

https://ec.europa.eu/clima/policies/international/negotiations/paris_en at: 28/03/2019

Field, A. (2018). *Discovering statistics using IBM SPSS.*

Givoni, M. & D. Banister (2013). Mobility, transport and carbon. In M. Givoni & D. Banister (Ed.),

Moving towards low carbon mobility (p.1-10).

Hermanides, E. (2018, December 18th). Dankzij de 'vieze' luchtvaart pakken internationale reizigers

vaker de trein. *Trouw.* Via: https://www.trouw.nl/groen/dankzij-de-vieze-luchtvaart-pakken-

internationale-reizigers-vaker-de-trein~a3d7a683/ at: 28/02/2019

Klaus, M. S. vom & T. Heeg (2018, September 17th). Neue Züge nach Amsterdam kommen – aber erst
    2023. *Frankfurter Allgemeine Zeitung.* Retrieved from:
    https://www.faz.net/aktuell/wirtschaft/unternehmen/neue-zuege-nach-amsterdam-kommen-
    aber-erst-2023-15792989.html at: 05/03/2019

Knox P. L. & Marston S. A. (2014). *Human Geography Places and Regions in Global Context* (6th
    edition). London: Pearson Education.

Kraniotis, L. (2018, September 22nd). Gaan we ooit door heel Europa met de trein in plaats van het
    vliegtuig? *NOS.* Retrieved from: https://nos.nl/artikel/2251533-gaan-we-ooit-door-heel-europa-
    met-de-trein-in-plaats-van-het-vliegtuig.html at: 22/02/2019

Laconi, R. (2019, February 22nd). Ministerie overspoeld met ruim 9400 zienswijzen op Lelystad Airport:
    'Dit is echt extreem veel'. *De Gelderlander.* Retrieved from:
    https://www.gelderlander.nl/home/ministerie-overspoeld-met-ruim-9400-zienswijzen-op-
    lelystad-airport-dit-is-echt-extreem-veel~afee43869/ at: 04/03/2019

Lah, O. (2015). The barriers to low-carbon land-transport and policies to overcome them. *European
    Transport Research Review*, 7(1), 5. DOI: 10.1007/s12544-014-0151-3 at 25/02/2019

Macmillen, J. (2018). Governance, policy and mobility futures. In M. Givoni & D. Banister (Ed.), *Moving
    towards low carbon mobility*, 43-59.

Ministerie van Infrastructuur en Waterstaat (2019). *Contouren en toekomstbeeld OV 2040*. Retrieved
    from https://www.rijksoverheid.nl/documenten/rapporten/2019/02/06/contouren-
    toekomstbeeld-ov-2040 at 01/03/2019.

Omio (n.d.). *14 European Flights that are Actually Faster by Train*. Retrieved from:
    https://www.omio.com/travel/trains-vs-flights at 02/02/2019

Otten, M. B. J., M. J. J. 't Hoen & L. C. de Boer (2015). *STREAM Personenvervoer 2014. Studie naar de
    Transport Emissies van alle modaliteiten emissiekengetallen 2011* (rapport 1.1). CE Delft: The
    Netherlands, Delft

Peeters, P. (2017). *Tourism's impact on climate change and its mitigation challenges: How can tourism
    become 'climatically sustainable'?.* DOI: 10.4233/uuid:615ac06e-d389-4c6c-810e-7a4ab5818e8d

Profillides, V. A. & Botzoris, G.N. (2019). Transport demand and factors affecting it. In V. A. Profillides
    & G. N. Botzoris, *Modeling of transport demand: Analyzing, calculating and forecasting*, 1-46.
    DOI: 10.1016/B978-0-12-811513-8.00001-7

Punch, K. F. (2003). *Essential Resource Books for Social Research: Survey research.* SAGE Publications
    Ltd: London. DOI: 10.4135/9781849209984

Qualtrics Support (n.d.). *Survey Methodology & Compliance Best Practices.* Retrieved from:
    https://www.qualtrics.com/support/survey-platform/survey-module/survey-checker/survey-
    methodology-compliance-best-practices/#PredictedDuration at: 29/04/2019

Renzi, S., J. E. Klobas (2008). Using the Theory of Planned Behavior with qualitative research. *Dondena working papers*, 12. Retrieved from: www.dondena.unibocconi.it/wp12 at 05/06/2019

Transport & Environment (2016). *Transport is now Europe's biggest climate problem - EEA data.* Retrieved from: https://www.transportenvironment.org/press/transport-now-europe%E2%80%99s-biggest-climate-problem-eea-data at: 28/03/2019

Urry, J. (2007). *Mobilities.* Polity press: Cambrigde

University of Toronto (n.d.). *Pol242 Lab Manual: Exercise 3A. Cross tabulation with nominal variables*. Retrieved from: http://groups.chass.utoronto.ca/pol242/Labs/LM-3A/LM-3A_content.htm on 26/06/2019

Verlaan, J. (2019, February 24th). Trein van de toekomst is snel én duur. *NRC.* Via: https://www.nrc.nl/nieuws/2019/02/24/trein-van-de-toekomst-is-snel-en-duur-a3655224 at 01/03/2019

Vennix, J. A. M. (2011). *Theorie en praktijk voor emperisch onderzoek* (5th edition)*.* Pearson: Essex

Web Editors NS (2018). "Twee miljoen treinreizigers naar Berlijn haalbaar". *Nederlandse Spoorwegen.* Retrieved from: https://nieuws.ns.nl/ns-twee-miljoen-treinreizigers-naar-berlijn-haalbaar/ at: 05/03/2019

Web Editors TU Delft (2017). *Paul Peeters in diverse media over Luchtvaart maakt doelen klimaatakkoord Parijs onhaalbaar*. Retrieved from: https://www.tudelft.nl/2017/tbm/paul-peeters-in-diverse-media-over-luchtvaart-maakt-doelen-klimaatakkoord-parijs-onhaalbaar/ at: 01/03/2019

Web Editors Volkskrant (2018). Dit is ervoor nodig om ons in de trein naar Barcelona te krijgen. *Volkskrant.* Retrieved from: https://www.volkskrant.nl/kijkverder/2018/barcelona/ at: 02/03/2019

APPENDIX A: SURVEY DESIGN

Beste deelnemer,

Dit jaar rond ik mijn bachelor Geografie, Planologie en Milieu af met een scriptie over de vervoermiddel keuze naar internationale bestemmingen op korte afstanden (minder dan 700km vanuit Nederland). Een belangrijke verbinding vanuit Nederland is die naar Berlijn en daar is momenteel veel aandacht voor in de vorm van beleidsontwikkelingen. Tegelijkertijd is er echter weinig bekend is over de vervoermiddelkeuze van reizigers op zulke afstanden. Met behulp van deze enquête en uw deelname zal er meer kennis op dit gebied verworven worden.

Deze vragenlijst zal u tussen de 5 à 10 minuten tijd kosten. De resultaten van de enquête zullen anoniem verwerkt worden en zullen alleen voor academische doeleinden gebruikt worden. Ik dank u alvast voor de deelname.

In het kort:

➢ Onderwerp: vervoermiddelkeuze naar internationale reisbestemming tot 700km;
➢ Casus: de verbinding Nederland-Berlijn;
➢ Tijdsduur: 5 à 10 minuten;
➢ Anonieme dataverwerking

1) Bent u in 2018 of 2019 naar Berlijn gereisd of van plan in 2019 of 2020 naar Berlijn te reizen? (1 antwoord mogelijk)

o Ja, ik ben in 2018 of 2019 naar Berlijn gereisd.
o Ja, ik ben van plan in 2019 of 2020 naar Berlijn te reizen
o Ja, ik ben naar Berlijn gereisd in 2018 of 2019 en ik ben van plan te reizen naar Berlijn in 2019 of 2020
o Nee

Sectie 1: Respondent is van Nederland naar Berlijn gereisd in 2018 en/of 2019

2) Hoe vaak bent u naar Berlijn gereisd in 2018 en 2019? (Bent u bijvoorbeeld 2x naar Berlijn geweest, schrijf: 2)

………………………………………….

3) Welk soort reis heeft u ondernomen naar Berlijn? (1 antwoord mogelijk)

o Vakantie/privé
o Zakelijk
o Beide
o Anders, namelijk …………………………………………..

