NHL HOGESCHOOL

University of Chester

Comparison of intrinsic motivations for cycling

Thesis research by H.K. Lenting

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	semester 8, 2014

Preface

I am not just a Dutch traffic engineering student who thinks he knows more about cycling than you do just because he is from the Netherlands. I have been trying to specialize my education towards cycling for a while, also doing an internship and research at the Dutch Cycling Council (Fietsberaad). I am not just a traffic engineering student, I am a person who loves to ride bicycles of all types for all kinds of reasons and has therefore seen a lot of possibilities in making cycling safer. And because I ride for a variety of reasons myself, I can identify better with people who ride for different reasons.

In executing this research, I learned how closely traffic engineering is related to sociology, and how many insights sociology can offer to this subject, while traffic offers an interesting field of study for sociologists. I also learned what it means to cycle somewhere quite different from what I was used to, and I'm not even talking about hilliness or the fact that people drive on the wrong side of the road here in England.

My personal background may sometimes influence my interpretation of data. Although I have constantly fought to keep an open mind, it is very possible that at a number points in this document, you may find yourself reminded that the author is an enthusiast himself.

I want to thank everyone for their support by thinking along, offering advice or just by being themselves.

Henk Lenting, June 2014

Summary

All over the world, towns and cities are starting to see cycling as a good solution to environmental and spatial problems. Chester is one of many possible examples. In order to get people to cycle, it is important to know what drives people to start cycling. To be able to learn from other countries, we need to know where these motivations differ from each other and why.

In order to answer the question: "Where do intrinsic motivations for cycling in Chester (UK) differ from those motivations in a comparable Dutch town, how can these differences be explained and how can they be used?" questionnaires and interviews have been executed in Chester and Leeuwarden. A total of 335 valid questionnaires were filled out, 150 in Chester and 185 in Leeuwarden, in each country six interviews were held to solidify data gained from the questionnaires.

Intrinsic motivations are in essence the motivations that lie beneath the surface of the first explanation people might give when asked why they cycle. Someone might answer this by saying: "because I don't own a car" and be done with it. This research digs deeper into the "why" or "why not".

Theory

From a review of available scientific literature, a long list of potentially influential factors was compiled. All of these factors were grouped according to the aspect of cycling they relate to. First into two categories: factors relating to the physical environment the behaviour takes place in and its inherent characteristics, and factors relating to a person and his or her social environment. The first group was subdivided into three groups:

- The characteristics of the trip, relating to trip-specific physical characteristics;
- The circumstances of the trip, the non-infrastructural characteristics of the trip;
- The background of the trip, background characteristics that cannot really be changed.

The second group of factors, containing personal and social factors was subdivided into two groups:

- Personal background, factual personal and social background information;
- Personal image and influence of the social environment on a person.

Each factor can either be encouraging, discouraging or have no influence since not all factors are necessarily of positive or negative influence. Placing the factors in Ajzen's model of planned behaviour (1991) shows that some groups of factors form intentions for cycling, while most of them work as barriers, positively or negatively, see figure S.1. For the behaviour to take place, personal factors (the last two groups) have to form a positive attitude towards cycling, before factors that work as barriers come into play.

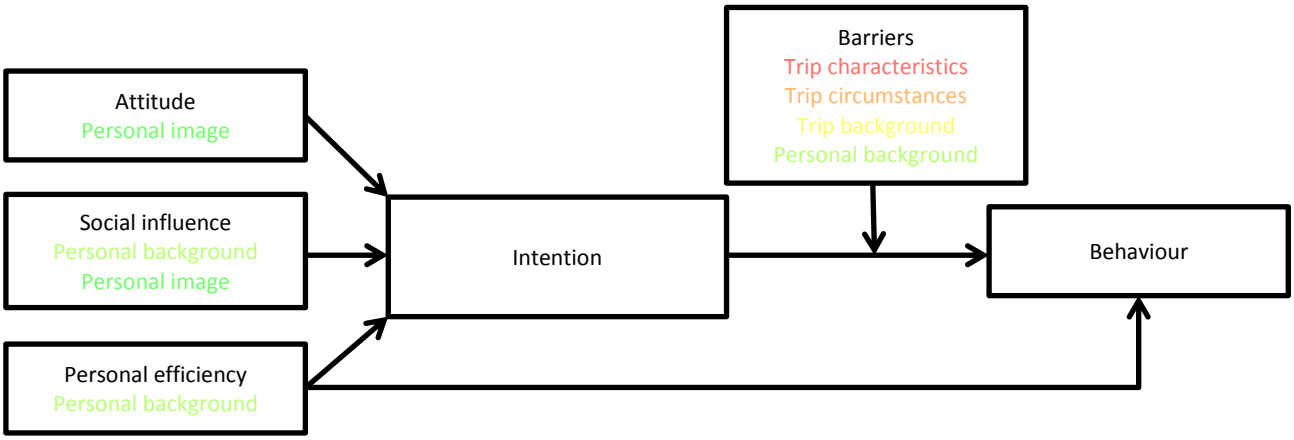


Figure S.1: Factor groups within Theory of Planned Behavior (Ajzen, 1991)

Differences

Table S.1 gives an overview of all factors identified in this research in column 1, the second and third columns show how each factor was scored in the UK and the Netherlands. It shows if the scoring was mostly on the encouraging side (positive), if it was mostly neutral (no influence) or if it was mostly discouraging (negative), "wide" indicates that there is no clear pattern in the answers given by the

respondents. To give it a little nuance, some variations on this broad characterisation were used where necessary. A complete overview of all factors and the scoring for them is included in appendix 5. The final column shows if there was a statistically significant difference in the mean values of the scores for each country. Five of the factors were found to be unclear in the questionnaire, even though clear instructions were given. These five factors are included in the table in grey text.

Table S.1: Factors and differences between UK and NL including significance

Trip characteristics	***UK***	***NL***	***Significance***
Location of trip origin within network	wide	positive	sign.
Coherence / continuity of infrastructure	negative	wide	sign.
Trip distance	wide	wide	
Trip duration	wide	wide	
Type and quality of cycling infrastructure	wide	no big influence	sign.
Shared or segregated infrastructure	negative	no influence	sign.
Perceived active safety	negative	wide / no infl.	sign.
Perceived passive safety (parking)	wide / positive	positive	sign.
Shower and dressing facilities at destination	no big influence	no influence	sign.
Price versus other modes of transport	slightly positive	slightly positive	
Trip circumstances			
Trip purpose	negative	positive	
Fellow travellers	no influence	no influence	
Need to bring luggage and type of luggage	negative	negative	
Dependence or independence	positive	positive	
Freedom in travel times	positive	positive	
Restrictions by work	no influence	no influence	
Trip background			
Function diversity of surroundings	no influence	no infl. / positive	
Attractiveness of surroundings	positive	more positive	
Hilliness	wide	no influence	
Good weather	positive	very positive	
Bad weather	negative	negative	
Hours of daylight	wide	positive	
Personal background			
Bike ownership	positive	positive	
Bike rideability	positive	positive	
Car ownership	wide	wide	
Physical ability	wide / positive	wide / positive	
Personal image			
Attitudes towards car	no big influence	no infl. / positive	
Attitudes towards public transport	no big influence	no influence	
Attitudes towards walking	no influence	no big influence	
Perceived ability	no influence	no infl. / positive	
Support family	no influence	no big influence	
Support university / workplace	no influence	no influence	
Ordinary	no influence	no influence	
Physically active (self-image)	positive	positive	
A cyclist (self-image)	no influence	no big influence	
Altruistic & ecologic mindedness	very positive	positive	
Image and goals in health, fitness and weight loss	very positive	positive	
Habits	no big influence	positive	sign.

The location of the trip origin within the cycling network, coherence of the network, type and quality of infrastructure and shared or segregated paths are all significantly better in the Netherlands because there is a better network of cycling infrastructure there. Some of these have been scored as having no influence, which shows that once these factors are satisfactory, they do not discourage people from cycling anymore, but they do not encourage them either.

Safety while cycling is not an issue in the Netherlands, which leads people to be able to enjoy themselves more while cycling. The differences in influence of weather, function diversity of the surroundings of a trip (i.e. having shops and pubs around) and health benefits show that cycling in the UK is seen as a sport first and as a mode of transportation second. This also explains why shower facilities are more influential there. Cycling in England is mainly done by enthusiasts for whom it is a lifestyle, a sport and a mode of transport all in one, and in that order.

Findings

The most important findings of this research are:

- Cycling has to be salient (it has to be in someone's mind as an option) before any other factors come into play: people have to see it as an option first;
- Safety issues are partially due to infrastructure, partially driver attitude and partially familiarity.;
- A number of factors increase in importance when safety stops being a major issue, this is at least the case for relaxation and enjoyment of surroundings while cycling;
- A bike is a lifestyle for most in Britain, it is a tool for most in the Netherlands;
- There are some important differences between how people who don't cycle view cycling and how people who do cycle find it, cyclists have more appreciation for the feeling of freedom while cycling and for the price difference with other modes of transport than people who do not cycle;
- There are a number of factors that can discourage someone from cycling, but can never really encourage. This research has found this to be the case for type and quality of infrastructure, attitudes towards cars, public transport & walking, having the skills and fitness required and support from family or university;
- A better cycling network and better safety does not improve independence.

Application

The knowledge generated by this research can be applied to generate useable advice for the situation in England as well as the situation in the Netherlands.

The first piece of advice is to get people to see cycling as an option for them: even if it is not a viable option at that time, cycling should at least become part of the equation. This is closely related to the second thing learned here. To get more people cycling, people have to see that cycling is not just something for enthusiasts. So show how a bicycle can be useable as a tool that does not require the whole lifestyle currently surrounding it.

Very important for cycling in England is improving safety. This is something that requires a systematic approach in three simultaneous measures. The network of bicycle infrastructure has to be improved and built according to a vision that includes priorities rather than having a network that grows only when opportunities arise. Public attitude towards cyclists has to change by showing how little it costs for a driver to interact sensibly with cyclists, or by having drivers experience what it's like to cycle in a hostile environment. Related to that, drivers have to become familiar with sharing the road with cyclists. When a driver does not expect a cyclist and does not know how to behave around one, dangerous situations arise easily. This should be tackled by campaigns and in extreme cases by placing reminders alongside or on the road to show that a driver can expect a cyclist.

In the Netherlands, framing cycling as a sport can be used to promote cycling long distances to and from work. When cycling is viewed as exercise rather than just a slow mode of transportation, cycling longer distances becomes more attractive since a longer distance equals a better training. Specific audiences should be shown the health benefits from cycling as an active mode of transportation.

Cyclists in the Netherlands were quite pleased with the ease of running errands while cycling somewhere. Promoting this feature of cycling may also tip the scale for people to make the decision to start cycling.

Dutch Summary (Nederlandse Samenvatting)

Steeds meer steden over de hele wereld zien de fiets als een goede oplossing voor ecologische en ruimtelijke problemen. Chester (in Engeland) is een van de vele mogelijke voorbeelden. Om mensen aan het fietsen te krijgen is het belangrijk om te weten wat mensen er toe beweegt om voor de fiets als vervoermiddel te kiezen. Om als landen van elkaar te kunnen leren moeten we weten waar deze motivaties van elkaar verschillen en waarom.

Om de vraag: "Waarin verschillen intrinsieke motivaties om te gaan fietsen in Chester met deze motivaties om te fietsen in een vergelijkbare Nederlandse stad, hoe kunnen deze verschillen worden uitgelegd en hoe kunnen ze worden toegepast?" te kunnen beantwoorden zijn enquêtes en interviews gehouden in Chester en in Leeuwarden. In totaal zijn 335 valide enquêtes afgenomen, 150 in Chester en 185 in Leeuwarden. In elk land zijn zes interviews gehouden waarmee de resultaten van de enquêtes zijn ondersteund.

Intrinsieke motivaties zijn in essentie de motivaties die onder het oppervlak liggen van de eerste verklaring die mensen geven als ze worden gevraagd waarom ze fietsen. Iemand zou deze vraag kunnen beantwoorden met: "Omdat ik geen auto heb" en het daar bij laten. Dit onderzoek gaat dieper in op het waarom of waarom juist niet.

Theorie

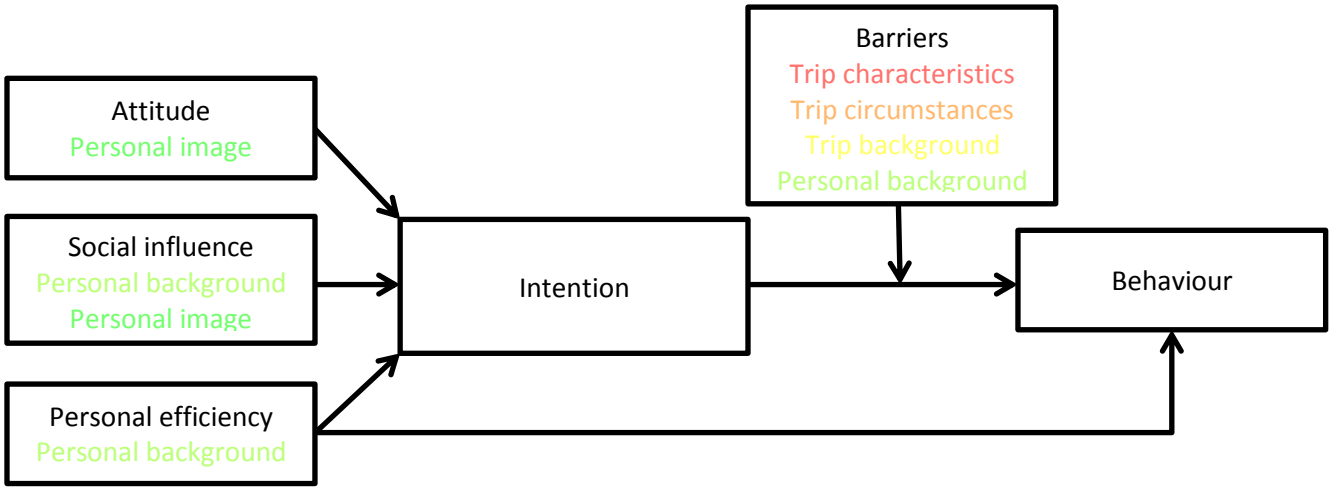
Uit literatuuronderzoek is een lange lijst samengesteld van factoren die mogelijk van invloed kunnen zijn op de keuze om wel of niet te fietsen. Al deze factoren zijn gegroepeerd aan de hand van de aspecten van fietsen waar de factoren op aangrijpen. In eerste instantie in twee categorieën: factoren die gaan over de fysieke omgeving van het gedrag en de karakteristieken die daar mee samenhangen en factoren die iets zeggen over de persoon en diens sociale omgeving. De eerste categorie is vervolgens verdeeld in drie groepen:

- De karakteristieken van de reis, die slaan op fysieke karakteristieken specifiek aan de reis gerelateerd;
- De omstandigheden van de reis, dat wil zeggen, de niet-infrastructurele karakteristieken van de reis;
- De achtergrond van de reis, achtergrondomstandigheden waar weinig aan te veranderen valt.

De tweede groep factoren, die over persoonlijke en sociale factoren gaan is onderverdeeld in twee groepen:

- Persoonlijke achtergrond, feitelijke persoonlijke en sociale achtergrondinformatie;
- Zelfbeeld en de invloed van de sociale omgeving op een persoon.

Elke factor kan ontmoedigend of bemoedigend zijn, of geen invloed hebben, het is immers niet zeker dat alle factoren überhaupt van belang zijn. Door deze groepen te plaatsen in Ajzen's model van gepland gedrag (1991) wordt duidelijk dat sommige groepen factoren bijdragen aan het vormen van de intentie om te fietsen, terwijl andere groepen in positieve of negatieve zin als barrière werken. Dit is te zien in figuur S.1. Om het gedrag te laten plaatsvinden moeten de persoonlijke factoren (de laatste twee groepen) zorgen voor een positieve attitude ten opzichte van de fiets, pas dan komen de factoren die als barrière in het model staan aan bod.



Figuur S.1: Factor groepen binnen de Theory of Planned Behavior (Ajzen, 1991)

Verschillen

Tabel S.1 geeft in de eerste kolom een overzicht van alle factoren die uit het literatuuronderzoek naar voren zijn gekomen, kolom twee en kolom drie geven aan welke scores gegeven zijn aan de factoren in Engeland en in Nederland. Hier staat aangegeven of er vooral aan de bemoedigende kant is gescoord (positief), of er vooral neutraal is gescoord (geen invloed) of dat er vooral ontmoedigend (negatief) is gescoord. "Breed" geeft aan dat er geen duidelijk patroon in de gegeven scores aanwezig is. Om deze vier categorieën iets te nuanceren zijn waar nodig varianten van deze categorieën gebruikt. Een volledig overzicht (in het Engels) van alle factoren en hoe hierop gescoord is, is te vinden in appendix (bijlage) 5. De laatste kolom geeft aan of er een statistisch significant verschil is tussen de gemiddelde waarden van beide landen voor elke factor. Vijf van de factoren bleken onduidelijk in de enquête, ondanks duidelijke instructies, deze factoren zijn in grijze tekst in de tabel opgenomen en verder niet gebruikt in de verwerking.

Tabel S.1: Factoren en de verschillen tussen Engeland en Nederland inclusief significantie.