4) Met welke hoofdvervoermiddel (waarmee u de meeste afstand heeft af gelegd) heeft u van Nederland naar Berlijn gereisd? (meerdere antwoorden mogelijk)

Geef in de tekstvakjes achter het antwoord aan hoe vaak u van dit type vervoermiddel heeft gebruikt. Heeft u voor de heenweg een ander vervoermiddel gebruikt dan de terugweg, schrijf 0,5 per vervoermiddel. '

- Vliegtuig …………………..
- Trein ………………..
- Bus ………………..
- Auto …………………
- Anders, namelijk ……………………..

Sectie 2: De respondent is van plan naar Berlijn te reizen in 2019 en/of 2020

5) Hoe vaak bent u van plan naar Berlijn te reizen in 2019 en 2020? (Bent u bijvoorbeeld van plan 2x naar Berlijn te reizen, schrijf: 2)

……………………………………………….

6) Welk soort reis bent u van plan te ondernemen naar Berlijn?

- o Vakantie/privé
- o Zakelijk
- o Beide
- o Anders, namelijk …………………………………………

7) Met welke hoofdvervoermiddel (waarmee u de meeste afstand zal afleggen) bent u van plan om van Nederland naar Berlijn te reizen?

Geef in de tekstvakjes achter het antwoord aan hoe vaak u van plan bent dit type vervoermiddel te gebruiken. Gebruikt u voor de heenweg een ander vervoersmiddel dan de terugweg, schrijf 0,5 per vervoermiddel.

- Vliegtuig …………………..
- Trein ………………..
- Bus ………………..
- Auto …………………
- Anders, namelijk ……………………..

Sectie 3: Alle respondenten

8) Hoe belangrijk zijn de volgende factoren voor u bij de reis van Nederland naar Berlijn?

	Onbelangrijk	Enigszins belangrijk	Redelijke belangrijk	Belangrijk	Zeer belangrijk
Reistijd van deur tot deur					

Punctualiteit					
Totale kosten					
Frequentie van de connectie					
Aantal keer overstappen					
Stresservaring tijdens te reis					
Reiscomfort (denk aan de gemakkelijkheid van de stoel en services als restauratieve voorzieningen)					
Mogelijkheid om te ontspannen					
Tijd om productief bezig te kunnen zijn					
Milieubelasting van het vervoermiddel					
Veiligheid					
Bekendheid met het vervoermiddel					
Mogelijkheid om te kunnen bellen / internetten					

Bij de volgende vragen gaat het over een nieuwe reis van Nederland naar Berlijn plannen.

9) De volgende stellingen gaan erover wat u zelf vindt van de reis maken met het gegeven vervoermiddel. Met logisch wordt bedoeld wat u een voor de hand liggende, voordelige keuze vindt.

	Heel logisch	Redelijk logische	Niet logisch, niet onlogisch	Redelijk onlogisch	Heel onlogisch	n.v.t.
Het is volgens mij een *logische / onlogische* keuze om de						

volgende keer **het vliegtuig** te nemen						
Het is volgens mij een *logische / onlogische* keuze om de volgende keer **de trein** te nemen						
Het is volgens mij een *logische / onlogische* keuze om de volgende keer **de auto** te nemen						
Het is volgens mij een *logische / onlogische* keuze om de volgende keer **de bus** te nemen						

10) De volgende stellingen gaan erover wat u zelf vindt van de reis maken met het gegeven vervoermiddel. Met comfortabel wordt bedoeld of u het vervoermiddel als aangenaam, prettig ervaart.

	Heel comfortabel	Redelijk comfortabel	Niet comfortabel, niet oncomfortabel	Redelijk oncomfortabel	Heel oncomfortabel	Nvt
De keuze om (de volgende keer) **het vliegtuig** te nemen, lijkt mij:						
De keuze om (de volgende keer) **de trein** te nemen, lijkt mij:						
De keuze om (de volgende keer) **de auto**						

te nemen, lijkt mij:					
De keuze om (de volgende keer) **de bus** te nemen, lijkt mij:					

11) De meeste mensen uit mijn omgeving zouden het volgende vervoermiddel kiezen:

- o Het vliegtuig
- o De trein
- o De auto
- o De bus
- o Anders, namelijk: ……………………………………….

12) Uit mijn omgeving zouden de meeste mensen mij aanraden het volgende vervoermiddel te kiezen:

- o Het vliegtuig
- o De trein
- o De auto
- o De bus
- o Anders, namelijk: ……………………………………..

13) Uit mijn omgeving zouden de meeste mensen van mening zijn dat ik het volgende vervoermiddel zou moeten kiezen:

- o Het vliegtuig
- o De trein
- o De auto
- o De bus
- o Anders, namelijk: ……………………………………..

Deze vragen gaan **over het plannen** van een nieuwe reis naar Berlijn.

14) De volgende stellingen gaan erover hoeveel moeite u verwacht dat het kost om een reis te plannen met het gegeven vervoermiddel. Gemakkelijk houdt hier in dat u verwacht dat het weinig moeite kost, lastig houdt hier in dat u verwacht dat het veel moeite kost.

	Heel gemakkelijk	Redelijk gemakkelijk	Niet gemakkelijk, niet lastig	Redelijk lastig	Heel lastig	N.v.t.
De keuze om (de volgende keer) **het vliegtuig** te						

nemen, lijkt mij:						
De keuze om (de volgende keer) **de trein** te nemen, lijkt mij:						
De keuze om (de volgende keer) **de auto** te nemen, lijkt mij:						
De keuze om (de volgende keer) **de bus** te nemen, lijkt mij:						

15) Hoogstwaarschijnlijk neem ik bij de volgende reis die ik naar Berlijn zou plannen:

- o Het vliegtuig
- o De trein
- o De auto
- o De bus
- o Anders, namelijk: …………………………………………….

16) Geef aan welke drie factoren de meest doorslaggevende rol hebben gespeeld voor u om de volgende keer te kiezen voor dat vervoersmiddel:

- ▪ Reistijd van deur tot deur
- ▪ Punctualiteit
- ▪ Totale kosten
- ▪ Frequentie van de connectie
- ▪ Aantal keer overstappen
- ▪ Stresservaring tijdens te reis
- ▪ Reiscomfort (denk aan de gemakkelijkheid van de stoel en services als restauratieve voorzieningen)
- ▪ Mogelijkheid om te ontspannen
- ▪ Tijd om productief bezig te kunnen zijn
- ▪ Milieubelasting van het vervoermiddel
- ▪ Veiligheid
- ▪ Bekendheid met het vervoermiddel
- ▪ Mogelijkheid om te kunnen bellen / internetten

17) Sectie 4: Socio-demografische variabelen

U bent nu bij het laatste onderdeel aangekomen. Deze vragen hebben betrekking op uw persoonlijke situatie. Hierbij wil ik graag nogmaals vermelden dat de enquête anoniem verwerkt wordt.

18) Wat zijn de vier cijfers van uw postcode gebied?

………………………………………..

19) Wat is uw leeftijd?

………………………………………..

20) Wat is uw geslacht?

- o Vrouw
- o Man
- o Weet ik niet/ zeg ik liever niet

21) Wat is uw (geschatte) jaarlijks inkomen? (Bijv. 21000)

………………………………………..

Voor mijn onderzoek zouden een aantal interviews (telefonisch) extra informatie kunnen opleveren. Als u interesse heeft hier aan mee te doen, zou ik u graag willen vragen uw e-mailadres hier achter te laten.

22) U kunt er later altijd vrijblijvend terugkomen op uw beslissing. Deze gegevens zullen verwijderd worden zodra het onderzoek afgerond is.

………………………………………..

Sectie 5: Slot

Bedankt voor deelname aan dit onderzoek over vervoersmiddelkeuze naar Berlijn. Uw antwoorden zullen anoniem verwerkt worden en alleen voor academische doeleinden gebruikt worden. Mocht u naar aanleiding van deze enquête vragen hebben over dit onderzoek, neem dan contact op met mij via: e.dewinter@student.ru.nl.

APPENDIX B: INTERVIEWGUIDE

Bedankt voor uw deelname aan dit interview. Ik doe een afstudeer onderzoek naar vervoermiddelkeuze op de connectie tussen Nederland en Berlijn. Deze interviews zullen net als de survey anoniem verwerkt worden, wat bijvoorbeeld inhoudt het gebruik van een fictieve naam. De tijdsduur van het interview is circa 30-45 minuten (echter kon ik door omstandigheden mijn testpersoon niet interviewen dus heb ik dit niet kunnen testen). Om de interviews te verwerken zou ik het graag willen opnemen, zou ik daarvoor toestemming mogen?

Introductie

Om mij allereerst een goed beeld te geven, zou ik u willen vragen om mij meer te vertellen over uw huidige situatie: Bijvoorbeeld bent u werkend? Of studerend? Heeft u bijvoorbeeld kinderen? Wat is uw woonsituatie?

1) Deze vragen gaan over uw reissituatie van Nederland naar Berlijn. Zou u me allereerst een kort beeld schetsen kunnen schetsen met: of u recent naar Berlijn bent gereisd, of dat u dat binnenkort van plan bent? Zou u dit kunnen aanvullen met hoe vaak u deze reis maakt?

2) Waarom bent u recentelijk naar Berlijn gereisd/van plan naar Berlijn te reizen? Wat is het doel?

Kern

3) Met welk vervoersmiddel(en) bent u gereisd/bent u van plan te reizen naar Berlijn?
4) Waarom heb je specifiek voor dit vervoersmiddel gekozen?
- Vervolg:
  - Wat vindt u voordelen van dit vervoersmiddel?
  - Wat vindt u nadelen van dit vervoersmiddel?
  - Reist u altijd met hetzelfde vervoersmiddel? Waarom wel/ niet?
5) Welke andere vervoersmiddelen heeft u overwogen?
- Vervolg:
  - Waarom heeft u niet voor dit vervoersmiddel gekozen en welk voor het andere?
  - Waarom heeft u niet (de trein, vliegtuig, bus, auto) overwogen?
  - Als de persoon frequent reist: Waarom reisde u eerst met vervoersmiddel A en nu met vervoersmiddel B?
6) In hoeverre spelen andere mensen een rol bij de beslissing voor het vervoersmiddel?
- Vervolg:
  - Deelden zij dezelfde mening als u?
  - Als de geïnterviewde geen keuze had: Zou u zelf dezelfde keuze gemaakt hebben en waarom?
7) Is er volgens u een verschil in status tussen de verschillende vervoersmiddelen? (Ik bedoel hiermee of mensen een andere waarde hechten aan de verschillende vervoersmiddelen in uw omgeving)
- Vervolg:
  - Zo ja: Welke status hebben de trein, het vliegtuig, de bus en de auto volgens u?
8) Hoe beviel u het plannen van de reis?
- Vervolg:
  - Hoe vond u de informatie voorziening voor & tijdens de reis?
9) *U bent al geweest naar Berlijn:* Hoe vond u de reis? Wat beviel u wel en wat niet?

10) *U bent met de trein gereisd*: Hoe denkt u dat er meer mensen voor de trein zullen kiezen?

11) *U bent met het vliegtuig gereisd*: Hoe ervaart u het maatschappelijk debat over het vervangen van vliegen met treinreizen naar Europese bestemming vanwege klimaatoverwegingen?

-Afsluiting-

12) Dit waren alle vragen. Nogmaals bedankt voor uw deelname aan het interview. Zou u nog iets willen toevoegen wat niet aan bod is gekomen?

Zou u interesse hebben om mijn scriptie te ontvangen als deze is afgerond?

Dan wens ik u nog een prettige dag/avond verder.

APPENDIX C: DESCRIPTIVE TABLES

Table 37: Gender of respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	111	50,0	60,3	60,3
	Male	70	31,5	38,0	98,4
	Don't know/rather not say	3	1,4	1,6	100,0
	Total	184	82,9	100,0	
Missing	System	38	17,1		
Total		222	100,0		

Table 38: Age of respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	17,00	1	,5	,5	,5
	18,00	2	,9	1,1	1,6
	19,00	12	5,4	6,5	8,2
	20,00	11	5,0	6,0	14,1
	21,00	20	9,0	10,9	25,0
	22,00	22	9,9	12,0	37,0
	23,00	16	7,2	8,7	45,7
	24,00	18	8,1	9,8	55,4
	25,00	12	5,4	6,5	62,0
	26,00	9	4,1	4,9	66,8
	27,00	4	1,8	2,2	69,0
	28,00	5	2,3	2,7	71,7
	29,00	4	1,8	2,2	73,9
	30,00	2	,9	1,1	75,0
	31,00	1	,5	,5	75,5
	32,00	4	1,8	2,2	77,7
	33,00	2	,9	1,1	78,8
	34,00	5	2,3	2,7	81,5
	35,00	4	1,8	2,2	83,7
	36,00	2	,9	1,1	84,8
	38,00	2	,9	1,1	85,9
	39,00	3	1,4	1,6	87,5
	41,00	1	,5	,5	88,0
	42,00	2	,9	1,1	89,1
	43,00	2	,9	1,1	90,2
	44,00	3	1,4	1,6	91,8

		Frequency	Percent	Valid Percent	Cumulative Percent
	45,00	1	,5	,5	92,4
	46,00	1	,5	,5	92,9
	48,00	2	,9	1,1	94,0
	49,00	2	,9	1,1	95,1
	51,00	1	,5	,5	95,7
	52,00	2	,9	1,1	96,7
	53,00	1	,5	,5	97,3
	55,00	1	,5	,5	97,8
	62,00	1	,5	,5	98,4
	64,00	1	,5	,5	98,9
	68,00	2	,9	1,1	100,0
	Total	184	82,9	100,0	
Missing	System	38	17,1		
Total		222	100,0		
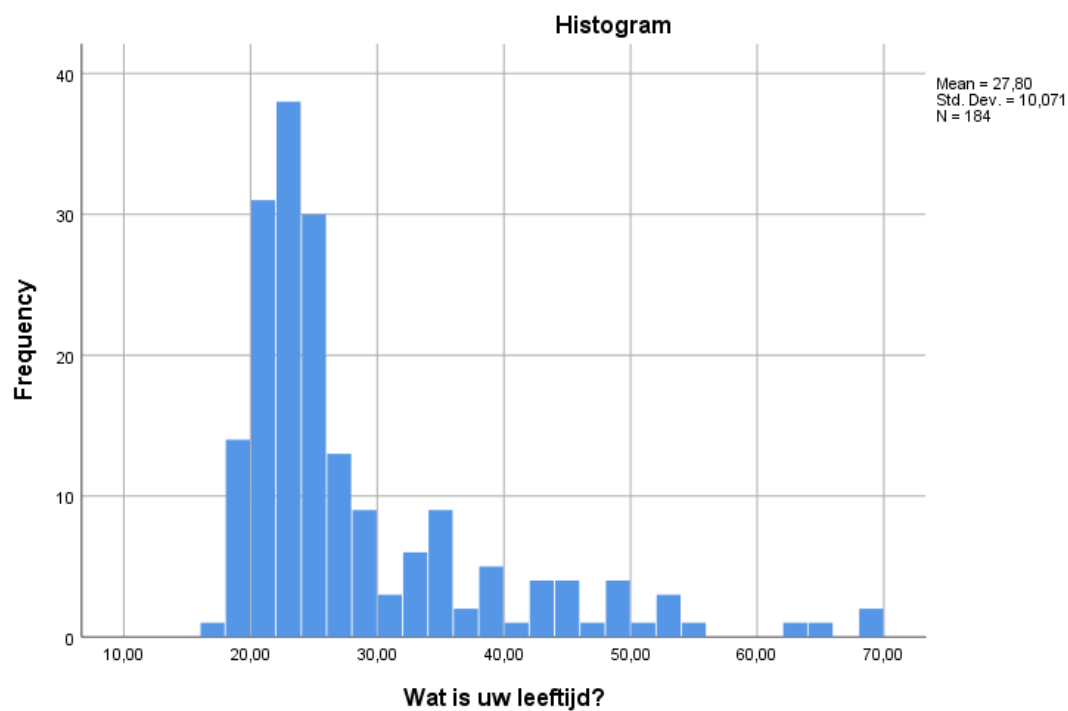
Figure 2: Distribution of age.