Reis karakteristieken	***UK***	***NL***	***Significantie***
Locatie van herkomst ten opzichte van netwerk	breed	positief	sign.
Samenhang van het netwerk	negatief	breed	sign.
Reis afstand	breed	breed	
Reisduur	breed	breed	
Soort en kwaliteit infrastructuur	breed	niet veel invloed	sign.
Gedeelde of gescheiden infrastructuur	negatief	geen invloed	sign.
Subjectieve veiligheid tijdens het fietsen	negatief	breed / geen invl.	sign.
Subjectieve veiligheid bij parkeren	breed / positief	positief	sign.
Douche en omkleed mogelijkheid op bestemming	niet veel invloed	geen invloed	sign.
Prijs in vergelijking met andere vervoersmiddelen	licht positief	licht positief	
Reis omstandigheden			
Reisdoel	negatief	positief	
Medereizigers	geen invloed	geen invloed	
Bagage mee moeten nemen (en soort bagage)	negatief	negatief	
Afhankelijk of vrij zijn	positief	positief	
Vrijheid in reistijden	positief	positief	
Restricties door werk	geen invloed	geen invloed	

Reis achtergrond			
Veelzijdigheid van de omgeving	geen invloed	geen invl. / pos.	
Aantrekkelijkheid van de omgeving	positief	erg positief	
Heuvelachtigheid	breed	geen invloed	
Goed weer	positief	erg positief	
Slecht weer	negatief	negatief	
Uren daglicht	breed	positief	
Persoonlijke achtergrond			
Mijn fiets	positief	positief	
Bruikbaarheid fiets	positief	positief	
Hebben van een auto	breed	breed	
Fysieke gesteldheid	breed / positief	breed / positief	
Zelfbeeld			
Houding t.o.v. autogebruik	niet veel invloed	geen invl. / pos.	
Houding t.o.v. OV gebruik	niet veel invloed	geen invloed	
Houding t.o.v. lopen	geen invloed	niet veel invloed	
Ingeschatte vaardigheid	geen invloed	geen invl. / pos.	
Steun van familie	geen invloed	niet veel invloed	
Steun van universiteit / werkplek	geen invloed	geen invloed	
Dat fietsen gewoon of juist raar is	geen invloed	geen invloed	
Fysiek actief (zelfbeeld)	positief	positief	
Een fietser (zelfbeeld)	geen invloed	niet veel invloed	
Milieubewustheid	erg positief	positief	
Gezondheid	erg positief	positief	
Huidige gewoonte	niet veel invloed	positief	sign.

De locatie van de herkomst ten opzichte van het fietsnetwerk, samenhang van het netwerk, soort en kwaliteit van de infrastructuur en gedeelde of gescheiden ruimte zijn allemaal significant beter gescoord in Nederland doordat hier een beter fietsnetwerk ligt. Op sommige van deze factoren is vooral gescoord dat ze geen invloed hebben, dit laat zien dat deze factoren goed genoeg gevonden werden, ze ontmoedigen mensen niet om te gaan fietsen, maar hoe goed ze ook zijn, bemoedigend worden ze niet.

Veiligheid tijdens het fietsen is geen issue in Nederland, hierdoor kunnen mensen meer genieten van het fietsen. De verschillen in invloed van weersomstandigheden, veelzijdigheid van de omgeving (winkels en terrasjes in de buurt hebben) en gezondheidseffecten laten zien dat fietsen in Engeland in eerste instantie als sport wordt gezien, en in tweede instantie pas als vervoermiddel. Dit verklaard ook waarom douchevoorzieningen belangrijker worden gevonden. Fietsen wordt in Engeland vooral gedaan door enthousiastelingen voor wie het een levenswijze, een sport en een vervoersmiddel is, in die volgorde.

Bevindingen

De belangrijkste bevindingen van dit onderzoek zijn:

- Fietsen moet eerst saillant zijn (het moet in het hoofd zitten als optie) bij mensen voordat andere factoren een rol gaan spelen: mensen moeten fietsen eerst als optie gaan zien;
- Onveiligheid kan deels worden opgelost met infrastructuur, deels door attitudes van automobilisten aan te pakken en deels door automobilisten bekender te maken met omgaan met fietsers;
- Een aantal factoren worden belangrijker als veiligheid geen issue meer is, dit is ten minste het geval voor ontspanning en het kunnen genieten van de omgeving tijdens het fietsen;

- Voor de meeste fietsers in Engeland is de fiets een levenswijze, voor de meeste fietsers in Nederland een gebruiksvoorwerp niet meer dan een vervoerswijze;
- Er zijn belangrijke verschillen tussen hoe mensen die niet fietsen tegen het fietsen aankijken en hoe mensen die wel fietsen het vinden. Fietsers hechten meer waarde aan het gevoel van vrijheid tijdens het fietsen en vinden de prijsverschillen met andere vervoerswijzen belangrijker dan niet-fietsers;
- Een aantal van de factoren uit dit onderzoek kunnen mensen wel ontmoedigen, maar nooit echt bemoedigen. De factoren waarvan dat in dit onderzoek duidelijk is geworden zijn: soort en kwaliteit van infrastructuur, houding ten opzichte van andere vervoersmiddelen, het hebben van de benodigde vaardigheden en fitheid en steun van familie en universiteit;
- Een beter fietsnetwerk en betere veiligheid zorgt niet voor een groter gevoel van vrijheid tijdens het fietsen.

Toepassing

De kennis die is opgedaan met dit onderzoek kan worden toegepast om zo bruikbaar advies voor de Engelse en de Nederlandse situatie te kunnen geven.

Het eerste advies is: laat mensen er achter komen dat fietsen ook voor hen een optie is, ook al is het op dat moment misschien geen goede optie, zodra fietsen onderdeel van de vergelijking wordt heb je al vooruitgang geboekt. Hier hangt het tweede advies sterk mee samen, wil je meer mensen aan het fietsen krijgen, dan moeten mensen zien dat fietsen niet alleen iets is voor fanatiekelingen. Laat zien dat de fiets ook een nuttig vervoermiddel kan zijn, waar niet per se een hele andere levensstijl mee gepaard gaat.

Belangrijk voor het fietsen in Engeland is het verbeteren van de veiligheid. Dit vraagt een systematische aanpak in drie sporen die tegelijkertijd moeten lopen. Het netwerk van fietsinfrastructuur moet verbeterd worden, en dit moet gebeuren aan de hand van een visie en een prioritering van die visie, niet door alleen maar schakels aan het netwerk toe te voegen als daar toevallig gelegenheid toe is. De publieke houding ten opzichte van fietsers moet bovendien veranderen, door te laten zien hoe weinig het kost om fatsoenlijk met een fietser in het verkeer om te gaan, of door automobilisten te laten ervaren hoe het is om in een vijandige omgeving te moeten fietsen. Hiermee verbonden moeten automobilisten bovendien vertrouwder worden met het delen van ruimte met fietsers. Dit begint met het verwachten van fietsers op de weg, want als een fietser niet verwacht wordt door een automobilist en deze bovendien niet weet hoe om te gaan met een fietser, kunnen snel gevaarlijke situaties ontstaan. Dit moet worden aangepakt met campagnes en in uitzonderlijke gevallen door langs en op de weg reminders te plaatsen, om de automobilist er aan te herinneren dat fietsers hier te verwachten zijn.

In Nederland kan heel wat gewonnen worden door het fietsen van een lange afstand naar het werk ook als sportieve bezigheid te gaan zien. Als je fietsen bekijkt als training in plaats van als langzaam vervoermiddel wordt het extra aantrekkelijk om langere afstanden te gaan fietsen aangezien een langere afstand een betere training is. Specifieke doelgroepen kunnen bovendien op de gezondheidseffecten van fietsen als actief vervoersmiddel worden gewezen.

Fietsers in Nederland waren behoorlijk tevreden over het gemak waarmee je op de fiets onderweg kunt stoppen voor een snelle boodschap. Door dit voordeel van de fiets meer naar buiten te brengen kunnen twijfelaars wellicht overtuigd worden om toch wel voor de fiets te kiezen.

Contents

1 Introduction

All over the world, towns and cities are starting to see cycling as a good solution to environmental and spatial problems. Chester is one of many possible examples. As the Netherlands have always been a country of cyclists, there is a lot to be learned there for those trying to get more people cycling. It has long been a discussion precisely what should be learned from the Netherlands, although it has hopefully become clear by now that just copy-pasting would not do much good. This calls for research into the motivations to go cycling in the Netherlands and in the UK, and how the differences might be explained. Knowledge like this should give more insight into what measures will help en what measures will not.

1.1 Objective

The objective of this research is to find out how and what the UK and the Netherlands can learn from each other. Presumably, the UK can learn more from the Netherlands than the other way around because of existing higher levels of cycling. However, the possibility that the Dutch can learn something from cycling in the UK should not be disregarded and opportunities for the Netherlands to learn more should always be seized. The research does not necessarily give the answer to every problem concerning cycling, it does however aim to give a method for finding those answers.

As the title states, this research wants to explore peoples intrinsic motivations. These intrinsic motivations are in essence the motivations that lie beneath the surface of the first explanation people might give when asked why they cycle. Someone might answer this by saying: “because I don’t own a car” and be done with it. This research intents to dig deeper into the why or why not. Looking at the influence of social background and psychological factors.

1.2 Research Questions

The main research question that for this study is:

- Where do intrinsic motivations for cycling in Chester (UK) differ from those motivations in a comparable Dutch town, how can these differences be explained and how can they be used?

In this, a comparable city is a city that is as equal as possible in urban density and population type.

In order to make this question more manageable, it will be researched in these following sub-questions:

- What intrinsic motivations for cycling can be distinguished in research?
- Where do intrinsic motivations for cycling differ between Chester and a comparable Dutch city?
- How can these differences be explained, practically and / or theoretically?
- How does this knowledge translate into useable advice for English and Dutch cities?

The answers for these questions have been researched by preforming a literary review which gave input for field observations, questionnaires and in-depth interviews in both Chester and Leeuwarden. Analysing the data of these lines of research has led to the conclusions in this report.

1.3 City choice

Chester is a town the middle of the UK, just below Liverpool, near the Irish Sea and near the border with Wales, as shown in figure 1.1. Chester is the most important city in the county of Cheshire, which is one of England's 83 counties. The city of Chester has a reasonable amount of cyclists, and is of average size. Since Chester is in a relatively flat part of England, since it has got a sizeable student population and since it is not too big for good cycling distances within the city, Chester has a lot of potential to become a city of cyclists.

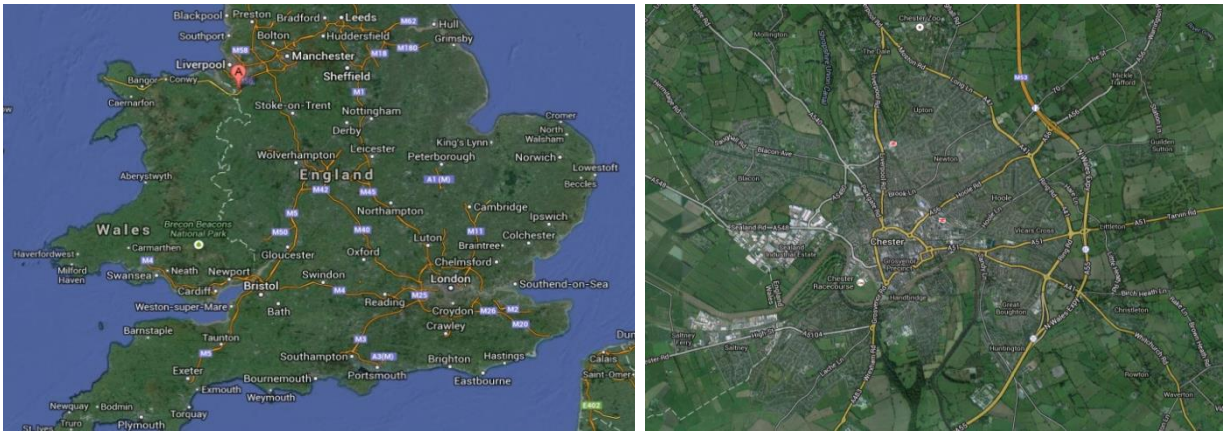


Figure 1.1: Location of Chester within the British Isles (left) and a map of the city (right)

source: maps.google.co.uk

The Dutch city used for comparison in this research is Leeuwarden, a city in the province of Frieslân, one of the twelve Dutch provinces which is located in the northern parts of the Netherlands, shown in figure 1.2.

Figure 1.2: Location of Leeuwarden within the Netherlands (left) and a map of the city (right)

source: maps.google.co.uk

Leeuwarden was chosen by looking into the following relevant factors:

Size and urban density

The city of Chester has approximately 90.000 inhabitants, mostly living within an area of 22 square kilometres (8,5 square miles). The longest trip from end to end is approximately 7 kilometres (4,4 miles) as the crow flies.

The city of Leeuwarden has approximately 95.000 inhabitants, mostly living within an area of 24 square kilometres (9,25 square miles). The longest trip from end to end is approximately 6 kilometres (3,8 miles) as the crow flies.

Population type

Both cities have a low number of black and ethnic minority groups as residents and contain a population of students.

History

Chester has a medieval (Roman) City centre, having been founded around 70 AD.
Leeuwarden has been a city since the thirteenth century, while people have lived in the area from as early as the second century AD.
Both have for a long time been compact, walled cities.

City structure

Both cities are restricted on one side by water and were once seaside towns, when the area of water used to come inland further than it does nowadays. They both have a ring road for motor traffic and have a number of major roads leading onto that ring road. Both cities are mainly surrounded by rural areas, for which they supply shopping- and cultural functions Each city has a railway station that serves both local and national train lines.

1.3 Reading guide

This report starts with a look into the available scientific literature, to see which factors may be of influence on the choice whether or not to cycle in Chapter 2. After that, Chapter 3 describes the research setup and all results from questionnaires and interviews, starting with the results from the UK, followed by the results from the Netherlands and ending with the results from comparing both countries. Chapter 4 follows with additional information that helps explain results found in Chapter 3. Following this, Chapter 5 translates the knowledge from previous chapters into applicable measures. Conclusions are drawn in Chapter 6 and recommendations for further research and for the execution of measures are made in Chapter 7, the final chapter.

2 Theoretical Background

This chapter will try to answer the questions posed in the introduction based on available (scientific) literature. It will also give input to the setup of the field research and provide a conceptual model of the behaviour. The main question discussed in this paragraph is: "What intrinsic motivations for cycling can be distinguished in research?"

Before diving into factors that influence the choice to cycle or not to cycle, it is important to have a look at some important knowledge about this, the practice of decision making. The Dutch book "The Human Decision Maker" (Tiemeijer, Thomas & Prast, 2009) offers, as the title would suggest, some insight into how and when people make decisions. Or perhaps more importantly, how and when they do not make decisions. Nobel Prize winner Daniel Kahneman states that at least 90% of our daily activity is based on unconscious behaviour; habits (Kahneman, 2012). One very important insight to keep in mind in this context is that consciously made goals do not affect behaviour very well, as long as someone's default behaviour (their habit) is still a viable option. Breaking a habit is not easily done, unless other big changes are happening in one's life, such as moving to a new house or getting a different job. If someone is determined to change however, it might help to place reminders of the new behaviour. For example, if someone wanted to stop driving the car to work and start cycling, it might help to place the car keys underneath their bicycle helmet. That way, when they habitually go for the car keys, the helmet reminds them of wanting to change that habit. Another possible aid is to form specific "Implementation intentions", e.g: "Whenever the sun shines when I wake up, I'll dress into clothes that allow me to ride my bike in to work". By breaking new behaviour down into small action oriented steps like these, it becomes much easier to actually change the old habit. In addition, planning how it would work is always a good step towards actually doing it, estate agents are very pleased when they see potential buyers start to plan how they would lay out the furniture, knowing it is a sign that these people are getting one step closer to buying the house.

Perhaps, in light of this particular study, the most important point made by Tiemeijer, Thomas & Prast is that reasons people give for their behaviour differ from their true motivations almost all of the time. This is not because they do not want to give the right reason, but because the part of the brain that made the decision has not told the explaining part why and how the choice was really made. What this study will show is what people rationally believe to be the most important influences on their choice. The study will not be able to tell how this personal theory relates to the actual reasons behind a person's behaviour. For the purpose of this study, it must be assumed that these theories come close to people's actual motivations.

Knowing this about general decision making, paragraph 2.1 can explain the factors that potentially influence a person's choice on whether or not to ride a bicycle.

2.1 Inventory of influential factors

Previous inquiries have distinguished a lot of potentially influential factors concerning the choice to cycle or not to cycle. The factors in this paragraph are mainly derived from the literary review by Heinen et al (2010). In addition, findings by Parkin, Ryley and Jones (2007) from their review of quantitative analyses, conclusions from an American anthropologist (Vivanco, 2013) and findings by Aldred (2008) have completed the list of factors currently understood to influence the choice to cycle or not to cycle used in this research. Drawing from all this research allows us to have a critical look at all that is thought to be influential on cycling choices in current scientific circles. Testing all these factors can tell us if these are influential for people in the UK and the Netherlands. Factors that are found to be of no influence here may still be of influence elsewhere, but these results should still be kept in mind when promoting cycling in these countries and in those countries that have not been looked into by this specific inquiry.

All influential factors found in literature - as previously mentioned - and set forth later in this paragraph have been grouped differently by various parties in the past, or the same groups used here may have been named differently in previous studies. Here, all factors have firstly been grouped

into two clusters: factors relating to the physical environment the behaviour takes place in, and its inherent characteristics, and factors relating to a person and his or her social environment. The first cluster was divided into three groups:

- The characteristics of the trip, relating to trip-specific physical characteristics;
- The circumstances of the trip, the non-infrastructural characteristics of the trip;
- The background of the trip, background characteristics that cannot really be changed.

The second cluster of factors, containing personal and social factors was divided into two groups:

- Factual personal and social background information;
- Personal image and influence of the social environment on a person.

A more precise differentiation between the groups used in this study will be explained below, meanwhile showing all factors that belong to each group. Here it is most important that all factors become clear, so factors may be stated more elaborately than later on in the report. Appendix 1 shows all influential factors that have been identified and explains them by giving a short example of how this factor might be influential.

Trip characteristics

Influential factors in this group describe the physical characteristics of a trip, as perceived by the person making that trip, i.e. actual trip distance is not very important, someone's view of the distance however is very important in the process of making a decision between modes.

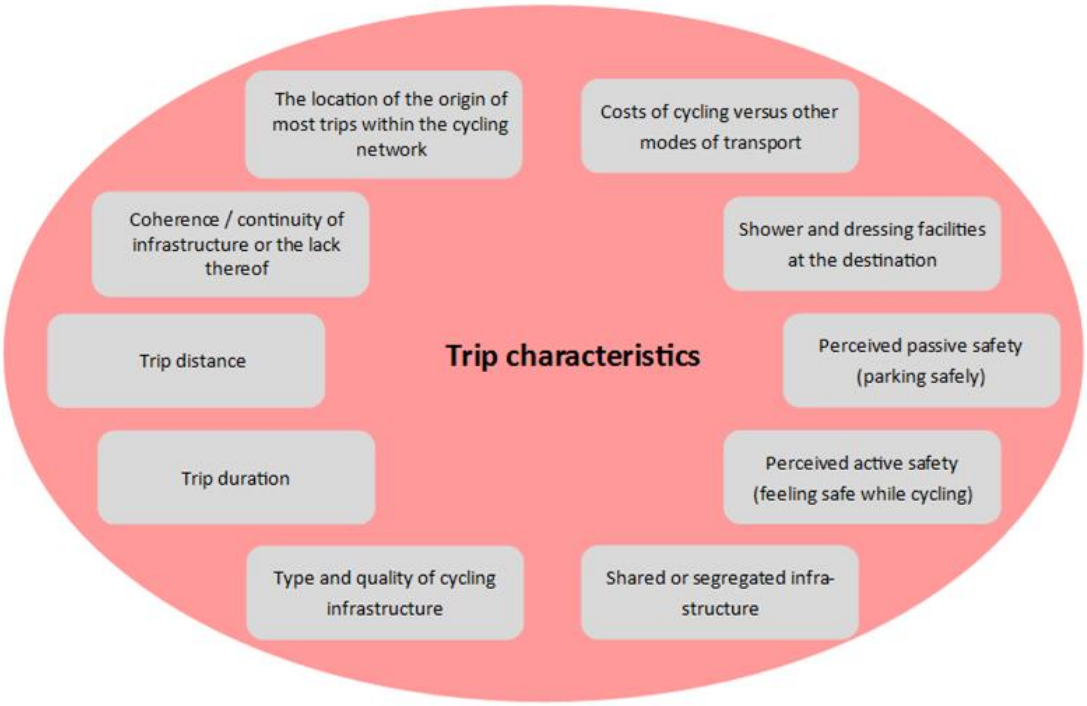


Figure 2.1.1: Factors relating to Trip characteristics

Trip circumstances

The differences between possible kinds of trips, and all the implications that these differences entail are included in this group of factors.

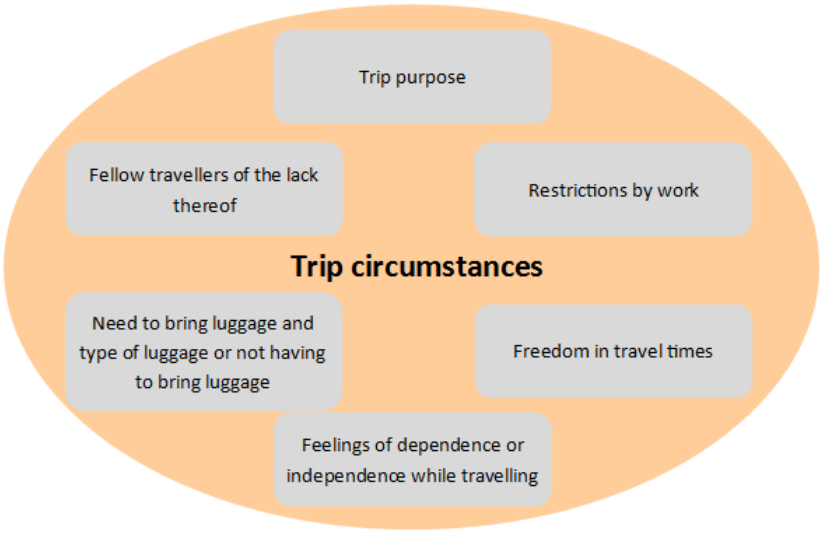


Figure 2.1.2: Factors relating to Trip circumstances

Trip background

A trip does not take place in a neutral environment, the factors in this group usually have quite a big influence on mode choice. Even on a smaller scale (route choice) these "background characteristics" play a circumstantial role in people's choices (see for example Fietsberaad, 2013).

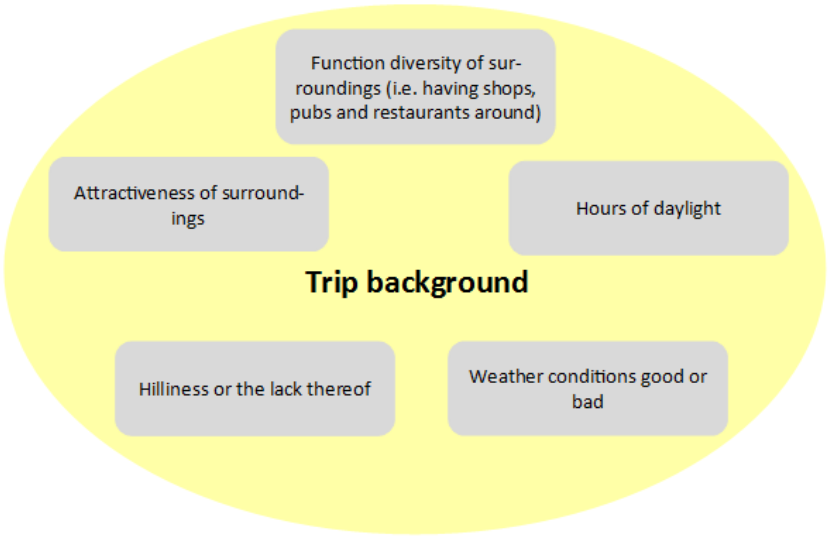


Figure 2.1.3: Factors relating to Trip background

Personal background

Amongst others Bonham and Wilson (2012) show that in western countries with a low proportion of cyclists, it is predominantly white, young to middle-aged males who cycle, whereas in countries or cities with high numbers of riders, cycling women are much more commonly seen. Apparently, these personal background factors, or rather the differences in behaviour that are distinguished by these factors do make a difference.

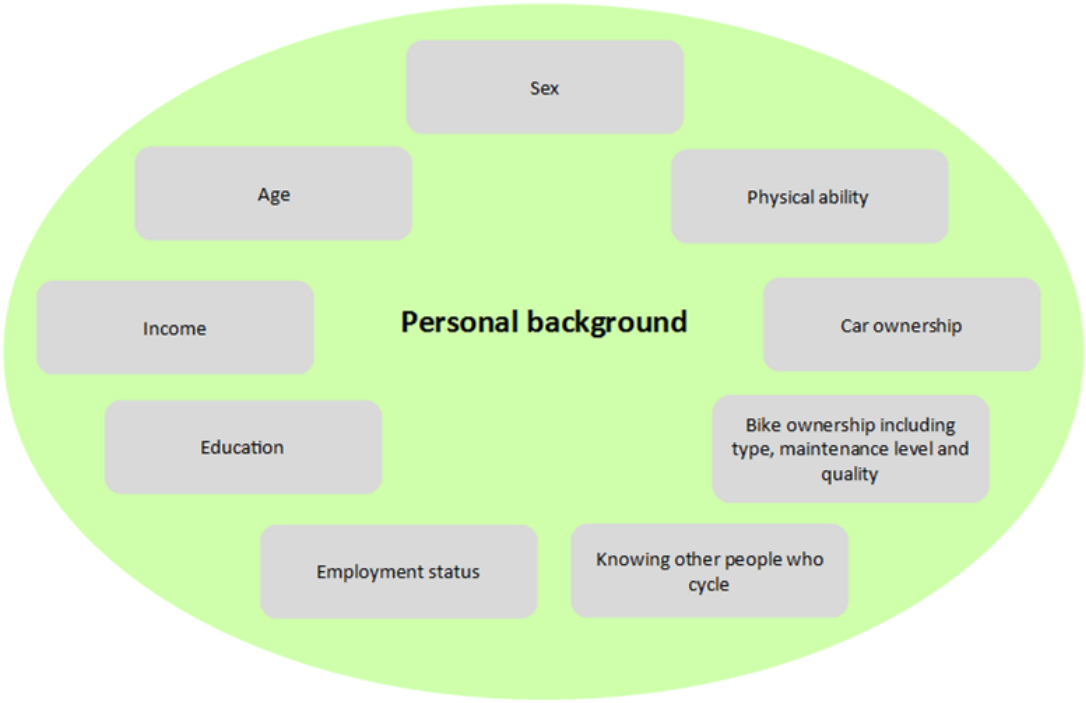


Figure 2.1.4: Factors relating to Personal background

Personal image

The factors in this group are mainly psychological; they are related to how people see themselves and how people choose to live their lives as seen from a broader perspective than the day-to-day rush of small choices.

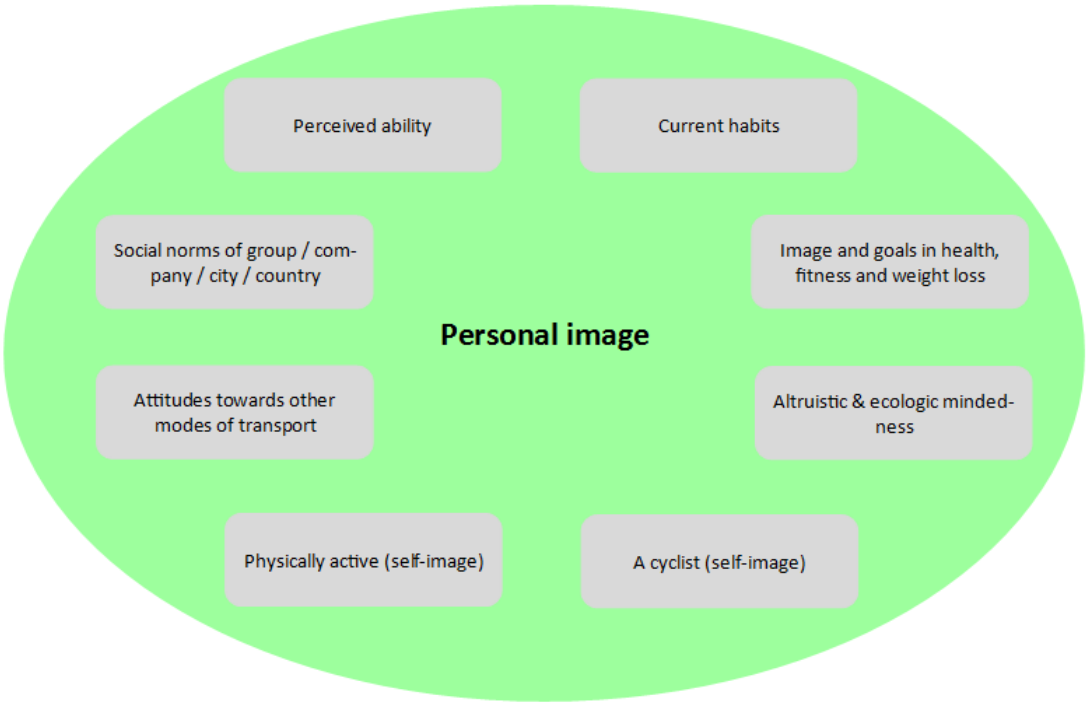


Figure 2.1.5: Factors relating to Personal image

These five groups of factors were used throughout the rest of this research, although a factor may be differently named at different points and some of the factors above may have been split into multiple factors to make them usable in the methodology. The next paragraph will talk about how this long list of factors will be analysed using a basic model.

2.2 Translation into a conceptual model

All the factors Identified in the previous paragraph will be translated into a model that tries to visualize / contextualize all these factors. The paragraph will first explain how the used model will work, then model the individual groups of factors used in paragraph 2.1, resulting finally in a summary of the full model. The paragraph ends by placing the model used here into a wider context of behavioural modelling.

To show how the factors and the groups of factors relate to each other, they will all be transformed into a model of vectors. Vectors are commonly used in Physics, where they usually represent forces, in this case forces driving people towards or away from cycling. A Vector is basically an arrow, the length of which represents how strong it is; a 10 cm arrow (vector) is twice as strong as a 5 cm one. All vectors will range according to the scheme below in figure 2.2.1. In this instance, a vector pointing to the right will be positive for cycling, a vector pointing to the left a will be discouraging. The length of an arrow will be determined by calculating the mean answer given by respondents, who have been given the scoring options displayed in figure 2.2.1.

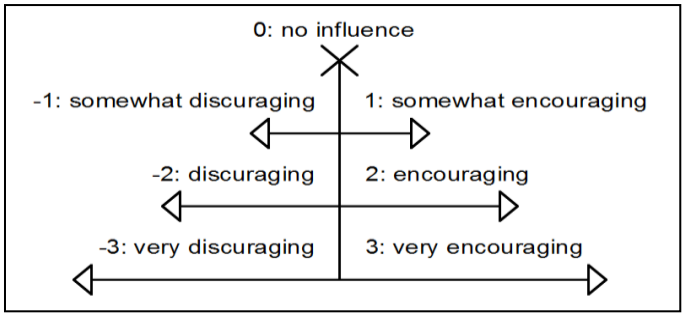


Figure 2.2.1: Vector ranges and meaning of values

Because this model requires data to show how it works, the partial model showed in this paragraph (figure 2.2.2) will show how the author feels about cycling in the UK. A full example of a filled out model can be found in appendix 2. The execution of this research should lead to a model of vectors showing how, for example, cyclists in the UK feel these factors influencing them.

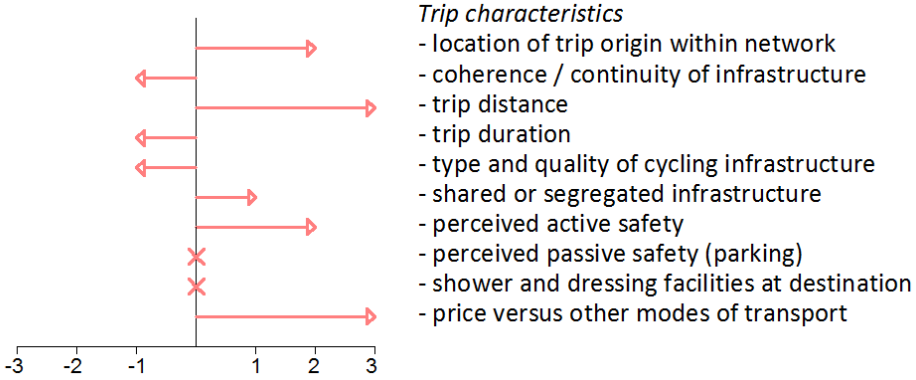


Figure 2.2.2: Model section of Trip characteristics

Although having detailed data can be very useful, such graphs make it hard to see what the overall conclusion might be. Figure 2.2.3 shows the data given above on an aggregated level: these are the average scores within each group of influential factors. Within each group, the sum of all vectors is divided by the number of factors in the group to produce the vector in figure 2.2.3. From this graph, the conclusion van be drawn that the authors overall attitude towards using a bicycle in the UK is

positive. The other conclusion that can be drawn from this figure is that to the author, trip characteristics and trip background are the least important in making decisions about utilitarian transport, since these arrows are the shortest. The factors belonging to the personal background are most influential as shown by them having the longest arrows.

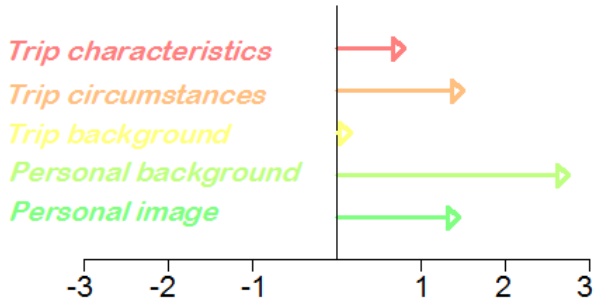


Figure 2.2.3: Aggregated level of vector model

An important question to ask is where this model fits in existing models of behaviour or decision making. Figure 2.2.4 shows where the identified groups of factors roughly fit within Ajzen's model concerning the Theory of Planned Behaviour (1991). Personal factors make up attitude, social influence and personal efficiency. Factors concerning trip characteristics, circumstances and background only come in play once the intention to cycle has been formed as positive or negative barriers. The model also shows that not all these sums of influential factors have to be positive, a high level of personal efficiency, made up to a large extent by factors from the personal background group, can be enough to start seeing the behaviour since there's a direct link between personal efficiency and behaviour present in the model. This is what can be seen when people are cycling in a system where nothing is provided for them: the innovators and early adopters as Rogers (2003) calls them.