Postal code

Table 39: Postal code

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1018	1	,5	,5	,5
	1019	2	,9	1,1	1,6
	1021	1	,5	,5	2,2
	1033	1	,5	,5	2,7

58

	1055	1	,5	,5	3,3
	1071	1	,5	,5	3,8
	1078	1	,5	,5	4,4
	1081	1	,5	,5	4,9
	1092	2	,9	1,1	6,0
	1096	2	,9	1,1	7,1
	1112	1	,5	,5	7,7
	1183	1	,5	,5	8,2
	1205	1	,5	,5	8,7
	1341	1	,5	,5	9,3
	1551	1	,5	,5	9,8
	1621	1	,5	,5	10,4
	1822	1	,5	,5	10,9
	1921	1	,5	,5	11,5
	2012	1	,5	,5	12,0
	2023	1	,5	,5	12,6
	2106	1	,5	,5	13,1
	2312	1	,5	,5	13,7
	2315	1	,5	,5	14,2
	2498	1	,5	,5	14,8
	2546	1	,5	,5	15,3
	2613	1	,5	,5	15,8
	2622	1	,5	,5	16,4
	2628	1	,5	,5	16,9
	2631	1	,5	,5	17,5
	2641	2	,9	1,1	18,6
	2642	4	1,8	2,2	20,8
	2700	1	,5	,5	21,3
	2717	1	,5	,5	21,9
	3011	1	,5	,5	22,4
	3023	1	,5	,5	23,0
	3024	2	,9	1,1	24,0
	3039	1	,5	,5	24,6
	3067	1	,5	,5	25,1
	3072	1	,5	,5	25,7
	3247	1	,5	,5	26,2
	3315	1	,5	,5	26,8
	3328	1	,5	,5	27,3
	3504	1	,5	,5	27,9
	3511	1	,5	,5	28,4
	3515	3	1,4	1,6	30,1
	3523	2	,9	1,1	31,1
	3532	1	,5	,5	31,7

3551	1	,5	,5	32,2
3552	1	,5	,5	32,8
3583	1	,5	,5	33,3
3584	1	,5	,5	33,9
3705	1	,5	,5	34,4
3824	1	,5	,5	35,0
3881	1	,5	,5	35,5
3951	1	,5	,5	36,1
3971	1	,5	,5	36,6
4031	1	,5	,5	37,2
4103	2	,9	1,1	38,3
4157	1	,5	,5	38,8
4453	1	,5	,5	39,3
4651	1	,5	,5	39,9
4751	1	,5	,5	40,4
4755	1	,5	,5	41,0
4811	2	,9	1,1	42,1
4834	1	,5	,5	42,6
5038	1	,5	,5	43,2
5042	1	,5	,5	43,7
5085	1	,5	,5	44,3
5384	1	,5	,5	44,8
5491	1	,5	,5	45,4
5527	1	,5	,5	45,9
5612	1	,5	,5	46,4
5615	1	,5	,5	47,0
5685	1	,5	,5	47,5
5711	1	,5	,5	48,1
5808	1	,5	,5	48,6
5915	1	,5	,5	49,2
5926	1	,5	,5	49,7
6045	1	,5	,5	50,3
6131	1	,5	,5	50,8
6229	1	,5	,5	51,4
6432	1	,5	,5	51,9
6511	4	1,8	2,2	54,1
6512	4	1,8	2,2	56,3
6521	1	,5	,5	56,8
6522	1	,5	,5	57,4
6523	3	1,4	1,6	59,0
6524	1	,5	,5	59,6
6525	11	5,0	6,0	65,6
6531	2	,9	1,1	66,7

6534	1	,5	,5	67,2
6541	3	1,4	1,6	68,9
6542	4	1,8	2,2	71,0
6545	1	,5	,5	71,6
6655	1	,5	,5	72,1
6658	1	,5	,5	72,7
6721	1	,5	,5	73,2
6812	1	,5	,5	73,8
6828	2	,9	1,1	74,9
6851	1	,5	,5	75,4
6902	1	,5	,5	76,0
6941	1	,5	,5	76,5
7412	1	,5	,5	77,0
7461	1	,5	,5	77,6
7627	1	,5	,5	78,1
7691	1	,5	,5	78,7
7827	1	,5	,5	79,2
8251	1	,5	,5	79,8
8431	1	,5	,5	80,3
9132	1	,5	,5	80,9
9351	1	,5	,5	81,4
9403	1	,5	,5	82,0
9711	1	,5	,5	82,5
9712	1	,5	,5	83,1
9715	1	,5	,5	83,6
9721	1	,5	,5	84,2
9725	1	,5	,5	84,7
10115	1	,5	,5	85,2
10119	1	,5	,5	85,8
10178	3	1,4	1,6	87,4
10243	1	,5	,5	88,0
10249	1	,5	,5	88,5
10263	1	,5	,5	89,1
10319	1	,5	,5	89,6
10367	1	,5	,5	90,2
10407	1	,5	,5	90,7
10437	1	,5	,5	91,3
10551	1	,5	,5	91,8
10777	1	,5	,5	92,3
10963	1	,5	,5	92,9
10967	1	,5	,5	93,4
10997	1	,5	,5	94,0
10999	1	,5	,5	94,5

	12043	1	,5	,5	95,1
	12051	2	,9	1,1	96,2
	12589	1	,5	,5	96,7
	13347	1	,5	,5	97,3
	13353	2	,9	1,1	98,4
	13355	1	,5	,5	98,9
	14612	1	,5	,5	99,5
	22767	1	,5	,5	100,0
	Total	183	82,4	100,0	
Missing	System	39	17,6		
Total		222	100,0		
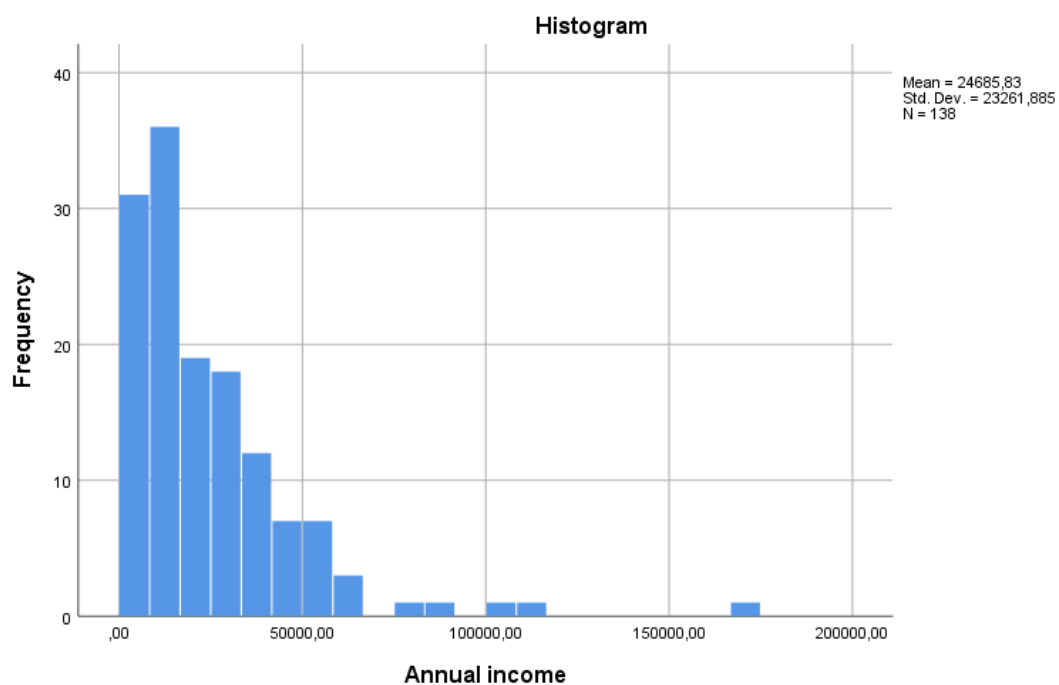
Figure 3: Distribution of income

62

APPENDIX D: STATISTICAL TESTS

Frequency * intended travel mode choice

Table 40: Crosstab - Intended travel mode choice * Travel frequency

			Travel frequency			Total
			Once	2-5 times travelled (frequent)	6 or more (very frequent	
Intended travel mode choice	Airplane	Count	8_a	$7_{a, b}$	19_b	34
		% column	10,5%	14,6%	31,7%	18,5%
	Train	Count	51_a	28_a	30_a	109
		% column	67,1%	58,3%	50,0%	59,2%
	Car	Count	6_a	7_a	10_a	23
		% column	7,9%	14,6%	16,7%	12,5%
	Bus	Count	11_a	$6_{a, b}$	1_b	18
		% column	14,5%	12,5%	1,7%	9,8%
Total		Count	76	48	60	184
		% column	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Travel frequency categories whose column proportions do not differ significantly from each other at the ,05 level.