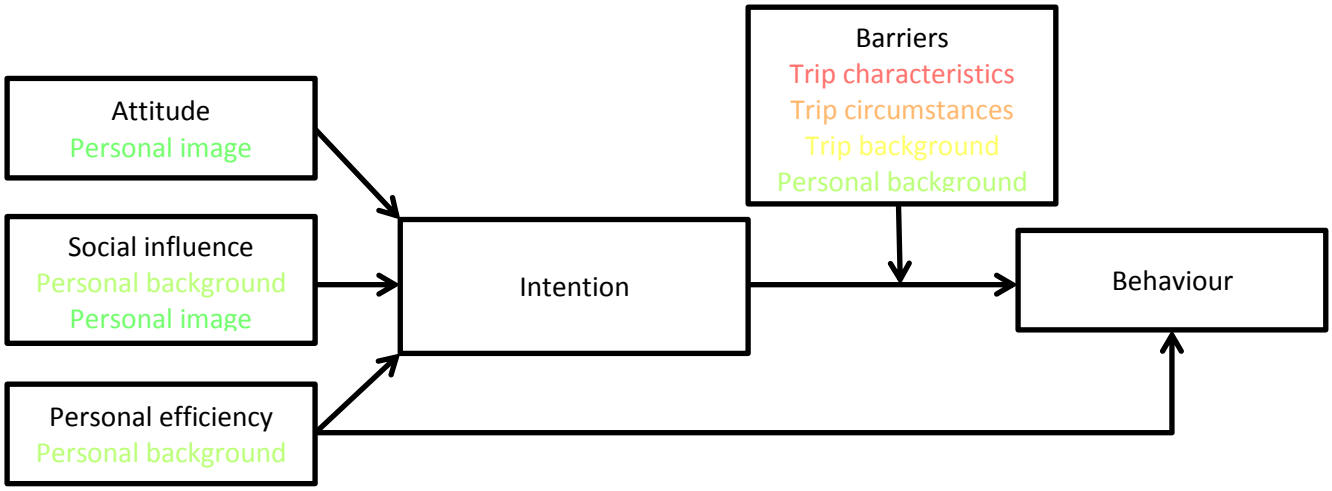


Figure 2.2.4 Factor groups within Theory of Planned Behavior (Ajzen, 1991)

A lot of the factors are barriers in this model, meaning that they only become important once the personal factors have resulted in a positive intention towards cycling. Furthermore, most barriers can only discourage, not encourage the behaviour. Since this figure only maps factors at a group level, there will be exceptions when looking at individual factors.

The following chapters will implement the model and factors that were found here into a research methodology and display the outcome of the application of said methodology.

3 Field research

In this chapter, the field research is described and the outcome of that research is reported. The first paragraph describes the setup of the research. Paragraphs 2-4 report the findings in Chester. The findings in Leeuwarden are given in paragraphs 5 through 7. The final paragraphs give conclusions based on the comparison of these results.

3.1 Research setup

A description of the setup of the research and why it was set up this way can be found in this paragraph. Although this research is into cycling, Non-cyclists may provide us with even more important information. This is why part of the research is conducted not only amongst cyclists, but also among people who travel by car, by public transportation and by foot.

A combination of questionnaires, in-depth interviews and some observations was chosen because questionnaires result in a large and reasonably well distributed numbers of respondents, also they have a low threshold for people to join and to state how they see things. In depth interviews were used to solidify the data gathered in the questionnaires, to see if the questionnaire was filled out correctly, executed one on one to ensure that each interviewee could speak his or her mind and tell stories important to them, rather than bowing to peer pressure. Some observations were used to start understanding how cycling in Chester and Leeuwarden works, to experience differences first hand.

Scope

The original idea for this research was to compare motivations for cycling, getting a representative view of two towns. This would mean labouring to get people from all target groups to partake in the questionnaires and to get them in representative proportions as well. In order to make the research more manageable in the given time, it will however focus on staff and students of the University. These people are much more easily accessible, making sure that the study is representative for at least this portion of the population of both towns. Students generally have quite a big influence on the transport system of the hometown of their university and thus they are an important group of people to get cycling. University staff meanwhile can give some insights into motivations of a part of the daily commuters of a town, another important group that would have been very hard to commit to the research in a more general study of the towns. To a lesser extent, questionnaires were filled out by Chester Cycle Campaign members in the UK and subscribers to *www.liwwadders.nl* in the Netherlands. These groups offered the opportunity to draw conclusions that are a little wider than could be drawn from just University respondents.

Questionnaires

To get some quantitative data, 150 people in the UK and 185 people in the Netherlands filled out a valid survey. These surveys were mostly held online, with the addition of a small number of paper questionnaires. The questionnaire was built by translating the factors listed in Chapter 2 into propositions and questions that respondents could rate. All factors from Chapter 2 were included in the questionnaire, either as a background question or as a statement respondents had to rate on the seven point scale shown in figure 2.2.1. Respondents started by answering a few background questions about themselves and were then asked to score the relevance of the factors. The scores they could give ranged from “very discouraging”, meaning that this factor kept them away from cycling strongly to “very encouraging”, meaning that this really attracted them in cycling. As it was not certain whether or not all factors would turn out to be relevant, the respondents were given a neutral option: “no influence”. A few of the factors could not be scored that way, these were looked into by means of the background questions. The factors that could not be scored were, sex, age, income, education, employment status and knowing someone who cycles. The questionnaire that was used for this research has been included in appendix 3.

After testing the questionnaire on five people, the questionnaire was put online and handed out on paper to a number of people. Hanging posters around campus that tried to motivate people into

participating did not turn out to be very effective, although they may have reminded people of the link they saw on the university's portal.

The main difference between the questionnaires used in The UK and the Netherlands was the language of the questionnaire, since this lowers the threshold for people to participate. One extra question was added to the Dutch questionnaire asking about the price difference between the bike and the public transport. At the moment, students in The Netherlands can use public transport for free, either during the week or on the weekend (their choice). Not separating this price difference from other price differences where the bike comes out in favour would distort the outcome of this comparison.

In-depth interviews

At the end of the questionnaires, people were asked if they were willing to participate in an interview to get an even better view of the behaviour. A number of the respondents to this question were selected and interviewed. In the interviews people were asked to talk about their experiences in cycling and what motivates them to cycle. By asking mostly open questions, people could bring forth what is most important to them, thereby checking if the list of factors found in academic literature was sufficient and correct.

Observations

Finding out what factors people deem important in their choice to cycle is only half of the necessary knowledge for this research to be of any value. For this, an analysis of why those factors are important and how they can be influenced is necessary. This analysis has been carried out by doing field observations, analysing local policies and by having conversations with a variety of people involved with cycling.

The next paragraphs will set forth and analyse all the results from generated by applying this setup.

3.2 British questionnaires

This paragraph sets out results from the questionnaires taken in Chester. All in all, 150 people responded to the English questionnaire. Most of them did so by responding to a call out about "a study on cycling" that was posted on the University's portal, a group of undergraduates filled out the questionnaire when asked to do so at the end of their class and a group of members of the Chester Cycling Campaign responded to a call for respondents placed in their newsletter. 79% of these respondents were affiliated with the University, either as a student or as an employee. The distribution of students and employees is shown in figure 3.2.1, which also shows the precise numbers of respondents and the percentage within all university respondents. This is not as negative for the overall representativeness of the research as it may look at first glance. Students and University staff are after all still just people, and they are people for whom cycling might be a really useful mode of transportation as well. One drawback however is that this results in an unrepresentatively low percentage of the lesser educated portion of the response group. Further studies should look into whether or not education is of influence. This research will assume that this does not make a difference.

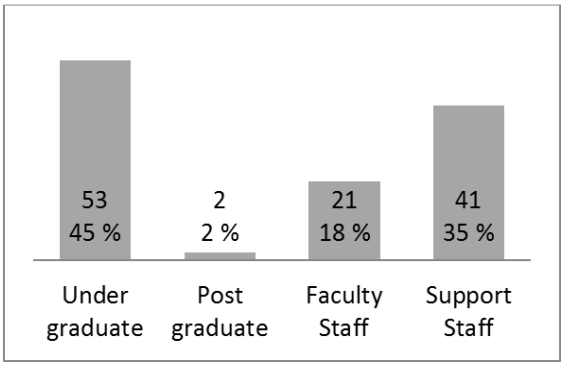


Figure 3.2.1: Distribution of university respondents (UK)

Respondent background

People between the ages of 18 and 21 make up a large proportion of the group of respondents (32 %) which corresponds with the large group of undergraduate students. Other age groups are more or less evenly distributed, the group of seniors (over 65) is somewhat under represented. The table below (figure 3.2.2) shows how often respondents of various age groups cycle. The frequency was scored by respondents themselves on the scale shown in figure 3.2.2, this scale does not represent objective measurements of frequency but rather the respondents' own judgement. If someone only leaves the house three times a week, but always does so by bike, this scale shows that this person always uses a bike on these trips, where an objective scale would misrepresent this frequency. The shading in this and all following cross tables visualises the distribution within the horizontal group. Many of the older respondents were members of the Chester Cycling Campaign, which influences the picture to some extent. Furthermore, many of the younger respondents were actively asked to take part, while older respondents took part upon seeing a message about the research on the university's portal.

		Cycling Frequency							Total
		Always	Most of the time	Regularly	Some-times	On Occasion	Never	Never even thought about it	
Age	18-21	0	4	3	5	16	17	3	48
	22-25	1	0	0	1	2	4	0	8
	26-35	3	0	2	6	1	7	3	22
	36-45	0	6	5	2	4	1	1	19
	46-55	1	5	7	4	6	0	0	23
	56-65	2	5	6	5	2	1	0	21
	> 65	1	1	4	2	0	0	0	8
Total		8	21	27	25	32	30	7	150

Figure 3.2.2: Correlation between age and cycling frequency (UK)

Almost two-thirds of respondents were female (63 %). The University of Chester has a predominantly female student population because of its heritage as a teacher training college. Even though these numbers have evened out in recent years, the university's courses mostly appealed to women. Figure 3.2.3 shows that the male respondents however were more likely to cycle frequently, while most women who do cycle, do so sometimes or on occasion.

		Cycling frequency							Total
		Always	Most of the time	Regu-larly	Some-times	On Occasion	Never	Never even thought about it	
Gender	Male	3	12	13	8	10	10	0	56
	Female	5	9	14	17	22	20	7	94
Total		8	21	27	25	32	30	7	150

Figure 3.2.3: Correlation between gender and cycling frequency (UK)

One of the potentially influential factors found in Chapter Two was the steadiness of someone's employment situation, suggesting that someone in a more steady situation is more likely to live close to their place of work / study. This theory cannot be tested here since 88% of all respondents describe themselves as being in a steady situation, meaning they have a steady contract, are a full term student, are retired or unemployed. The latter might not be as steady as the others, but being unemployed has the same implications for this research as being in a steady situation, since unemployed people are not travelling further for anything then they would if they were in steady employment.

Figure 3.2.4 shows what trips people filled out the questionnaire for. Apparently, for 54% of the respondents, the trip to work is a trip they could, can or do take by bicycle. In combination with figure 3.2.1 (which shows that most respondents are students), the conclusion can be drawn that many students filled out the questionnaire for a trip other than their trip to the University (shown as "School"). This makes sense when looking at where these students live. Since a very large part of the University's student body lives on the University grounds or just outside of them, walking to class is often the most logical option. They may however have a job or other destination further away from their dorm room that would be a good trip to make by bicycle.

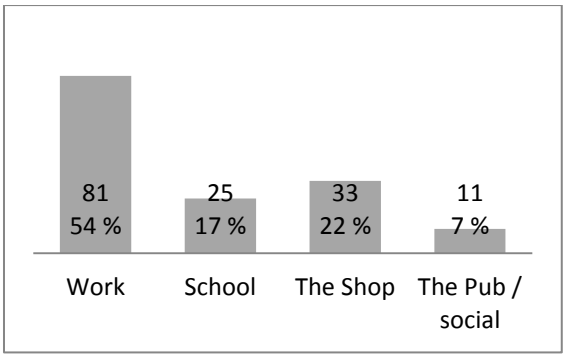


Figure 3.2.4: Distribution of trip purposes (UK)

Figure 3.2.5 shows what modes the respondents used for their trip. Above the line is their usual mode, below the line is the mode they used most recently. From this picture, cycling activists might start wondering how it is that so many people cycle in Chester. This large share of cyclists however, can be explained by a few things:

- The call out on the University's portal told people the research was about cycling;
- The University response was supplemented by 26 respondents from the Chester Cycling Campaign;
- Cycling University staff was specifically targeted and asked to fill out the questionnaire.

A high percentage of car users makes sense to anyone who has seen the sheer number of cars parked on the University's main campus. Although walking students who live on or close to campus explain this distribution in part, the general readiness to walk somewhere is also quite a lot bigger in the UK than in the Netherlands, as can be seen in the second half of this research.

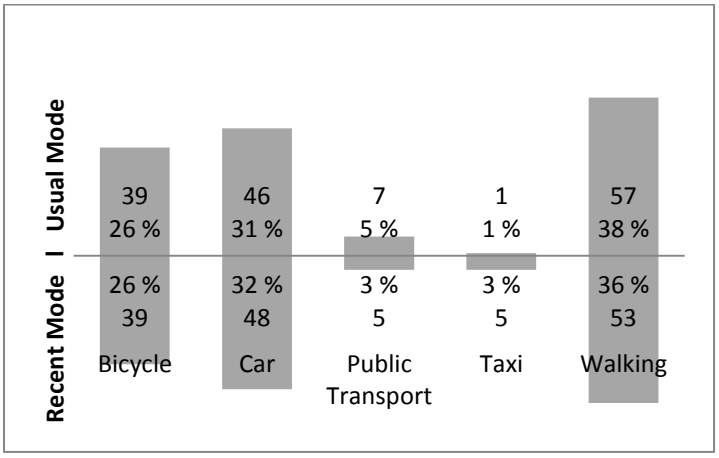


Figure 3.2.5: Distribution of mode usage (UK)

This concludes the analysis of the background data given by all respondents. Part two in the questionnaire contains all factors that each respondent could score on how encouraging or discouraging it is to them. These scores were processed and turned into the model in appendix 5. A full analysis of which will now follow.

Broad analysis

Having had a look at the background of all respondents, a broad look at the data is the first step in analysing the results from the questionnaire. This analysis shows that shorter trip lengths are generally more encouraging for cycling and trip lengths up to 15 miles are still seen as encouraging by some. Trip lengths under 2-3 miles are seen as discouraging in some cases, since these trips can be (and will usually be) walked, and students walking to and from campus is indeed a common sight in Chester. This becomes even more clear when looking at travel times, where the shortest times are only seen as discouraging for cycling, since cycling just won't help decrease the time spent on traveling. Longer travel times do offer an opportunity for cycling, until it gets to the point where the car becomes the fastest and thus most attractive alternative.

When analysing those respondents who cycled at least on occasion, thereby ruling out those who do not cycle or have never even thought about cycling, what stands out most is that overall, cyclists find more things encouraging or find them less discouraging compared to the entire group of respondents. The average mean value of answers given by cyclists is 15% higher than the same value calculated for all respondents ($\bar{x}_{cyclists} / \bar{x}_{all}$ = 1,15).

Model summary

Looking at the model and at the summary of the model, which is set up the same way it was in chapter 2, a couple of conclusions can be drawn. It is important to note that in this model, all factors have been added up without weighing them for their level of influence, which means it can only give an indication of the effect each group of factors has.

The overall most encouraging factor among the respondents was "health benefits", followed by environmental concern. The most discouraging factors were "bad weather" and having to share cycle infrastructure instead of heaving fully segregated paths. For cyclists, having bad weather is just as discouraging as having good weather is encouraging. People who do not cycle however, say they would be more influenced by bad weather than by good weather.

On average, none of the groups of factors is very influential, as shown by figure 3.2.6. None of the arrows are longer than the value one, which means no entire group of factors is more than "somewhat" influential. The group called "Trip characteristics" is the only one that averages to a negative influence. This is due to issues with the infrastructure's lack of coherence and segregation as well as its type and quality. One other very negative influence in this group is perceived safety whilst cycling. The group "Personal image" has such a positive influence overall since this group contains the two most encouraging factors: health benefits and environmental concern. On top of that, a lot of other factors in this group were mostly scored to have no influence, making a higher average easily achievable.

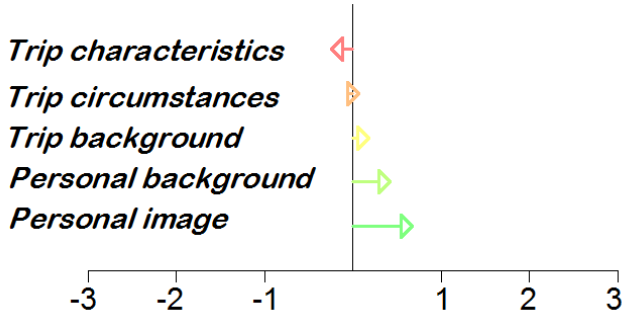


Figure 3.2.6: Summary of factor influence (UK)

Inconclusive factors

In the process of acquiring data, it became clear that for a number of factors it was unclear to people how they should score them. Although instructions had been given to always relate the factors to a specific trip that respondents were asked to take in mind at the beginning of the questionnaire, response in the comment area and feedback by a few others made clear that it still was not clear enough in what way the respondents were expected to answer. These ambiguities had not presented themselves as problems in testing the questionnaire. The factors that this research therefore cannot conclusively say anything about from this study are:

- Trip purpose;
- Need to bring luggage and type of luggage;
- Hilliness;
- Hours of daylight;
- Cycling being ordinary / strange.

In these factors it became unclear if people scored for the actual situation they were in, or for a hypothetical situation. To avoid drawing false conclusions, these factors will be disregarded or at least handled with care in the rest of this study.

All factors

The responses from the British questionnaires to all factors found in Chapter two were analyzed looking at the spread of the answers given. The summary of these results is included in appendix 4, the full set of results can be found in appendix 5. This analysis was carried out for all respondents and also by only looking at those who cycled at least some of the time, as discussed earlier in this paragraph.

When looking at the answers of all respondents, a number of factors have resulted in unexpected answers. First, shared infrastructure and active safety are major issues, even for those who do not currently cycle. These people have experienced the problems resulting from shared use when they were not cycling themselves but saw others doing so. They also may have experienced a safety issue, maybe by seeing near miss or full on accidents, maybe even by knowing their behavior as a driver can be dangerous. But for a large part probably by believing everything the media throw at them concerning cycling safety. The big media coverage of six cycling casualties over the span of nine days in London recently (see for example Huffington post, 2013) has turned an old record that keeps telling people that cycling is dangerous back on. Macmillan and Woodcock (2013) have identified media coverage as an important factor in the behavior pattern around cycling.

One of the interviewees put her concerns about the safety issue this way:

"It would be nice if I wouldn't feel such a level of stress, cycling through the city centre, cause I feel that someone or something is going to jump in front of my bike at some point."

Two factors also stand out for being scored as having "No influence": Fellow travelers and Function diversity of surroundings. The former could very well be expected to have positive influence on some, and negative influence on others. For example, not having to cycle all by yourself usually makes the trip more enjoyable, and it generally helps keeping up spirits in rough conditions. Cycling together also makes it easier to keep cycling, otherwise one excuse not to can easily lead to another and before you know it, you have not even touched your bike for a month. On the other hand though, travelling with other people can be discouraging when those other people are small children, or when they do not have a bike. Of course a lot of drawbacks that arise when carpooling also come into play, such as being dependent on the other person. So seeing that this apparently is of no influence to a lot of people, what can be concluded from that? The most logical explanation is that most cyclists generally cycle alone in Chester, which is supported by the general image of cyclists in Chester. Another explanation is that the advantages of cycling together do not weigh up against the drawbacks for a lot of people. Function diversity of surroundings was scored as having no influence, the first thing that comes to mind here is that the terminology might be unclear. However, in the questionnaire, the terminology was made clear by using examples: shops and pubs. Therefore, the conclusion can be drawn that for a lot of people, their trip does not really have to lead past these attraction points. They will probably still want to be able to reach them, but do not find it important to have them along their way on a journey elsewhere.

A further notable fact is that in all respondents, bike ownership and bike rideability are found to be encouraging. This means that even those who do not cycle already own a bike useable as a mode of transport, or at least they do not see any problems in obtaining one. This leads to the conclusion that bicycle hire or loaning programmes would not help much to get people who do not currently ride a bike to start cycling. Since people who do not cycle also do not see any problems in obtaining a bike even though there is no public bike hire scheme in Chester, the threshold of needing a bike to be able to cycle is not lowered by bicycle hire schemes. These programmes look to be mainly benefitting people who are used to cycling elsewhere but do not have a bike with them at that time and place. Further research should be done to confirm these findings.

Differences

The analysis shows a number of differences between the entire group of respondents and the cycling respondents. These differences are very interesting to look into, since they show the difference between what people think they would deem important as cyclists and what cyclists really experience as being important.

Probably the most telling difference is regarding the type and quality of cycling infrastructure. Cyclists are negative about this, having experienced flaws in the infrastructure and in the system first hand. Meanwhile, non-cyclists are positive (their positive responses lead to the scale being widely used), these people have probably seen some cycle paths and believe therefore that these paths make a good piece of infrastructure for cyclists. The same thing occurs with the factors concerning parking and shower and dressing facilities. People who do not cycle see some facilities and think it would be good to use those, while people who do cycle desire to have them at more places, everywhere they go, or would desire to see them executed better.

Then there are a number of cases in which cyclists are more positive than non-cyclists. Cyclists know the price difference between cycling and other modes of transport to be more influential than those that do not cycle expect it to be. The same thing goes for independence while cycling and the skills required for cycling (perceived ability). Mainly the first two offer opportunities to further promote cycling, as these benefits can still become clearer to people who do not cycle. Applications could be a price comparison calculator that includes other costs than just petrol prices to show price differences and visual expressions of freedom in promotional material. The ability question is not as usable for promotions, it does however make perfect sense that cyclists know very well that they have what it takes to ride a bicycle, while non-cyclists can only suspect they will be able to do it.

Three of the differences shown in the table in appendix 4 give some insight into the people who currently cycle in the UK. These people generally do not (really) like cars or public transport, and most of them do not mind being seen as a cyclist, or even like being seen as such. All of these three factors were scored by non-cyclists to be of no real influence.

Cyclists say owning a car does or would discourage them cycling, while their overall attitude towards the car as a mode of transport is that they would rather not use it. People scored “Not using my car” as encouraging, but they also say that owning a car discourages them from cycling. The conclusion that can be drawn here is that these people would rather not use their car as often, but see themselves falling back upon it as well if they do have the possibility of using a car.

An interviewee:

“I sold my car last year … So if I’ve got to go anywhere in Chester and it isn’t walkable, I cycle.”

The figure below (3.2.7) shows how “knowing other people who cycle” relates to how often a person cycles. Other people could be family, friends, acquaintances or colleagues. A more detailed analysis shows that the connection between cycling frequency and knowing others who cycle is not weaker with less tight interpersonal bonds. A logical expectation would be to see a smaller correlation when colleagues who cycle are compared to family or friends, but this is not the case. The presumption here is that knowing someone who cycles, or knowing multiple people who cycle, can help someone start to use a bike as a mode of transport. This is because a lot of people in the UK have never even considered cycling, and knowing someone who uses a bike that way could help those people to start seeing cycling as an option, only then can the question arise whether or not it is a viable option. This theory seems to be supported by the results in figure 3.2.7. However, an argument can be raised to consider these results the other way around. Someone who cycles probably gets to know more people who do so as well. This would be the same thing you experience when you buy a different car. Suddenly, you notice a lot of those cars driving around, nothing changed in the situation, you just became more aware of what was always there, this phenomenon is called selective attention

(Duncan, 1984). In this case, when someone starts cycling, they might suddenly notice a lot more cyclists. More research is necessary to define which is really cause and which is effect. The argument that cycling has to be recognised as an option before it can even be considered does however stay important, and it may be one of the main explanations for evident differences between the UK and the Netherlands. This will be discussed in later paragraphs.

		Cycling frequency							Total
		Always	Most of the time	Regu-larly	Some-times	On Occasion	Never	Never even thought about it	
Others who cycle	None / not applicable	0	2	2	1	3	10	2	20
	1 person	2	1	7	3	11	8	2	34
	A few people	4	13	15	17	16	12	3	80
	A lot	2	5	3	4	2	0	0	16
Total		8	21	27	25	32	30	7	150

Figure 3.2.7: Correlation between knowing others who cycle and cycling frequency (UK)

3.3 British interviews

The interviews described in this paragraph were held using questions that were as open as possible. Thus giving the interviewees the chance to speak about their most pressing issues in cycling. Along with five cyclists, one non-cyclist was interviewed to see if the same issues are salient for people who have not yet experienced what it is actually like to cycle in Chester. Five of the interviewees were affiliated with the university, most of them as teachers or other staff, one person was not. The interviewees were two men of middle age, one young mother, two other young women and one middle aged woman.

The most commonly raised subject in the interviews was safety, specifically cycling in traffic. Most interviewees told stories about drivers willingly cutting them off or pushing them off the road. One of the interviewees was a young mother who regularly cycled with a child in a special seat on the back of her bike. When she had the child seat on the bike, she would notice car drivers taking much more care when driving past or alongside her. This would even be the case if the child seat was empty, since the drivers still saw a vulnerable young mother on a bike. Whenever she would take off the seat, she would experience a lot more hostility while making the same trips.

Similarly, one enthusiastic young cyclist experienced a change in behaviour along with the kind of attire she wore. Whenever she would wear lycra cycling gear for rides on the weekend, she would experience a lot of hostility. In this clothing, she had become "a cyclist", being some weird creature that takes up space on our roads. She was no longer seen as just another fellow road user, or even just another human being trying to get from a to b. This theory is supported by how motorists would interact with her whenever she was cycling to work in complete feminine attire. In those clothes, she would become a person again, and drivers would treat her less rudely, although an even bigger change would still be desirable. This effect was also established by Ian Walker, by looking at the distance car drivers left between them and a bicycle when overtaking (Walker, 2006). His theory being that drivers judge the predictability of cyclists' behaviour by appearance and overtake accordingly, leaving less space for lycra- or helmet wearing "experienced" cyclists, and more space for women.

An interviewee:
"…we're all human beings here, and there seems to be just a horrible relationship between cars and bikes here in Chester."

When asked about the deliberateness of the actions these drivers took, most interviewees were convinced the behaviour was completely conscious. One interviewee did agree that the situation in London did get a little better after the tube bombings in 2005, when a large amount of people made a transition from public transport to the bicycle and bikers were suddenly seen a lot more in the city (Fasolo et al., 2007). Drivers started expecting cyclists and that seemed to make the situation somewhat safer.

The two women mentioned above were the only interviewees who actually cycled on main roads. One person only used back roads and would use only bike paths if and when they were available. The others, who moved specifically to a place where cycling was an option, only used cycle paths that were separate from road. Both of them would probably never cycle among other traffic, using a sidewalk or taking a detour when no specific cycling infrastructure was provided.

All interviewees either had a history of cycling or had recently gotten into cycling because they saw other people around them do it. An important aspect that was not properly reflected in the questionnaire but did come forth in the interviews was dissatisfaction with using a car. Multiple interviewees mentioned that they had previously made their trips by car but had decided it was time for a change since increased busyness on the road had decreased their enjoyment in driving, increased stressfulness and increased the time spent driving to and from the university. As one interviewee put it: *" … just driving 2.5 miles, you can feel your blood boil on occasions*."

Full transcripts of these interviews are available upon request at lentingcycling@gmail.com.

3.4 British findings

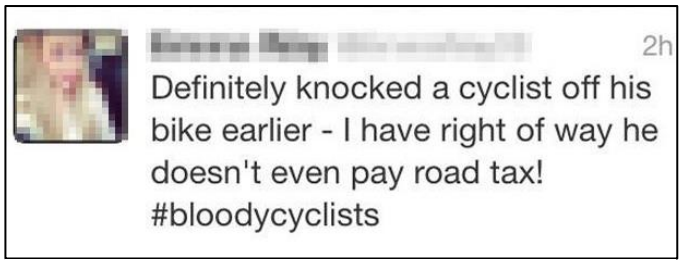
Out of the previous two paragraphs, this paragraph selects the most important findings and takes an extra look at them. Three important findings will be listed and then explained further in the corresponding paragraphs below.

In short, these are the three most important findings from the analysis of the British results:

- Cycling has to be salient (it has to be in someone's mind) before any other factors come into play;
- There are some important differences between how people who don't cycle view cycling and how people who do cycle find it;
- Deliberate dangerous behaviour versus unfamiliarity in car drivers.

For cycling to become someone's transportation mode of choice, it has to become salient as an option to them first. If someone has never seen cycling as a potential mode of transport, it will never become one for them, unless they first start seeing cycling as something other than a toy or a sport. Similarly, cycling has to become salient for those who develop anything to do with public space. Only once they start asking the question "What are we doing about cycling?" can anything real be done, even if in the first instance, the answer to this question is "nothing". Wales is for instance taking a big step towards a better future for cycling by requiring all local authorities to have a 15-year vision on cycling (Sustrans, 2013). Even when all their "Active Travel Act" does is start people thinking about cycling, it will be a big step forward. The national government of the UK lacks such a strategy, even though the EU recommends countries to have one.

Important for cycling promotion is to keep in mind the differences between how non-cyclists see cycling and how cyclists experience it. Cyclists are less positive about infrastructure then non-cyclists, so it is probably not a good idea to use infrastructure as a selling point to convince people to start cycling, once people start experiencing it or looking into it, they will find that it is not as great as they thought after all. Cyclists are more positive about the price difference, the independence and having the skillset required for cycling, so these aspects could and should be conveyed better to people who are considering to start cycling.



Source: http://goo.gl/khZNZO

The stories told by the interviewees are convincing enough to believe that drivers willingly endanger cyclists and are more careful when there is also a child on the bike or when the cyclist in question is an attractive young woman. This deliberate behaviour, paired with an unfamiliarity with cyclists and how to deal with them together makes cycling on the main road prohibitively intimidating. Before every cyclist starts riding with a child seat on the back of the bike, other solutions should be considered. Building a lot of cycling infrastructure is desirable and would solve a lot of problems, but only a small portion of trips can ever be made by using cycling specific infrastructure only. Driver education and influencing is necessary to see big changes. Ideally, every car driver should experience what it is like to be that cyclist. Otherwise, campaigns could show how little difference behaving better around cyclists makes when looking at their entire journey.

The process used to describe the British results, will be applied to the Dutch results in the next couple of paragraphs before this chapter ends with the comparison of the results from both countries.

3.5 Dutch questionnaires

This paragraph describes the results of the research executed in Leeuwarden, the Dutch town used for comparison. The Dutch questionnaire resulted in 185 valid responses, of which 82% was from people who were affiliated with the university in some way. Most of these people responded to a call on the portal of the University of applied sciences, a number responded when personally or through social media asked to take part. The last group of people responded to a call for participation on the website *www.liwwadders.nl.* The full questionnaire used is included in appendix 3.

Respondent background

Almost all trips that this questionnaire was filled out for were usually made by bicycle as well as last time. One person usually travelled by car and two people usually travelled by public transport. Cycling is much more common in the Netherlands, so asking someone to fill a questionnaire out about a trip someone *could* cycle, will logically result in response about a trip that people *do* cycle, since most people have at least some trips they usually make by bicycle.

Since a large proportion of the respondents to this questionnaire were students (139 out of 185 Dutch respondents), most respondents were between 18 and 25 years of age. Figure 3.5.1 shows the correlation between age and cycling frequency. As was already established in the paragraph above, most respondents did cycle, the figure shows that this is evenly distributed across age groups. Different from the English respondents, no groups were specifically asked to fill out a questionnaire, every person responded to a call to participate that was posted on one of a number of websites.

		Cycling frequency							
		Always	Most of the time	Regularly	Sometimes	On Occasion	Never	Never thought about it	Total
Age	18-21	22	18	3	5	5	3	0	56
	22-25	19	17	6	3	5	2	4	56
	26-35	9	10	2	2	3	1	4	31
	36-45	2	2	2	1	0	0	0	7
	46-55	7	3	3	1	0	0	1	15
	56-65	5	6	0	0	0	0	0	11
	> 65	4	3	1	0	1	0	0	9
Total		68	59	17	12	14	6	9	185

Figure 3.5.1: Correlation between age and cycling frequency (NL)

Both genders were present in the response group in equal proportions. There was no difference between genders when looking at cycling frequency just like there was no difference between age groups in figure 3.5.1.

Similar to the British response group, a large portion of the Dutch respondents were in a steady situation. 86 % of these respondents either had a steady contract, were unemployed or were retired.

The trips that the questionnaire was filled out for are shown in figure 3.5.2. Since a lot of the respondents were students, it makes sense that the most questionnaires were filled out for a trip to “School”, being the University of applied sciences in most cases.

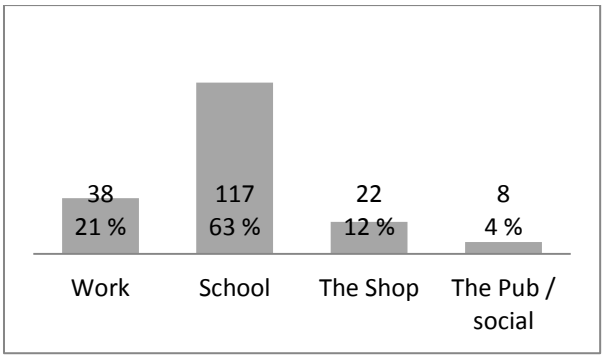


Figure 3.5.2: Distribution of trip purposes (NL)

Broad analysis

As mentioned above, this study cannot draw conclusions about the importance of gender and age in relation to cycling frequency since so little spread in frequency has been found in the Netherlands. Figure 3.5.3 shows that 69 % of the respondents said they cycle always or most of the time. This also results in an inability to say anything about the relationship between cycling frequency and knowing other people who cycle and the relationship between cycling frequency and employment status.

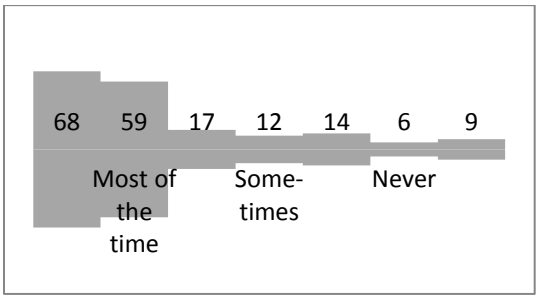


Figure 3.5.3: Spread of cycling frequency (NL)

The distance of a bike ride is mostly seen as encouraging for distances up to 5 miles (8 km) or duration up to 20 minutes. Dutch respondents were asked to give their trip length in kilometres, as is the standard for distances in the Netherlands, these values were calculated into miles to be comparable with the distances entered by the British respondents. The values found here are coincidentally very near to the 7,5 km threshold commonly used as acceptable for cycling since a 1997 report by the Dutch Ministry of Traffic (Touwen, 1997). They asserted that 7,5 km is rideable on a bicycle within an acceptable 30 minutes.

Any kind of cycling specific infrastructure was found to be encouraging, if it made a difference to people at all, as shown in figure 3.5.4. The people who only used main roads did not see this as being of real influence, neither in a negative nor in a positive way. This shows that there is a big difference between the attitude of cyclists towards motorists and probably the other way around as well when comparing the Netherlands to England. This is probably to a large extent due to the safety in numbers effect as described by Fyhri and Bjørnskau based on surveys and interviews in Norway (Fyhri and Bjørnskau, 2013). Drivers in the Netherlands are used to having cyclists on the road, know they can expect a bicycle on the road and generally know how to behave around them. Cyclists feel safe on the road because it is completely normal to them that they can ride a bike there, most will never have considered it dangerous to ride in among traffic. And of course, in the places where it would be dangerous, the government will generally already have provided separate infrastructure. When asked specifically about feeling safe when cycling, there was no difference between what kind of facilities were used, all groups scored safety as not influential in their current situation. This further solidifies the finding that these people feel safe when cycling.