Gender * perceived behavioural control

Table 41: Crosstab - Gender * perceived behavioural control airplane

			Gender		Total
			Female	Male	
Perceived behavioural control Airplane	Positive	Count	67_a	54_b	121
		% column	60,4%	77,1%	66,9%
	Neutral	Count	26_a	5_b	31
		% column	23,4%	7,1%	17,1%
	Negative	Count	18_a	11_a	29
		% column	16,2%	15,7%	16,0%
Total		Count	111	70	181
		% column	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of gender categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 42: Cramer's V - Gender * perceived behavioural control

		Value	Approximate Significance
Nominal by Nominal	Phi	,216	,015
	Cramer's V	,216	,015
N of Valid Cases		181	

Table 43: Crosstab - Gender * perceived behavioural control Train

			Gender		Total
			Female	Male	
Perceived behavioural control Train	Positive	Count	95$_a$	50$_b$	145
		% column	85,6%	72,5%	80,6%
	Neutral	Count	8$_a$	12$_b$	20
		% column	7,2%	17,4%	11,1%
	Negative	Count	8$_a$	7$_a$	15
		% column	7,2%	10,1%	8,3%
Total		Count	111	69	180
		% column	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of gender categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 44: Cramer's V - Gender * perceived behavioural control Train

		Value	Approximate Significance
Nominal by Nominal	Phi	,172	,070
	Cramer's V	,172	,070
N of Valid Cases		180	

Table 44: Crosstab - Gender * perceived behavioural control Car

			Gender		Total
			Female	Male	
Perceived behavioural control Car	Positive	Count	57$_a$	39$_a$	96
		% column	53,3%	57,4%	54,9%
	Neutral	Count	19$_a$	10$_a$	29
		% column	17,8%	14,7%	16,6%
	Negative	Count	31$_a$	19$_a$	50
		% column	29,0%	27,9%	28,6%
Total		Count	107	68	175
		% column	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Gender categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 45: Chi-Square - Gender * perceived behavioural control Car

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	,375[a]	2	,829
N of Valid Cases	175		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 11,27.

Table 46: Cramer's V - Gender * perceived behavioural control Car

		Value	Approximate Significance
Nominal by Nominal	Phi	,046	,829
	Cramer's V	,046	,829
N of Valid Cases		175	

Table 47: Crosstab - Gender * perceived behavioural control Bus

			Gender		Total
			Female	Male	
Perceived behavioural control bus	Positive	Count	69[a]	31[b]	100
		% column	63,3%	44,9%	56,2%
	Neutral	Count	15[a]	13[a]	28
		% column	13,8%	18,8%	15,7%
	Negative	Count	25[a]	25[a]	50
		% column	22,9%	36,2%	28,1%
Total		Count	109	69	178
		% column	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Gender categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 48: Chi-Square - Gender * perceived behavioural control Bus

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5,892[a]	2	,053
N of Valid Cases	178		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 10,85.

Table 49: Cramer's V - Gender * perceived behavioural control Bus

		Value	Approximate Significance
Nominal by Nominal	Phi	,182	,053
	Cramer's V	,182	,053
N of Valid Cases		178	

Age * behavioural attitude

Table 50: Crosstab - Age * behavioural attitude Car

			Age	Age	Total
			Youth (27 or younger)	Adult (28 or older)	
Behavioural attitude Car	Positive	Count	77$_a$	27$_a$	104
		% column	63,6%	49,1%	59,1%
	Neutral	Count	21$_a$	6$_a$	27
		% column	17,4%	10,9%	15,3%
	Negative	Count	23$_a$	22$_b$	45
		% column	19,0%	40,0%	25,6%
Total		Count	121	55	176
		% column	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Age categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 51: Cramer's V - Age * behavioural attitude Car

		Value	Approximate Significance
Nominal by Nominal	Phi	,225	,012
	Cramer's V	,225	,012
N of Valid Cases		176	

Table 52: Crosstab - Age * behavioural attitude Bus

			Age	Age	Total
			Youth (27 or younger)	Adult (28 or older)	
Behavioural attitude bus	Positive	Count	40$_a$	10$_a$	50
		% column	31,5%	17,9%	27,3%
	Neutral	Count	16$_a$	2$_a$	18
		% column	12,6%	3,6%	9,8%
	Negative	Count	71$_a$	44$_b$	115
		% column	55,9%	78,6%	62,8%
Total		Count	127	56	183
		% column	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Age categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 53: Cramer's V - Age * behavioural attitude Car

		Value	Approximate Significance
Nominal by Nominal	Phi	,222	,011
	Cramer's V	,222	,011
N of Valid Cases		183	

Age * total costs

Table 54: Crosstab – Total costs * Age

			Age		Total
			Youth (27 or younger)	Adult (28 or older)	
Total costs	Unimportant & slightly important	Count	4_a	4_a	8
		% column	3,1%	7,0%	4,3%
	Moderately important	Count	11_a	15_b	26
		% column	8,7%	26,3%	14,1%
	Important	Count	50_a	26_a	76
		% column	39,4%	45,6%	41,3%
	Very important	Count	62_a	12_b	74
		% column	48,8%	21,1%	40,2%
Total		Count	127	57	184
		% column	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Verdeling jongeren en ouderen categories whose column proportions do not differ significantly from each other at the ,05 level.

Income * intended travel mode choice

Table 55: Multiple Comparisons – Games-Howell – annual income

(I) Intended travel mode choice	(J) Intended travel mode choice	Mean Difference (I-J)	Std. Error	Sig.
Airplane	Train	19730,83333[*]	6663,44761	,028
	Car	14958,69048	9715,88038	,426
	Bus	28206,41026[*]	6920,96052	,001
Train	Airplane	-19730,83333[*]	6663,44761	,028
	Car	-4772,14286	7428,98019	,916
	Bus	8475,57692[*]	2948,06881	,039
Car	Airplane	-14958,69048	9715,88038	,426
	Train	4772,14286	7428,98019	,916
	Bus	13247,71978	7660,80330	,342
Bus	Airplane	-28206,41026[*]	6920,96052	,001
	Train	-8475,57692[*]	2948,06881	,039
	Car	-13247,71978	7660,80330	,342

Behavioural attitude * intended transport mode

Table 56: Crosstab – Intended travel mode choice * Behavioural attitude Airplane

			Behavioural attitude Airplane			Total
			Positive	Neutral	Negative	
Intended travel mode choice	Airplane	Count	29a	1b	4b	34
		% column	41,4%	2,9%	5,4%	19,0%
	Train	Count	30a	24b	51b	105
		% column	42,9%	68,6%	68,9%	58,7%
	Car	Count	7a	4a	11a	22
		% column	10,0%	11,4%	14,9%	12,3%
	Bus	Count	4a	6a	8a	18
		% column	5,7%	17,1%	10,8%	10,1%
Total		Count	70	35	74	179
		% column	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of behavioural attitude Airplane categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 57: Cramer's V – Intended travel mode choice * Behavioural attitude Airplane

		Value	Approximate Significance
Nominal by Nominal	Phi	,468	,000
	Cramer's V	,331	,000
N of Valid Cases		179	

Table 57: Crosstab – Intended travel mode choice * Behavioural attitude Train

			Behavioural attitude Train			Total
			Positive	Neutral	Negative	
Intended travel mode choice	Airplane	Count	23a	5b	6b	34
		% column	14,5%	41,7%	54,5%	18,7%
	Train	Count	102a	3b	2b	107
		% column	64,2%	25,0%	18,2%	58,8%
	Car	Count	20a	2a	1a	23
		% column	12,6%	16,7%	9,1%	12,6%
	Bus	Count	14a	2a	2a	18
		% column	8,8%	16,7%	18,2%	9,9%
Total		Count	159	12	11	182
		% column	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of behavioural attitude Train categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 59: Cramer's V – Intended travel mode choice * Behavioural attitude Train