		Type and quality of cycling infrastructure							Total
		Discouraging			No influence		Encouraging		
Infrastr. used	Cycle paths only	0	0	1	5	1	4	4	15
	Cycle paths and cycle lanes	1	2	4	14	10	9	6	46
	Cycle lanes only	0	0	0	0	0	1	0	1
	Cycling infrastructure and main road	1	6	10	36	24	25	11	113
	Main road only	2	0	0	6	1	0	1	10
Total		4	8	15	61	36	39	22	185

Figure 3.5.4: Correlation between infrastructure and scoring of influence of infrastructure (NL)

Model summary

As in the analysis of the British questionnaires, all Dutch scores have been summarized into the model in figure 3.5.5 (the British model is figure 3.2.6). The most striking thing in this model is the lack of variation between groups. The fact that overall all groups give a positive result makes sense, since most of the respondents did cycle. Even though there are large differences when looking at individual factors, the product of all factors has become quite similar for each group, they are all between 0,48 and 0,76 on a scale from -3 to 3. So the circumstances, characteristics and background of a trip, as well as the personal background and image are all slightly positive overall. People use a bicycle, they are not necessarily all a fan of doing so (since that would result in longer arrows) but they are positive enough about it to choose it over other modes of transport.

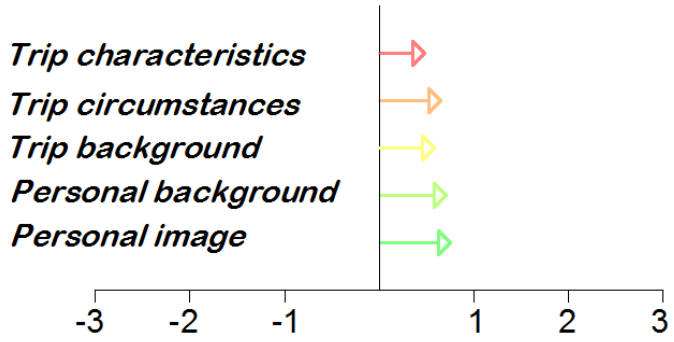


Figure 3.5.5: Summary of factor influence (NL)

All factors

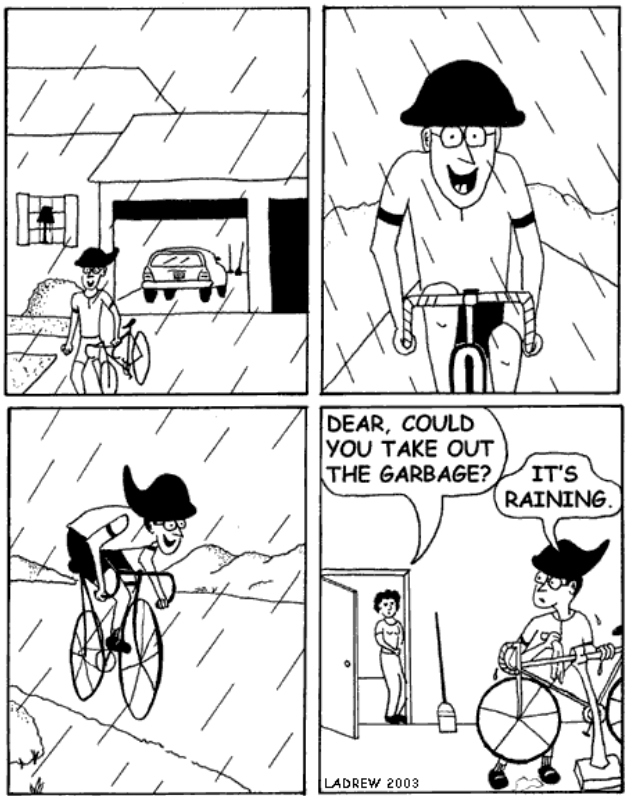
Similar to the British results, an analysis of all Dutch responses was carried out in order to draw conclusions from the spread of the answers given to each question. The summary of all responses used for this analysis is included in appendix 4. A complete overview of all factors and the scoring for them is included in appendix 5.

A number of things stand out when looking at the bicycle network and the route people use. First of all, the spread and layout of the bike network is seen as good because most people scored that the location of the origin of their trip within the network was positive. The type and quality of the infrastructure provided for them must also be good, since it was scored to be of no big influence. This seems odd, but it makes sense when you realise that good bike infrastructure is taken for granted in the Netherlands. So as long as this is not scored negatively, the quality of the infrastructure must be good. Only those people who regularly cycle in different places could possibly distinguish the difference between the infrastructure somewhere being reasonable, good or very good since contrast with the infrastructure in other places is the best indicator of the quality of infrastructure in

their home town. Another indicator of network quality is the scoring on function diversity of one's route. Function diversity can be positive in two ways: you cycle through an area with a lot of functions and are thus able to use those functions, or you choose to cycle through a quiet area and are thus positive about being able to relax there. Having this choice is a sign that there is a really good bike network, since there are multiple routes of comparable length that lead to your destination. Similar to this, no influence can mean that one's normal route does not lead through an area with a lot of functions, but that one could still easily reach those functions when they want to. It could also mean that you do cycle through an area with a diversity of functions but this does not bother nor aid you. Again, in both of these cases, freedom in route choice, whatever someone's preference is, shows that there is a good network laid out for a cyclist to use.

Having or lacking fellow travellers has no influence to people in this situation. Everyone generally has a bike so going somewhere together can easily be done by bike and cycling alone in the city is not influential, it does become more of an encouragement or discouragement on longer trips, since cycling together makes a trip feel shorter and a person can more easily find motivation to continue, since you cannot let your fellow cyclist down. Cycling together requires differently sized infrastructure, which has been taken into account in CROW's bicycle design manual (CROW, 2007)

Unsurprisingly, bad weather is discouraging for most people, it all depends however on what someone's definition of bad weather is. If bad weather only includes heavy storms, glazed frost and heavy snow, then bad weather is discouraging, but it will not influence the choice whether or not to cycle very often. When however the slightest rain is seen as bad weather, this will have a lot of influence. The relationship between weather and cycling has been established by the Dutch Bicycle Council as well (Fietsberaad, 2007).



Source: http://www.bikexchange.com/cartoon32.htm

The influence of car ownership has been scored quite divergently. Presumably, it has been scored positively by those without a car since that makes the decision to cycle easier, and it has been scored negatively by those who do own a car. The people who chose "no influence" would be those who can cycle to a destination faster than they can drive. These people may own a car, but this will not have much effect on their choice whether or not to cycle.

Attitudes toward different modes and support from family or university, the social norms, are said to be of no (big) influence. This is probably similar to the quality of infrastructure being of no influence. This research was unable to test if these factors really matter, the only way to know if support truly matters is by taking support away or adding support and seeing what happens. Attitudes towards other modes of transport and their influence could be tested in a questionnaire, but only by first asking questions that allow the respondent to become aware of their true attitude towards these modes, and then having them score how this influences their cycling behaviour. These factors probably matter much more than people realise, but the question of how much it matters calls for further research.

3.6 Dutch Interviews

The interviews conducted in the Netherlands were held according to the same protocol as the British interviews. Questions were as open as possible, and interviewees were given the chance to talk about what was most important to them. A noticeable fact was that the Dutch interviews were all shorter than the British interviews. This is probably due to the fact that for Dutch people, cycling isn't that special, so they do not feel that there is that much to talk about. Whereas British cyclists are generally more enthusiastic about their cycling since they chose to stand out of the crowd by cycling. In Leeuwarden, six people were interviewed, of whom five cycled more or less regularly in Leeuwarden and one does not cycle there at all, he was in the habit of using public transport. Two of the interviewees did not have a current connection with the university of applied sciences, the rest were involved there either as a student or as a teacher. The interviewees were two male students, a young male teacher, one young professional male, an middle aged female who was part time student, part time teacher somewhere else and a middle aged working woman.

The most outstanding thing in Dutch interviews is the rationality of why people use a bicycle as a mode of transport. Most of the reasons people give for riding a bike rather than walking, driving or using public transport are rational arguments: price, directness and speediness. The interviewees who cycled a lot went on to mention that they also enjoyed cycling, which helped their choice. This rationality shows how ordinary cycling is in the Netherlands, fondness for cycling may determine why someone cycles more often than the next person, but in the first instant, there doesn't seem to be much difference between cycling and walking somewhere.

Since safety in the interaction between cars and bicycles had proven to be a big issue in England, interviewees in the Netherlands were also asked if this was significant to them. These people did not see any problems in their current situation in their interaction with cars, since they would be separated from cars most of the time anyway on Leeuwarden's system of bike paths. One of the interviewees talked about a couple of occasions where he had a near-miss collision with a car, explaining that these situations made him aware of his position as a fragile road user, never so much so however that it would lead him to alter his behaviour. When talking about safety, the interviewees did mention problems with passive safety, that is, cycling through (un)safe surroundings, or risk of bike theft. For three of the respondents, bike theft was a big issue. They all took extra measures to prevent their bike from being stolen, and two of them even chose not to cycle in certain situations to avoid the risk of having their bike stolen. Interestingly, in the questionnaire, parking safety was generally scored as positive. This indicates that parking safety is only an issue for some specific destinations, being no problem for most destinations that the questionnaire was filled out for.

One of the interviewees mentioned that to her, cycling was not only a mode of transport, but also an opportunity to have a brief moment of relaxation on a busy day. While English cyclists are often faced with stressful situations, segregation and proper integration of cyclists in the Netherlands seems to mean that cycling can be the opposite, providing stress-relief.

Full transcripts of these interviews are available upon request at lentingcycling@gmail.com.

3.7 Dutch Findings

This paragraph shows the most important findings out of paragraphs 3.5 and 3.6, being the most important findings out of the Dutch part of this research. The two most important findings are listed first, being explained afterwards in the corresponding paragraphs below the shortlist.

The most important Dutch findings are, in short:

- A bike is a lifestyle for most in Britain, it is a tool for most in the Netherlands;
- There are a number of factors that can discourage someone from cycling, but can never really encourage.

Because at this moment, most people who cycle in the UK are enthusiasts, cycling to those people who you find cycling is very much a lifestyle or an expression of general sportiness. In the Netherlands, the bike is an ordinary tool to most people. Ideally, the bike will become a normal tool for people in Britain as well. The problem is however, that enthusiasts are labouring to convince people for whom a bike could very well serve as a tool. People who would not want sporty bikes with special features, but a straight forward bike. People furthermore who would not want to have to dress up specially or buy all kinds of specialist gear that the fanatic cyclists enjoy using. To get past just having enthusiasts, we need regular people promoting regular bikes.

As already discussed in Chapter two, a lot of factors are barriers that currently prevent people with a positive attitude towards cycling from actually doing so in Britain. Some of these barriers are now discouraging people from cycling, but if the situation regarding these factors were to improve, they would not become encouraging, they would then be taken for granted. This research has shown this to be the case for these factors:

- Type and quality of infrastructure;
- Attitudes towards cars, public transport & walking;
- Having the skills and fitness required;
- Support from family or university.

This concludes the analysis of the data from the individual countries, the next paragraphs describe the results of comparing the data sets.

3.8 Comparison

The last and most important paragraphs of this chapter will put the questionnaire results together and draw conclusions from the comparison. Coming back to one of the main questions of this research: “Where do intrinsic motivations for cycling differ between Chester and Leeuwarden?” This paragraph will start by listing some background information to the comparison.

As previously mentioned, this research generated 150 responses in the UK and 185 in the Netherlands, therefore the population for this comparison is 335 respondents. In order to make this comparison statistically sound, t-tests have been performed. These t-tests show which factors are statistically significantly different between the Dutch and the British results with a 95% certainty.

In the background data there are a number of factors that do not significantly differ from each other and a number that do. Table 3.8.1 shows these two groups of background data. In conclusions drawn, mainly the fact that there is a significant difference in age between the two groups could play a part. The other differences all make sense since paragraph 3.8.4 has shown that the Dutch response group mainly contains people who cycle regularly. It is interesting to see that there is no significant difference between trip duration, but there is a significant difference between trip length. This is due to the fact that a number of Cestrian respondents filled out that question for their trip by car or public transport. When analysing cyclists only, there is no significant difference in duration or length, so it is not because Dutch cyclists cycle faster.

Table 3.8.1: Significance of differences between background data

No significant difference	***Significant difference***
Gender	Age
Trip purpose	Usual mode of transport
Trip duration	Recent mode of transport
University affiliation	Trip length (miles)
Employment status	Used infrastructure
	Number of cycling acquaintances
	Cycling frequency

Significant differences

Table 3.8.2 shows if the answers were mostly on the encouraging side (positive), mostly neutral (no influence) or if they were mostly discouraging (negative), “wide” indicates that there is no clear pattern in the answers given by the respondent. Some variations on this broad characterisation were used where necessary. A complete overview of all factors and the scoring for them is included in appendix 5. The factors that were found to be unclear in the questionnaire are included in grey text. Table 3.8.2 contains all factors that had statistically significantly different means, A table containing both the factors with significantly and those with insignificantly different means has been included in appendix 4.

Table 3.8.2: Significant differences between UK and NL

Trip characteristics	***UK***	***NL***
Location of trip origin within network	wide	positive
Coherence / continuity of infrastructure	negative	wide
Type and quality of cycling infrastructure	wide	no big influence
Shared or segregated infrastructure	negative	no influence
Perceived active safety	negative	wide / no influence
Perceived passive safety (parking)	wide / positive	positive
Shower and dressing facilities at destination	no big influence	no influence
Personal image		
Habits	no big influence	positive

Most of the factors in table 3.8.2 show the difference between Leeuwarden's and Chester's networks of cycle paths. The first four factors in the table all show that Leeuwarden has a better bike network, keeping in mind that having a good network is often taken for granted in the Netherlands, which is why type and quality of infrastructure as well as segregation are regarded as having no influence. These facilities do not influence people positively, they will and/or would however influence people negatively if they are not present or if they are of insufficient quality.

Figure 3.8.1 shows two charts that show just how many responses were recorded for each possibility. In these charts, the segment that contains the mean value is accentuated and the values of each bar are given as well as shown. The seven segments shown in the charts represent the answer possibilities from very discouraging trough no influence to very encouraging. The charts show the distribution of answers within each response group and the differences in distribution between the two countries. The chart on the left shows the responses from the UK and the chart on the right shows the scorings on relevance from the Netherlands to the factor: "Feeling safe / unsafe when cycling".

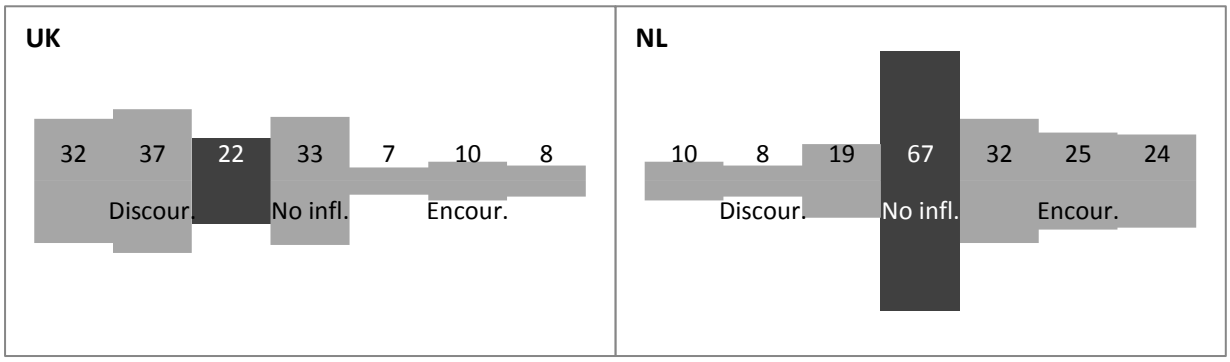


Figure 3.8.1: Perceived active safety in the UK and NL

There is quite a difference in how safe people feel when cycling and how that influences them, as shown in figure 3.8.1. In the UK, most people find the lack of safety discouraging, with still quite a big group finding safety of no influence. The Dutch respondents mostly find safety to be of no influence or even encouraging. There are three explanations for the difference in safety that have all come forth in the interviews. The most commonly heard explanation is the difference in infrastructure. Logically, cycling on a cycle track that is separate from the road will reduce safety issues between motorists and cyclists. A point John Forester (2001) makes however, is that even when there is a good network of bicycle specific infrastructure, This will never lead the cyclist all the way from their front door to their destination, they will always have to cycle on the road with traffic at some point. The second explanation for the difference in safety then, is the attitude of motorists towards cyclists. Many of the interviewees mentioned cars deliberately swerving towards them to push them of the roads. This may very well be deliberate aggression in some cases, but inexperience in dealing with cyclists on the road also likely plays a part in this. Both of these are tough to solve, The most likely long-term solution would be to get attention for dealing with cyclists in driver education programmes. However, since the UK does not require aspiring drivers to enrol in a driving school (anyone over 21 with three years driving experience can teach someone to drive) this solution would have very little effect (AngloInfo, 2000). Public campaigns for cycle safety may have some effect, but only when executed using psychological insight. The best solution would be to have every driver experience the situation from a cyclist's point of view, that however, would be hard to achieve. The third explanation to the difference in cycling safety between the Netherlands and the UK is in expectation of motorists. Since drivers do not expect to see cyclists on the road, they will not notice them. Fyhri and Bjørnskau (2013) noticed that cycling becomes a lot safer when there are more cyclists around, just because other road users are looking out for cyclists once a critical mass has been reached.

Being able to park a bike safely is important to a cyclist, table 3.8.2 shows that the Cestrian respondents to the questionnaire did not agree on whether parking possibilities in the current situation were encouraging or discouraging. Most likely, people find parking facilities encouraging when they are provided, while finding it discouraging that safe bike parking is not possible everywhere.

For the English respondents, having or lacking shower facilities at their destination is more important than it is for the Dutch respondents, even though many people still see it as having no influence. This shows a mayor difference in how cycling is seen in these countries. Cycling in the Netherlands is a regular mode of transport, whereas in England, cycling is seen as a very active mode of transport or a sport that can also be used to get somewhere. This is partially a mind-set, and partially due to the fact that cycling on English hilly terrain requires a lot more effort and sportiness than cycling on mostly flat roads in the Netherlands does. Even though Chester is flat for English standards, it is probably as hilly as it possibly gets in the Netherlands, most places there being practically flat.