		Value	Approximate Significance
Nominal by Nominal	Phi	,335	,002
	Cramer's V	,237	,002
N of Valid Cases		182	

Table 60: Crosstab – Intended travel mode choice * Behavioural attitude Car

			Behavioural attitude Car			Total
			Positive	Neutral	Negative	
Intended travel mode choice	Airplane	Count	16$_a$	4$_a$	11$_a$	31
		% column	15,4%	14,8%	24,4%	17,6%
	Train	Count	55$_a$	18$_a$	32$_a$	105
		% column	52,9%	66,7%	71,1%	59,7%
	Car	Count	22$_a$	1$_{a, b}$	0$_b$	23
		% column	21,2%	3,7%	0,0%	13,1%
	Bus	Count	11$_a$	4$_a$	2$_a$	17
		% column	10,6%	14,8%	4,4%	9,7%
Total		Count	104	27	45	176
		% column	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of behavioural attitude Car categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 61: Cramer's V – Intended travel mode choice * Behavioural attitude Car

		Value	Approximate Significance
Nominal by Nominal	Phi	,325	,005
	Cramer's V	,230	,005
N of Valid Cases		176	

Table 62: Crosstab – Intended travel mode choice * Behavioural attitude Bus

			Behavioural attitude bus			Total
			Positive	Neutral	Negative	
Intended travel mode choice	Airplane	Count	3_a	$1_{a, b}$	29_b	33
		% column	6,3%	5,6%	24,8%	18,0%
	Train	Count	27_a	13_a	69_a	109
		% column	56,3%	72,2%	59,0%	59,6%
	Car	Count	2_a	2_a	19_a	23
		% column	4,2%	11,1%	16,2%	12,6%
	Bus	Count	16_a	2_a	0_b	18
		% column	33,3%	11,1%	0,0%	9,8%
Total		Count	48	18	117	183
		% column	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of score voor behavioural attitude bus categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 61: Cramer's V – Intended travel mode choice * Behavioural attitude Bus

		Value	Approximate Significance
Nominal by Nominal	Phi	,529	,000
	Cramer's V	,374	,000
N of Valid Cases		183	

Importance environmental impact * behavioural attitude airplane

Table 62: Crosstab - Importance environmental impact * behavioural attitude airplane

			Behavioural attitude Airplane			Total
			Positive	Neutral	Negative	
Importance environmental impact	Unimportant	Count	19_a	$5_{a, b}$	8_b	32
		% column	25,7%	13,2%	10,4%	16,9%
	Slightly important	Count	21_a	$8_{a, b}$	9_b	38
		% column	28,4%	21,1%	11,7%	20,1%
	Moderate important	Count	12_a	11_a	11_a	34
		% column	16,2%	28,9%	14,3%	18,0%
	Important	Count	13_a	$7_{a, b}$	31_b	51
		% column	17,6%	18,4%	40,3%	27,0%
	Very important	Count	9_a	7_a	18_a	34
		% column	12,2%	18,4%	23,4%	18,0%
Total		Count	74	38	77	189
		% column	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of behavioural attitude Airplane categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 63: Cramer's V - Importance environmental impact ***** behavioural attitude airplane

		Value	Approximate Significance
Nominal by Nominal	Phi	,365	,001
	Cramer's V	,258	,001
N of Valid Cases		189	

Intended mode of transport * Total costs

Table 64: Crosstab - Intended mode of transport ***** Total costs

			Total costs					Total
			Unimportant	Slightly important	Moderately important	Important	Very important	
Intended travel mode choice	Airplane	Count	2a, b	3b	7a, b	13a, b	9a	34
		% column	66,7%	60,0%	26,9%	17,1%	12,2%	18,5%
	Train	Count	0a	1a	17a	46a	45a	109
		% column	0,0%	20,0%	65,4%	60,5%	60,8%	59,2%
	Car	Count	0a	1a	1a	13a	8a	23
		% column	0,0%	20,0%	3,8%	17,1%	10,8%	12,5%
	Bus	Count	1a	0a	1a	4a	12a	18
		% column	33,3%	0,0%	3,8%	5,3%	16,2%	9,8%
Total		Count	3	5	26	76	74	184
		% column	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Totale kosten: Belangrijk? categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 65: Cramer's V - Intended mode of transport ***** Total costs

		Value	Approximate Significance
Nominal by Nominal	Phi	,375	,011
	Cramer's V	,216	,011
N of Valid Cases		184	

Travel time * intended mode of transport

Table 67: Crosstab - Intended mode of transport * Total costs

			Travel time					Total
			Unimportant	Slightly important	Moderately important	Important	Very important	
Intended travel mode choice	Airplane	Count	0_a	2_a	6_a	15_a	11_a	34
		% column	0,0%	6,9%	12,5%	20,5%	35,5%	18,5%
	Train	Count	1_a	23_a	32_a	38_a	15_a	109
		% column	33,3%	79,3%	66,7%	52,1%	48,4%	59,2%
	Car	Count	0_a	3_a	6_a	11_a	3_a	23
		% column	0,0%	10,3%	12,5%	15,1%	9,7%	12,5%
	Bus	Count	2_a	1_b	4_b	$9_{a, b}$	2_b	18
		% column	66,7%	3,4%	8,3%	12,3%	6,5%	9,8%
Total		Count	3	29	48	73	31	184
		% column	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Travel time categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 68: Cramer's V - Intended mode of transport * Total costs

		Value	Approximate Significance
Nominal by Nominal	Phi	,374	,012
	Cramer's V	,216	,012
N of Valid Cases		184	

Importance environmental impact * intended mode of transport

Table 69: Crosstab - Intended mode of transport * Importance environmental impact

			Importance enviromental impact					Total
			Unimportant	Slightly important	Moderately important	Important	Very important	
Intended travel mode choice	Airplane	Count	11_a	8_a	8_a	5_a	2_a	34
		% column	33,3%	22,9%	24,2%	9,8%	6,3%	18,5%
	Train	Count	14_a	16_a	13_a	40_b	26_b	109
		% column	42,4%	45,7%	39,4%	78,4%	81,3%	59,2%
	Car	Count	7_a	4_a	7_a	3_a	2_a	23
		% column	21,2%	11,4%	21,2%	5,9%	6,3%	12,5%
	Bus	Count	1_a	7_a	5_a	3_a	2_a	18
		% column	3,0%	20,0%	15,2%	5,9%	6,3%	9,8%
Total		Count	33	35	33	51	32	184
		% column	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Importance environmental impact categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 70: Cramer's V - Intended mode of transport * Importance environmental impact

		Value	Approximate Significance
Nominal by Nominal	Phi	,433	,001
	Cramer's V	,250	,001
N of Valid Cases		184	

Perceived behavioural control * intended mode of transport

Table 71: Crosstab - Intended mode of transport * perceived behavioural control Airplane

			Intended travel mode choice				Total
			Airplane	Train	Car	Bus	
Perceived behavioural control Airplane	Positive	Count	33_a	66_b	15_b	9_b	123
		% column	97,1%	60,6%	65,2%	50,0%	66,8%
	Neutral	Count	1_a	21_a	6_a	3_a	31
		% column	2,9%	19,3%	26,1%	16,7%	16,8%
	Negative	Count	0_a	22_b	$2_{a, b}$	6_b	30
		% column	0,0%	20,2%	8,7%	33,3%	16,3%
Total		Count	34	109	23	18	184
		% column	100,0%	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Intended travel mode choice categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 72: Cramer's V - Intended mode of transport * perceived behavioural control Airplane

		Value	Approximate Significance
Nominal by Nominal	Phi	,346	,001
	Cramer's V	,245	,001
N of Valid Cases		184	

Table 73: Crosstab - Intended mode of transport * perceived behavioural control Train

			Intended travel mode choice				Total
			Airplane	Train	Car	Bus	
Perceived behavioural control Train	Positive	Count	20_a	102_b	12_a	$14_{a,b}$	148
		% column	58,8%	94,4%	52,2%	77,8%	80,9%
	Neutral	Count	11_a	2_b	4_a	3_a	20
		% column	32,4%	1,9%	17,4%	16,7%	10,9%
	Negative	Count	$3_{a,b}$	4_b	7_a	$1_{a,b}$	15
		% column	8,8%	3,7%	30,4%	5,6%	8,2%
Total		Count	34	108	23	18	183
		% column	100,0%	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Intended travel mode choice categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 74: Cramer's V - Intended mode of transport * perceived behavioural control Train