The difference between the influence of habits in the UK and the Netherlands makes sense, since most Dutch respondents did have a habit of cycling, therefore their current habit was encouraging, and most English respondents did not have this habit currently, making their habits mostly discouraging. Tiemeijer, Thomas & Prast (2009) show that habits are very strong and hard to break, so most people who scored habits being of no influence, probably had habits that were actually of negative influence for them to start cycling.

Statistically insignificant differences

As mentioned before, even though the factors in excluded from table 3.8.2 have no statistically significant difference in mean values, there may still be important differences in the spread of answers given. Also, some results that are similar for both countries are quite interesting. Note that trip distance and duration in this table shows how encouraging or discouraging these were, contrary to the factual length discussed earlier in this paragraph.

Figure 3.8.1 showed that cycling in the Netherlands is (subjectively) safer than cycling in the UK. This means that Dutch cyclists need to pay less attention to other road users and their own safety, and are able to enjoy their ride much more. This explains why attractiveness of surroundings is more encouraging in the Netherlands than it is in the UK.

Source: http://goo.gl/JmY2Kq

While bad weather is approximately equally discouraging in both countries, the responses show that good weather is more encouraging in the Netherlands. This gives some insight into what sort of people cycle, in the UK, cycling is more like a lifestyle choice and those people who cycle will do whenever the weather allows them to. This kind of cyclist can also be found in the Netherlands, but most cyclists in the Netherlands will be less fanatical than the English cyclists, thus being more encouraged by good weather instead of cycling whenever possible.

“The skills and fitness required for cycling” are seen as more encouraging in the Netherlands. This is mainly due to the lower number of people who don’t think they have the skills or fitness required. Again, “no influence” was scored a lot in the Netherlands, since having proper fitness or skills is not necessarily encouraging to cycle more. Arguably, more fitness is required in England as well because the terrain is less flat.

There are a couple of factors that show a difference in the image cycling has in the two countries. Health benefits are more encouraging for the English cyclists because cycling is seen as a sport that can also serve as a means of getting to a destination. People in the Netherlands do not really see it as sport, but it is to them a mode of transport just as a car or bus would be. This is also evident in the factor “Riding past a diversity of functions (e.g. shops and pubs)”. This factor is more encouraging to Dutch people since the bike, to them, is a mode of transport that can easily stop somewhere to do some shopping. British cyclists are working out and travelling to their destination, stopping halfway to shop does not make sense from this mind-set.

The respondents’ attitudes towards using a car as a mode of transport is more encouraging to cycle to the respondents from the Netherlands. This is mainly because most respondents in the Netherlands cycled, and not driving a car anymore is of course more discouraging to an inveterate driver than it is to someone who already cycles occasionally or even all the time.

The feeling of independence people get when cycling is the same in the UK and the Netherlands. A cycling network that allows more independent route choices apparently does not influence this feeling greatly.

Getting or not getting support from family or the university is said to be of no influence in either country. Paragraph 3.5 already discussed that this may be underestimated by the people filling out the questionnaire, cycling to the University would get a lot less attractive if the University did not support cycling at all and would therefore not provide good bicycle parking facilities. It will be interesting to see if the upcoming opening of an extra entrance to the university grounds from the bike and foot path on the north side of the campus will convince more people to cycle to the campus.

3.9 Comparison findings

This paragraph summarizes the most important findings from the comparison between the UK and the Netherlands, as set forth in paragraph 3.8. Three main findings are shortlisted and explained further in the corresponding paragraphs below. The most important findings in the comparison are:

- A number of factors increase in importance when safety stops being a major issue;
- A better cycling network and better safety does not improve independence;
- Safety is partially infrastructure, partially driver attitude and partially familiarity.

In the UK, safety is a major issue for cyclists. So much so that the lack of safety nullifies a number of factors that would otherwise encourage cycling. These factors, that people generally enjoy in the Netherlands, can apparently only be enjoyed once the major concern that is safety has been reduced to something a cyclist only needs to keep in the back of his or her mind. The factors this research has identified as such are relaxation and enjoyment of surroundings.

In the British findings, it already became clear that the feeling of independence one gets from cycling is underappreciated by non-cyclists. The comparison has shown that the encouragement a cyclist gets from independence does not increase when the cycling network and the safety improve, even though these improvements allow a cyclist more freedom in route choice.

The issue of safety was also discussed in the British findings, but it returns here since it is such an important topic for English cyclists. Cycling needs to become safer in the UK, and not just by taking the cyclist off the main road. It is often necessary for cyclists to use the main road, even if it is only for a short stretch, and it is also often simply more practical to use a main road rather than a cycle track that cannot lead you where you need to go as easily. Building more cycling specific infrastructure will help, but it should be only one in a package of measures. This package then, should also contain driver awareness measures and measures that can work to take away hostility in drivers. More details and ideas for possible measures will be given in Chapter 5.

This concludes the chapter on the main research and the analysis of its findings in Chester and Leeuwarden. The following chapters will further explain some of the findings set forth here and list a number of possible measures before concluding and making recommendations.

4 Explanatory factors

This chapter contains a number of observations and other factors that may offer additional explanations for differences found in Chapter 3.

4.1 Field assessments

One possible field of explanations is to be found in infrastructure and existing behavioural patterns that stand out, an analysis of this will be given in this paragraph. These findings are derived from general assessments made by cycling around the city of Chester and exploring its infrastructure.

Most people cycling in Chester cycle by themselves, only occasionally does one see two cyclists commuting together. This might not be very different to the situation in the Netherlands, where however the chance that you find someone to ride along with or you happen upon someone you know while cycling is a lot higher. This is a further illustration to the kind of people cycling in England.

The cheapest (second hand) bikes in England are more expensive than they would be in the Netherlands. The bikes that are usually the cheapest in the Netherlands however, are the bikes with one gear or at best three to five hub gears. These bikes are not very common in England, since bikes with derailleur gears are much more useful on roads that are less flat than the Dutch roads.

An interesting phenomenon happens when a weekend has had good weather for cycling. After such a weekend, a lot more cyclists are to be seen commuting the next couple of days, even sometimes when it rains on those days later in the week. This shows how closely related sports and leisure cycling in the UK is to cycling for utilitarian purposes. A good weekend, presumably filled with cycling, or maybe just filled with seeing people ride bikes, reconnects people with the positive sides of cycling and start them thinking again about doing their commute on a bike.

Most cyclists seem to either stick to dedicated infrastructure as much as possible or stick to the main roads, a combination of both does not seem to be very common. Cycling on a bike path (often being a shared use path) is indeed quite different from cycling on a road among cars. The first is safe but slow, cycling within a social context where different types of users are helpful towards one another (although not very fast in doing so). In the second situation, the bike becomes much more like a motorcycle, moving fast in a hostile, high-adrenaline environment. Some situations of course require a cyclist to make use of the other situation, though the first group of cyclists tends to stick to sidewalks in those situations where bike infrastructure is not available.

Cycling on shared use paths within the bike network results in conflicts between cyclists and pedestrians / dog walkers. An interviewee told a story of an extreme case: "*I saw one chap, it was quite dark and he had lights on so he was doing everything perfectly alright, and I suddenly saw him flying up in the air. I couldn't work out what had happened, he was about a hundred yards ahead of me. And it was somebody who had a dog on one side of the cycle path, and he was on the other side of the cycle path and there was a lead which you couldn't see.*" These conflicts, together with the effects of often badly kept paving result in low cycling speeds. Maintenance and upkeep is often minimal, due to budgeting and unclearness of task distribution between different parties. Most bike paths are planned in otherwise lost space, sometimes running under signs for the main road that is next to it. Though it is great to have at least some dedicated space, this kind of planning makes infrastructure patchy and irregular.

Figure 4.1.1: Bikepath underneath a traffic sign

Brits walk much more than Dutch people would, a daily walking distance of up to two miles (three km) each way is very normal, and longer distances are not unheard of either. This explains why a lot of students do not use bicycles, most students live within a very short walking distance of the University, and the city is also not very far off, all well within those two miles.

4.2 Local policies

The Dutch city of Groningen shows how much influence local policies can have over the years, so a review of the policies will make up the contents of this paragraph. The paragraph summarizes local policies and provides some judgement on these policies and their implications.

Chester

In its Local Transport Plan, Cheshire West sets forth its integrated transport strategy for the period of 2011 to 2026 (Kent, 2011). This strategy includes a number of plans and targets for cycling. The council views cycling (along with walking) as a healthier lifestyle and a smarter choice, seeing a lot of potential for cycling in increasing fuel prices as well. One of the ways they wish to improve the number of cyclists is by integrating cyclists in their “smarter choices agenda”.

“There has been considerable investment in the local cycling network over the last ten years.” Further ambitions are to improve local links to the cycling network, also improving the connection between the local recreational networks and the national cycle network. Short term policy regarding infrastructure is to ensure that new highway and development schemes meet the needs of cyclists and pedestrians and to make use of other processes to improve situations for cyclists. In the long term, Cheshire West wishes to ensure that design guides have better standards for cyclist and pedestrians and improve safety. They also want to promote the development of footpath and cycle networks using canals, the Public Rights of Way network and other "green corridors". Basically, they do not plan on structurally doing much to the cycle network, improving bits and pieces here and there and supporting the creation of more paths when opportunities arise. They do not commit themselves to make any improvement for cyclists, they only show willingness to utilize opportunities. The council opts for opportunistic piecemeal improvement, not strategic vision for infrastructure.

On the non-infrastructural side, Cheshire West takes a similar position. All schools in West Cheshire have been required to have a travel plan that includes cycling, not specifying how cycling should be included. The council further states they want to “promote cycling tourism” and get more participants for existing adult cycling training schemes.

The council feels that there is a “need to respond to complaints about the small minority of cyclists who fail to comply with highway regulations, or who cycle inconsiderately on multi-user and shared paths”. They furthermore wish to “encourage cyclists to abide with highway regulations and promote a more considerate approach to cycling when using shared paths”. It seems here that in the occurrence of a conflict, the council assumes that the cyclist is at fault, for they could have talked about pedestrians and dog owners behaving inconsiderately towards cyclists. This is not saying that cyclists are never to blame, but they are probably not the only ones at fault either, and one ill-considered move may make someone look like an inconsiderate cyclist while they may behave decently most of the time. Again, some cyclists are as the council seems to see them, but it is not all black and white.

In the focus groups used to create this document, increasing cycling was strongly supported, and the overall tone towards cyclists in this document is encouraging. A more pro-active positioning however would have been beneficial.

Leeuwarden

The city of Leeuwarden has a comparable Municipal Traffic and Transport Plan for the period of 2011 to 2025 (Leeuwarden, 2011). The bicycle specific sections of this are further specified in a separate document (the "Richtingwijzer Fiets"), but this document did not add much for the purpose of this study since this only applies and elaborates on the policies stated in the traffic and transport plan.

42% of all trips under 7,5 km made in the city of Leeuwarden are made by bike. In the area within the ring road, bikes get priority at intersections, since flow of bikes is seen as more important in this area then flow of cars. Even though the city already have an extensive bike network, they aim to further extend it, also adding more bike parking to accommodate the large number of users of this network. The city will continue improving the prioritising of bikes at traffic lights, implementing devices that give cyclists green light sooner in rainy conditions and adding waiting time predictors for cyclists. The city is currently proud owner of two bike transfer points, shown in figure 4.2.1, where you can park a car and continue by bike and wishes to increase the usage of these points and potentially add more. All they are doing is continuing projects that have been going for a while, but they are doing so structurally and effectively.

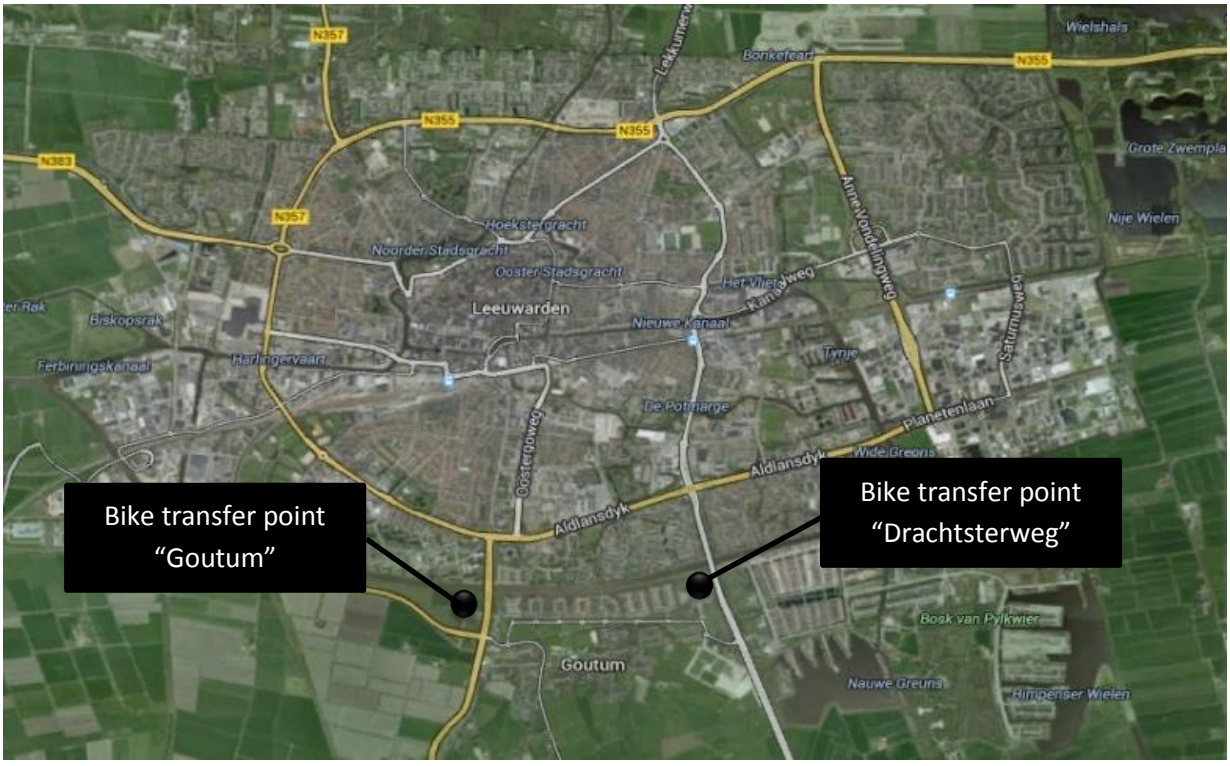


Figure 4.2.1: Locations of bike transfer points in Leeuwarden (NL) source map: maps.google.co.uk

4.3 Other explanatory factors

This paragraph describes other factors that can explain differences found between the Netherlands and the UK.

One thing that shows just how much of a lifestyle cycling is in Britain, is the amount of magazines on cycling. A big magazine store in Chester had 32 magazines on cycling, 20 of which were on road / race bikes, 10 on mountain biking and bmx, one on electric bikes and there was one specifically lifestyle oriented road bike magazine. Even though most magazines were not specifically about lifestyle, the sheer amount of magazines shows how committed those who do cycle are to cycling. For comparison, a big magazine store in the Netherlands had 19 magazines on cycling: 10 on mountain biking, 6 on road / race bikes, 2 on recreational cycling and 1 on cycling lifestyle, not all of these magazines were in Dutch. Since people tend to read magazines about the things that are most important in their lives, it is very telling that there appears to be a bigger market for cycling magazines in Britain then there is in the Netherlands, especially when the number of different magazines is related to the number of cyclists. Furthermore, it shows again that cycling in Britain is mostly about sports, since there were no magazines on recreational cycling, whereas there were at least some of those in the Netherlands.

5 Measures

The detailed analysis in the chapters leading up to this will enables this chapter to list a number of recommended measures answering the question: “How does this knowledge translate into useable advice for English and Dutch cities?” Furthermore, this chapter lists a number of suggestions for generating a larger mode share of cyclists in the UK.

The UK

Figure 5.1 brilliantly shows the model of diffusion of innovation by Rogers (2003), which applies to cycling in the UK very well, even though cycling is not a new product, it is a newly re-invented product for many. Currently, most cyclists in the UK see cycling as the early adopters see the product in the picture; brilliant, they will even want to build my lifestyle around it. To get from this group to an early majority, the picture shows that there is a gap, a chasm that is to be cleared. The challenge at hand is to clear this chasm and get an early majority to cycle. This is already starting to happen now in the UK. To be able to properly clear this chasm, more people need to start seeing cycling as an ordinary mode of transport, or a useful tool.