		Value	Approximate Significance
Nominal by Nominal	Phi	,509	,000
	Cramer's V	,360	,000
N of Valid Cases		183	

Table 75: Crosstab - Intended mode of transport * perceived behavioural control Car

			Intended travel mode choice				Total
			Airplane	Train	Car	Bus	
Perceived behavioural control Car	Positive	Count	14_a	52_a	22_b	8_a	96
		% column	41,2%	49,5%	95,7%	50,0%	53,9%
	Neutral	Count	8_a	20_a	0_a	2_a	30
		% column	23,5%	19,0%	0,0%	12,5%	16,9%
	Negative	Count	12_a	33_a	1_b	6_a	52
		% column	35,3%	31,4%	4,3%	37,5%	29,2%
Total		Count	34	105	23	16	178
		% column	100,0%	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Intended travel mode choice categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 76: Cramer's V - Intended mode of transport * perceived behavioural control Car

		Value	Approximate Significance
Nominal by Nominal	Phi	,335	,003
	Cramer's V	,237	,003
N of Valid Cases		178	

Table 77: Crosstab - Intended mode of transport * perceived behavioural control Bus

			Intended travel mode choice				Total
			Airplane	Train	Car	Bus	
Perceived behavioural control bus	Positive	Count	12_a	63_a	9_a	17_b	101
		% column	37,5%	58,3%	39,1%	94,4%	55,8%
	Neutral	Count	3_a	21_a	5_a	0_a	29
		% column	9,4%	19,4%	21,7%	0,0%	16,0%
	Negative	Count	17_a	24_b	$9_{a, b}$	1_b	51
		% column	53,1%	22,2%	39,1%	5,6%	28,2%
Total		Count	32	108	23	18	181
		% column	100,0%	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Intended travel mode choice categories whose column proportions do not differ significantly from each other at the ,05 level.

Table 78: Cramer's V - Intended mode of transport * perceived behavioural control Bus

		Value	Approximate Significance
Nominal by Nominal	Phi	,377	,000
	Cramer's V	,266	,000
N of Valid Cases		181	

Intended transport mode * actual transport mode between 2018 and May 2019

Table 79: **Intended transport mode * actual transport mode between 2018 and May 2019**

			Intended transport mode choice				Total
			Airplane	Train	Car	Bus	
Actual transport mode choice between 2018 and May 2019	Airplane	Count	23$_a$	9$_b$	0$_b$	0$_b$	32
		% column	71,9%	9,4%	0,0%	0,0%	19,6%
	Train	Count	2$_a$	69$_b$	5$_a$	1$_a$	77
		% column	6,3%	71,9%	25,0%	6,7%	47,2%
	Car	Count	3$_a$	3$_a$	11$_b$	1$_a$	18
		% column	9,4%	3,1%	55,0%	6,7%	11,0%
	Bus	Count	2$_a$	7$_a$	1$_a$	11$_b$	21
		% column	6,3%	7,3%	5,0%	73,3%	12,9%
	Else	Count	2$_a$	8$_a$	3$_a$	2$_a$	15
		% column	6,3%	8,3%	15,0%	13,3%	9,2%
Total		Count	32	96	20	15	163
		% column	100,0%	100,0%	100,0%	100,0%	100,0%

Each subscript letter denotes a subset of Intended travel mode choice categories whose column proportions do not differ significantly from each other at the ,05 level.

APPENDIX E: INTERVIEW SCHEMES

Interview Bram van Montfoord

Specific variable	Document context
Socio-demographic information	Man, 31 years old, residence in Amsterdam, single
Motivation to travel	To visit friends in Berlin, several times per year
Most preferred travel mode choice	Train
Advantages and disadvantages of the mode	Advantages: The interviewee found it relaxed, there is a lot of space, he can walk around the train, there is an on-board bistro, he can work on the train, there is no big security control as on the airplane, he can cycle to Amsterdam Central station, so it is ease to reach. "Ik woon dicht bij Amsterdam centraal, dus het is voor mij heel handig." "Ik vind het fantastisch om in de trein te zitten. Het is lekker ontspannen en je hebt meer beenruimte. Je kunt lekker rondlopen en je hebt de bordbistro, ook al kan die nog wel een stukje beter. Ik kan werken. Ik heb een hekel aan secure op airports en dat heb je ook niet met de trein. Ik woon dicht bij Amsterdam centraal, dus het is voor mij heel handig." Disadvantages: The amount of in-between stops at small towns are slowing the train down, the workers on the train barely speak English, especially in the on-board bistro are bad, the inferior quality of the Wi-Fi
Opinion on the other modes	Airplane: This could be taken as alternative when I'm booking very last minute due to train prices and because it is faster. It would be less of an appealing option if the Wi-Fi on the train would be working. Car: Not an option, because the person has no driver's licence. Bus: The interviewee tried this two times, but it's taking even more time, however it is really cheap.
Subjective norm	This person prefers the train even more when travelling with a group, because it is well arranged to sit together. People in certain circles this person knows in Amsterdam are really looking down on the airplane, but besides from Amsterdam many people are less negative about it in his experience. "Dus het is maar net in wat voor wereldje. Ik durf het eigenlijk bijna niet meer te zeggen als ik naar Berlijn vlieg."
Information access and ease of planning	This person thinks the NSinternational webpage is not user-friendly and NS could learn a lot from the way it is done for

	airlines. During the trainride he thinks there are too many calls along the way from the conductor. Also during delays there should be an improved way of informing the passengers for example with an automatic email sending their best travel options due to the delay. "Het werk gewoon niet handig, vergeleken met websites van vliegmaatschappijen."
How to improve the current railway situation	More direct and faster connections. Subsides trains more and airplanes less.

Interview Yvette Schuijt

Specific variable	Document context
Socio-demographic information	Female, 25 years old, residence in Amsterdam, single, recently graduated as a law student,
Motivation to travel	To visit friends, several times per year
Most preferred travel mode choice	Car
Advantages and disadvantages of the mode	Advantages: This person likes to decide last-minute to go to Berlin and the car is the easiest option. She likes it because she is independent and doesn't need to be somewhere on time. It is possible to take any route you feel like. It makes visiting places nearby Berlin easier. Disadvantages: It takes a lot of energy to drive. Besides, she has to borrow a car from her parents, because she doesn't own one. If not possible, she tries to go using blablacar.
Opinion on the other modes	Airplane: This is unnecessary and it causes too much environmental damage. She thinks it is stressful due to all the security and the need to be on time, also you can bring only a small amount of luggage. "Kijk oké de auto is niet goed voor het milieu maar vliegen is nog slechter." Train: This is too expensive on a last-minute notice. Bus: This takes too much time.
Subjective norm	This person is not sure about the status of certain transport modes. Everybody should just go how they like to.
Information access and ease of planning	She thinks it is really easy to plan with the car, also using blablacar is easy.
How to improve the current railway situation	Mainly the prize for last-minute tickets should be reduced for her in order to take the train.

Interview Toon Savelkoul

Specific variable	Document context
Socio-demographic information	Man, 27 years old, residence in Berlin, single, works for a German company for the Dutch customer service

Motivation to travel	Emigration and visiting friends and family, several times per year
Most preferred travel mode choice	For the emigration the car, otherwise the train of the airplane
Advantages and disadvantages of the mode	Train, advantage: When planning in advance, most of the times it is cheaper. Because the person's parents live in Limburg close to the border, travel time is not much longer than the airplane. Airplane, advantage: It could be the quickest and only way when travelling in the evening "Soms dan ga ik s avonds na werk en dan kan ik eigenlijk alleen maar het vliegtuig nemen." Train, disadvantage: It is a long ride on which this person could get bored. Airplane, disadvantage: It could be more expensive than the train.
Opinion on the other modes	Car: It is convenient to take a lot of luggage with. Bus: It is the inferior option and this person heard a lot of negative stories about it.
Subjective norm	Many people in this person's environment have a negative attitude towards the bus. Most friends and family would come by car. The train or the airplane are considered equally comfortable. His environment doesn't take the climate debat into account.
Information access and ease of planning	This person thinks the web page of NSinternational is badly organised and he misses the option to choose your seat. "Wat ik echt irritant vind aan de trein is dat je via NSinternational moet boeken, wat een slecht georganiseerde website is."
How to improve the current railway situation	To fasten the connection, so it becomes a more interesting choice when time is limited

Interview Nicolle Wolvenne

Specific variable	Document context
Socio-demographic information	Female, 68 years old, residence in Arnhem, retired, volunteer at several cultural institutions, married and has 3 children
Motivation to travel	Holiday and participating in everyday life of Berlin, once or twice per year
Most preferred travel mode choice	Car
Advantages and disadvantages of the mode	Advantages: Being able to bring much luggage for comfort reasons and the person's own bikes. Also, it is the cheapest option in her opinion.

	Disadvantages: It is hard to find good parking spots in Berlin
Opinion on the other modes	Train: It is not possible to bring as much with you as when you travel by car. It takes a long time. "ja dat durf ik bijna niet te zeggen, maar zelf de dochter van een spoor man dus ik heb vroeger een leven lang in de trein gezeten, maar ik vind die trein zo duur. Ja en soms zo lang duren en dat vind ik zo slecht." Airplane: It is even worse than the train looking at what is possible to bring luggage-wise. From Arnhem it is takes a lot of time to reach an airport that offers a connection with Berlin.
Subjective norm	Some people in the environment of this person think that they should not do all these trips by car, but instead that they should take the train. "ik heb ook maar mensen die het niet vinden kunnen dat wij dat altijd maar met de auto doen. Van sommigen moet je het eigenlijk met de trein doe dus als we het over over energie en groen en zo hebben dan is deze status van de auto laag."
Information access and ease of planning	In her opinion travelling by car is really easy, because you can decide everything yourself
How to improve the current railway situation	It should be cheaper and faster.

Interview Joost Nussy

Specific variable	Document context
Socio-demographic information	Man, residence in Groningen, recently graduated as cultural geography, single, city-tour guide, active member of the European wide student association AEGEE.
Motivation to travel	Passing through, several times per year
Most preferred travel mode choice	Bus
Advantages and disadvantages of the mode	Advantages: The bus is a direct connection from Groningen. It is affordable. It is more sustainable than flying. It is possible to take a night-bus, thus making use of the night. The bus stop is at cycling distance from his home. The bus stops in the city centre of Berlin. "Dat is echt 10 minuutjes fietsen vanaf mijn huis." Disadvantages:
Opinion on the other modes	Train: The connection between Groningen and Berlin is really bad looking at the train, there are many changes. Also it is expensive, especially last-minute. "Ja ja vanaf Groningen is die connectie gewoon niet echt. Ik weet niet, dan kom ik gewoon gelijk eigenlijk uit op de

	flixbus, omdat het lekker direct is. Maar goed dat heb je dus niet bij de trein dus ja."
	Airplane: This option is not necessary and unsustainable.
	Car: This is not an option, because he does not have a driver's license. He would consider it if he would have one.
Subjective norm	Many people in his environment would choose the bus. It is a direct connection and affordable. Also, many friends of him do not have a driver's license. "ja in Groningen het gewoon wel, of in ieder geval om de mensen die ik ken, is ook de Flixbus wel een soort van, ja raar om te zeggen, algemeen geaccepteerd." On the other hand it is consider uncomfortable. The train and the airplane are seen as more luxurious. He does not experience much judgements for travelling unsustainably when he flies to a destination. Hitchhiking is also an option for his friends.
Information access and ease of planning	With Flixbus he believes you need a flexible mind-set, because the bus could be an hour late for example. Also the exact location of the stops in Berlin are not clear when booking a ticket. Besides, the Wi-Fi on board is not always working well.
How to improve the current railway situation	By being more affordable and having more direct connections from Groningen.

Interview Arthur Augustijn

Specific variable	Document context
Socio-demographic information	Man, 35 years old, single, residence in Rotterdam, freelancer
Motivation to travel	Business and visiting friends, monthly "ik blijf ook altijd een weekend over gewoon om vrienden en zo te zien hier."
Most preferred travel mode choice	Airplane
Advantages and disadvantages of the mode	Advantages: It is the quickest way to get to Berlin. It is the most affordable option when planning one week ahead. Disadvantages: It has a big environmental impact. "eigenlijk de laatste tijd alleen maar met het vliegtuig en ik weet ook wel dat is heel slecht enzo... maar het scheelt zoveel tijd."
Opinion on the other modes	Train: This person used to go by train, but it is taking too much time for him. Also, it is too expensive when last-minute booking. "De tijd is gewoon veel te lang naar Berlijn toe, want je bent gewoon zes uur, vanuit Rotterdam 7 uur, onderweg."

	"En de kosten ook wel als ik naar Berlijn ga en ik kan. Ik bedoel een retourtje en ik het boek zeg maar niet drie maanden van tevoren, want ik weet dan nog niet wanneer ik wegga. Dus eigenlijk is het vaak een week van tevoren dan ben je bij de NS vaak wel 170 euro kwijt.."
	Car: The car is useless in Berlin and it is too difficult to find a parking spot.
	Bus: This is the most uncomfortable option.
Subjective norm	Within is circle of acquaintances he has discussions on the topic of which transport mode they should chose, but because everyone travels a lot, they all agree on flying is the only realistic option, despite the environmental impact. Especially the bus is seen as an uncomfortable mode, when looking at the airplane, the train and the car.
Information access and ease of planning	For both the train and the airplane he is alright with the current situation.
How to improve the current railway situation	Decrease travel time between Amsterdam and Berlin to 3 – 3,5 hours. A well-functioning Wi-Fi connection would also help to be able to use the time productively.

Interview Sip Grafhorst

Specific variable	Document context
Socio-demographic information	Man, 68 years old, residence in The Hague, divorced, retired
Motivation to travel	To visit his daughter who is living there, several times per year
Most preferred travel mode choice	Car, airplane and the train
Advantages and disadvantages of the mode	Car, advantages: It is affordable. Only when carpooling. Car, disadvantage: Due to his age and health condition he cannot drive from The Hague to Berlin on his own anymore.
	Airplane, advantages: It is affordable and it is quick. Airplane, disadvantages: Due to his thrombosis the person is not sure whether it is smart to take the airplane. Also, before he could go from Rotterdam-The Hague airport and now he needs to go to Schiphol. He is also aware that flying has a lot of environmental impact.
	"Een paar jaar geleden is een discussie gestart er moet een vliegtax komen, maar toen was het niet haalbaar. Ondertussen zijn er in Europa meer landen met een vliegtax dan zonder een vliegtax. Ik zeg dan haal het nu weer van stal."
	Train, advantages: It is the most favourable looking at his health conditions,

	Train, disadvantages: It is taking a long time to first get to the train to Berlin, then the 6,5 hour train ride to Berlin. The train station is far away. It is expensive and difficult to find affordable tickets.
	"Ja nou ik vind ehm prijstechnisch vind ik de trein een beetje tegengevallen. Het is in sommige gevallen is het soms duurder dan vliegen en dan denk ik van ja, want je zit er wel nou ja minstens 6 en een half uur eigenlijk moet ik zeggen vanaf Den Haag zevenenhalf uur in en dan vind ik het best wel lang en dan voor zo'n prijs."
Opinion on the other modes	-
Subjective norm	His daughter went by train and was positive about it. Other people from his environment would go by car or take the airplane.
Information access and ease of planning	It is difficult and in transparent to find affordable train tickets. "Ik vind het vinden van een goedkope treinreis, vind ik toch eigenlijk best lastig. Dan blijkt ook weer dat als je via de NS boekt, dan krijg je toch wel weer een ander tarief dan als dat via DB boekt om maar wat te noemen." For flying this is way easier in the experience of this person. During the trip everything is easy to find, as well as for flying, or taking the train. Also, going by car is rather easy.
How to improve the current railway situation	There should be less stops in-between and the connection should be faster, most preferably high speed rail and it should make a statement to show off that then the train is always faster than the car for example and the train station is in the middle of the city-centre. There should be one stop in the Netherlands with affordable parking so it is easy to get on the train. There should be an introduction on flight tax, because flying is too cheap.