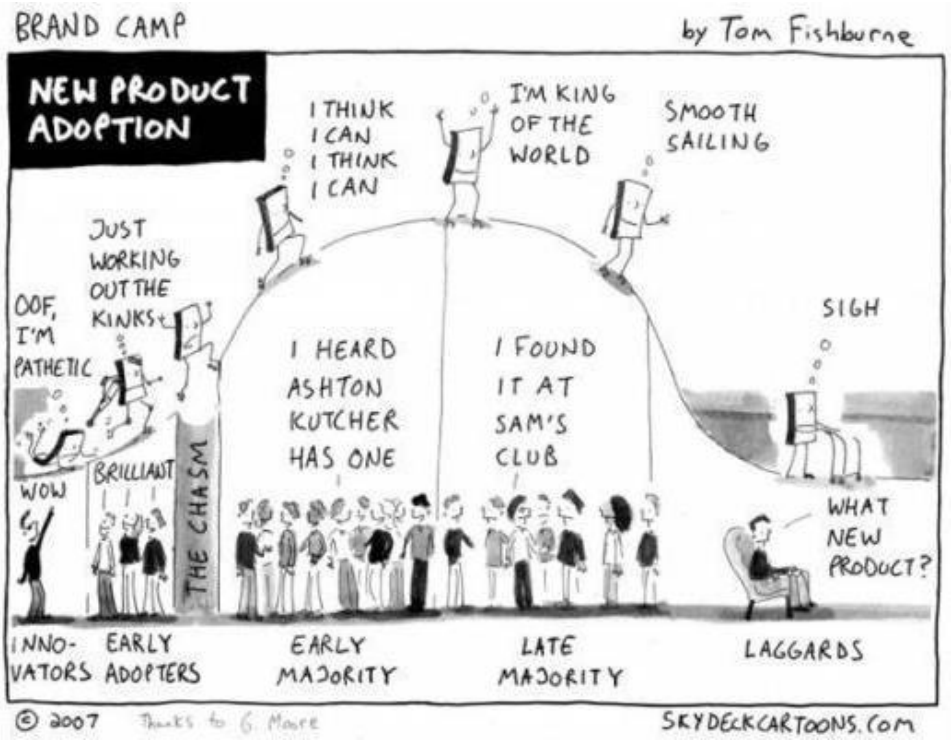


Figure 5.1: Rogers’ Diffusion of Innovation model illustrated

Any efforts to get more people cycling in Britain have to start by showing a wide variety of people that cycling is an option for them. Show people how you can use a bike without needing all kinds of specialist gear. Show that there are more practical bikes on the market than the common sport bikes. Furthermore, show different possibilities, like combining train and bike to reach a destination. Show cycling as something ordinary, to get people who are not enthusiastic about cycling and who do not want to be full on cyclists to use a bicycle as a tool. Imagine only ever seeing car enthusiasts driving impractical sports cars, antique cars or dune buggies. Unless you want to become part of that group, you would not easily consider buying and using a car, certainly not for practical purposes. These enthusiasts are crucial, but not everybody can or wants to become an enthusiast as well. To promote cycling successfully, start close to home and support family and friends to do some cycling, stressing that they do not have to become full on cyclists if you are. Once you can convince people close to you, you can start convincing others as well.

This research has shown that price differences between cycling and other modes of transport are underestimated as well as the sense of freedom that comes with cycling. So sit down and calculate how much you are really saving by cycling in terms of fuel, maintenance, or even insurance, taxes

and car payments if you do not need a car at all anymore. And see what you could be doing with all this money. Freedom can be expressed very well in different media, as graphic designers will be able to tell you all about. But the best way of course to show this to people is by letting them experience it. This can be on a personal level: taking people out for a ride, or on a larger scale: having a few proper bikes at large companies for people to try and see for themselves what it is like to cycle to and from work.

As discussed in Chapter three, safety is currently a major issue in the UK. Solving these problems in active safety requires measures in infrastructure, driver training and public image of cyclists.

Infrastructure must be added according to a vision, so that a useful network can be built rather than one that grows wherever opportunities arise. Make a plan of the ideal bike network, linking important origins and destinations. Prioritise which pieces of this plan are most pressing / important by looking at safety and gaps in the current situation. The objective is not to get everything in the plan done in the next five, ten or even twenty years, but you need something to work towards. In designing and building the actual infrastructure, utilize the knowledge that is available on it and learn from successes or mistakes of the past.

Driver training in expecting cyclists and how to deal with cyclists is hard to implement in the UK. The most likely long-term solution would be to get attention for dealing with cyclists in driver education programmes, but since attending driving schools is not required to get a license, this would be hard to achieve. Public campaigns for cycle safety may have some effect, but only when executed using psychological insight. The best solution would be to have every driver experience the situation from a cyclist's point of view, possibly in the form of campaigns showing how cars could behave around cyclists and how little sacrifice this takes from the motorist. Campaigns showing examples of bad behaviour generally do not work.

The best way to get drivers to notice cyclists is to have a lot of cyclists. Some cyclists try to solve this visibility problem through reflective clothing, which makes others who do not wear it stand out even less. On top of that, Ian Walker's research on drivers overtaking cyclists (Walker, 2006) suggests that by looking more experienced in this clothing, drivers will leave less space between their car and you when taking over. One idea is to add figures along the side of the road that remind drivers of the possibility of seeing cyclists. In the small Dutch village of Overschild, drivers are reminded that they are driving within a social environment by metal figures placed alongside the road, as shown in figure 5.2. These figures are known as reminders.

Figure 5.2: Examples of reminders in Overschild (NL) source: Google Streetview

In theory something as minor as a bicycle figure drawn near the edge of the road could already have the desired effect. Driver behaviour on Garden Lane in Chester does however indicate it that this does not work well, here this has been executed to help show that the street is two-way for cyclists and one way for cars, as shown in the big picture in figure 5.3, the beginning and end of this street are shown as well. Even with these signs implemented, many motorists still do not expect oncoming cyclists. These measures might also suggest that on a street that does not have these markings a cyclist should not be expected, making cycling there more dangerous.

Figure 5.3: Markings on Garden Lane in Chester (UK)

Bicycle facilities (other than infrastructure) are currently quite reasonable, even though they are not as widespread yet as they might be. The best way to get from this point onward, is to seize every opportunity presenting itself to add or improve facilities, much like the council of Cheshire West is proposing in their transport plan (Kent, 2011).

Media coverage has a lot of influence on cycling in the UK, this has been a negative influence in the past, but when properly used, media can also be of assistance. Whenever there is bad media coverage on cars, e.g. reports about congestion or rising fuel costs, use these reports in your favour by contrasting this with cycling.

The Netherlands

Cyclists in England see cycling as a sport more than anything else. When cycling for sport, you really want to be able to cover as big a distance as you can, so commuting long distances by bike is not time-consuming, or bad because you arrive all sweaty, it is a good workout. Where currently the electrically assisted bicycle is enabling commuters to travel longer distances by bike in the Netherlands, promoting commuting by bike as a sport can also get people to start cycling more and for longer distances. Especially if one can switch between cycling and driving: Drive a car in the morning, cycle back, cycle to work the next day and drive back. Or even better: get a lift for you and your bike each morning and combine relaxation, working out and going home by cycling back.

On top of that, since people in the Netherlands do not really see cycling as a sport, health benefits of cycling remain underexposed. Drawing special attention to health- and weight loss potential can get more people to cycle. This has to be treated carefully though, since seeing cycling as a sport may put

off other people. The sportiness of cycling should be emphasized only to specific target audiences, for instance by relating it to a specific lifestyle or a specific type of bicycle.

A lot of the respondents from the Netherlands were positive about cycling through an area with a diversity of functions. Promoting the ease of stopping at various places for quick errands while on your way home can also have positive effects, especially in the competitiveness of the bike and the bus.

This concludes the main chapters of this report, the following chapter will restate all conclusions drawn in the previous chapters. A shortlist of all measures found in this chapter will be given in the final chapter of this report: the recommendations.

6 Conclusion

Looking back at the main question posed in the introduction, this chapter concludes the most important findings of the research. So, where do intrinsic motivations for cycling in Chester (UK) differ from those motivations in a comparable Dutch town, how can these differences be explained and how can they be used?

Existing research has shown a lot of possible intrinsic motivations for cycling, resulting in a long list of factors used in this research. This list of factors was divided into 5 groups each containing a different aspect of cycling:

- Trip characteristics;
- Trip circumstances;
- Trip background;
- Personal background;
- Personal image.

Each of the 38 factors listed could potentially be either encouraging or discouraging. Placing the groups of factors into Ajzen's theory of planned behaviour (1991) showed that some of the factors work towards forming intentions for cycling while most of them work as barriers positively or negatively after this intention has been formed. A number of these factors were found to be discouraging in some cases, but never really encouraging.

A number of differences between Chester (UK) and Leeuwarden (NL) were found in these intrinsic motivations, showing a couple of themes emerging. As expected, factors relating to infrastructure and cycling network were found to be more encouraging in the Netherlands. Safety is a lot more encouraging in the Netherlands than in the UK, leading to more enjoyment while cycling. The influence of weather, function diversity of surroundings and health benefits show that cycling in the UK is seen more as a sport then a mode of transportation, explaining why shower facilities are more influential there as well. There are some important differences between how people who don't cycle view cycling and how people who do cycle find it too, cyclists judge freedom and price difference as more encouraging than non-cyclists.

This research has resulted in four major findings:

- Cycling has to be salient before any other factors come into play;
- Safety is partially infrastructure, partially driver attitude and partially familiarity;
- A number of factors increase in importance when safety stops being a major issue, mainly enjoyment and relaxation while cycling;
- A bike is a lifestyle for most in Britain, it is a tool for most in the Netherlands.

This knowledge translates into the following useable advice. English cities should work on safety systematically, working on infrastructure, driver attitude towards cyclists and drivers' familiarity with cyclists, taking a systematic approach within these subjects as well. To promote cycling in England, get people to see cycling as an option for them, whether or not it is viable option at that time, being part of the equation is the first step. To get more people into cycling, show how cycling can be useable as a tool rather than it necessarily being a lifestyle, which it is for the current cyclists, who are enthusiasts. Dutch cities can encourage even more cycling by expressing that people can show sportiness by cycling long distances. For specific audiences, showing that cycling is still a sport and an active mode of transport can help promote cycling through health benefits. Since cyclists seem to enjoy the ease of running quick errands while cycling, this can also be a selling point to the people thinking about cycling for utility. A list of these measures can be found in the next chapter.

This covers all aspects of the research question and concludes this research, which has led to some interesting new insights. The next chapter will give some recommendations for further research and a shortlist of recommended measures that have arisen from this research.

7 Recommendations

This research has led to a number of recommended measures as well as finding a number of subjects that would be interesting to look into further.

English measures

- Work on safety systematically in infrastructure, driver attitude and driver familiarity with cyclists;
- Get people to see cycling as an option for them, viable or not;
- Show how cycling can be useable as a tool rather than it necessarily being a lifestyle;
- Start close to home, and get people close to you to give cycling a chance.

Dutch measures

- Show sportiness of cycling in long distances;
- Promote health benefits to specific audiences;
- Promote the ease of running quick errands while cycling.

Further research

The following questions for further inquiry arose in this research.

This study was unable to link education levels to motivations for cycling. Are there important differences in motivations between people with different levels of education? Steadiness of employment could not be tested in this research either since most respondents were in a steady situation. Is there a link between steadiness of employment and cycling frequency?

The data in this research suggests cycle hire schemes only attract existing cyclists who do not have a bike at that point in time and space. Can this be confirmed, and what does this mean for implementation of these schemes?

These factors have been found to be able to discourage people from cycling, but not to actively encourage:

- Type and quality of infrastructure;
- Attitudes towards cars, public transport & walking;
- Having the skills and fitness required;
- Support from family or university.

Can these findings be supported by further research, do more factors work this way, and what does this imply?

This research has found a connection between the amount of cyclists someone knows and whether or not this person cycles. To what extent does knowing other people who cycle encourage someone to cycle themselves, or is knowing other cyclists just an effect of cycling yourself? In other words: which is cause and which is effect or how do these phenomena relate?

Final statement

This study has hereby resulted in useful knowledge about cycling and usable advice for all kinds of parties that concern themselves with cycling. It has also raised a number of interesting questions for further research. The study has shown that even though the Netherlands is ahead in cycling numbers, it can still learn from other countries. This in itself makes for a very interesting and useful conclusion.

Bibliography

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes,* 50, pp. 179-211.

Aldred, R., Jungnickel, K. (2012). Cycling Cultures. *Summary of key findings and recommendations.* London: University of East London.

Aldred, R. (2008). Cycling Cultures: Some Initial Findings from a Narrative Research Project. Rough draft for Cycling and Society conference attendees.

AnloInfo (2000). Getting a Driving Licence in the UK. Seen on 20-05-2014 at: http://uk.angloinfo.com/transport/driving-licences/getting-a-driving-licence/

Bamberg, S. (2012). Understanding and Promoting Bicycle Use - Insights from Psychological Research. In Parkin, J. (ed.) Cycling and Sustainability (Transport and Sustainability, Volume 1). Bingley: Emerald Group Publishing Limited. pp. 219-246.

Bonham, J., Wilson, A. (2012). Women Cycling Trough the Life Course: An Australian Case Study. In Parkin, J. (ed.) *Cycling and Sustainability (Transport and Sustainability, Volume 1)*. Bingley: Emerald Group Publishing Limited. pp.111-130.

Cialdini, R.B. (2009). Invloed. *De zes geheimen van het overtuigen.* Den Haag: Academic Service.

Cox, P. (2005). Conflicting Agendas in Selling Cycling. Chester: University of Chester, United Kingdom.

CROW (2007). Design manual for bicycle traffic. Ede: CROW.

Denscombe, M. (2003). The Good Research Guide. *For small-scale social research projects.* Maidenhead Philadelphia: Open University Press.

Duncan, J. (1984). Selective Attention and the Organization of Visual Information. *Journal of Experimental Psychology: General* 1984, Vol. 113, No. 4, pp 501-517.

Touwen, M. (1997). Fiets in vervoermanagement. The Hague: Ministerie van Verkeer en Waterstaat.

Fasolo, B. et al. (2007). From describing to nudging. *Choice of transportation after a terrorist attack in London.* London: London School of Economics.

Fietsberaad (2013 a). *Bumping along rather than making a detour.* Seen on 21-02-2014 at http://www.fietsberaad.nl/index.cfm?lang=nl&repository=Bumping+along+rather+than+making+a+detour.

Fietsberaad (2013 b). We fietsen verder. *Fietsverkeer* 12:32, pp. 6. http://www.fietsberaad.nl/library/fietsverkeer/Fietsverkeer_32.pdf

Fietsberaad (2007). De invloed van het weer op het fietsgebruik en het aantal fietsslachtoffers. Rotterdam: Fietsberaad.

Forester, J. (2001). The Bicycle Transportation Controversy. Seen on 24-05-2014 at http://www.johnforester.com/Articles/Facilities/TransQuart01.htm.

Fyhri, A., Bjørnskau, T. (2013). Safety in Numbers - Uncovering the mechanisms of interplay in urban transport with survey data. Oslo: Institute of Transport Economics.

Heinen, E., Handy, S. (2012). Similarities in Attitudes and Norms and Their Effect on Bicycle Commuting: Evidence from the Bicycle Cities Davis and Delft, International Journal of Sustainable Transportation, 6:5, pp. 257-281, DOI: 10.1080/15568318.2011.593695.

Heinen, E., Wee, B. van, Maat, K. (2010). Commuting by Bicycle: An Overview of the Literature, Transport Reviews: A Transnational Transdisciplinary Journal, 30:1, pp. 59-96, DOI: 10.1080/01441640903187001.

Huffington post (2013). *London Cyclist Killed: Outrage Over Six Deaths In Just Nine Days*. Seen on 30-04-2014 at www.huffingtonpost.co.uk/2013/11/14/London-cyclist-killed_n_4272657.html

Kahneman, D. (2012) Thinking fast and slow. London: Penguin Books Ltd.

Kent, S. (2011). Local Transport Plan. *Integrated Transport Strategy 2011-2026.* Seen on 23-5-2014, at http://www.cheshirewestandchester.gov.uk/your_council/policies_and_performance/council_plans_and_strategies/local_transport_plan_200.aspx

Kevin J. Krizek (2012), Chapter 5 Cycling, Urban Form and Cities: What do We Know and How should We Respond?, in John Parkin (ed.) Cycling and Sustainability (Transport and Sustainability, Volume 1), Emerald Group Publishing Limited, pp.111-130

Leeuwarden. (2011). De complete stad bereikbaar. *GVVP 2011/2025.* Seen on 23-5-2014 at http://www.leeuwarden.nl/artikel/2010/gemeentelijk-verkeers-en-vervoerplan

Macmillan, A., Woodcock, J. (2013). Understanding London cycling trends. *System structure and behaviour using system dynamics modelling.* Cambridge: CEDAR.

Parkin, T., Ryley, T., Jones, T. (2007). Barriers to Cycling: An Exploration of Quantitative Analyses. In Horton, D., Rosen, P., Cox, P. (ed.) *Cycling and Society.* Aldershot: Ashgate Publishing Limited. pp. 67-82.

Pooley, C. et al. (2011). Understanding Walking & Cycling: Summary of key findings and recommendations. Lancaster: Lancaster University.

Trochim, W.M.K. (2006). Research Methods Knowledge Base seen on 07-05-2014 at http://www.socialresearchmethods.net/kb/stat_t.php

Rogers, E. M. (2003). Diffusion of innovations (5th edition). New York, NY: Free Press.

Shove, E., Pantzar, M., Watson, M. (2012). The Dynamics of Social Practice. *Everyday life and how it changes.* London: SAGE publications Ltd.

Sustrans. (2013). Welsh Government launch Active Travel (Wales) Bill. seen on 22-05-2014 at http://www.sustrans.org.uk/wales/policy.

Tertoolen, G., Lankhuijzen, R. (2013). Onbewuste invloeden op gedrag. *Beleidsimpuls verkeersveiligheid.* Utrecht: XTNT Experts in Traffic and Transport.

Tiemeijer, W.L., Thomas, C.A., Prast, H.M. (ed.)(2009). De menselijke beslisser. *Over de psychologie van keuze en gedrag.* Amsterdam: Amsterdam University Press.

Transport for London (2013). Attitudes towards Cycling . *Annual report 2012.* London: Transport for London.

Vivanco, L.A. (2013). Reconsidering the Bicycle. *An Anthropological Perspective on a New (Old) Thing.* Abingdon: Routledge.

Walker, I. (2006). Drivers overtaking bicyclists: Objective data on the effects of riding position, helmet use, vehicle type and apparent gender. Bath: University of Bath.

Appendix 1 : List of factors with examples

This appendix contains the full list of factors from the literary review, giving an example short for how each factor is or can be influential.

Trip characteristics

Influential factors in this group describe the physical characteristics of a trip, as perceived by the person making that trip, i.e. actual trip distance is not very important, someone's view of the distance however is very important in the process of making a decision between modes.

- Location of trip origin within network;

When the origin of most trips is not close to appropriate infrastructure or this requires a big detour.

- Coherence / continuity of infrastructure;

Having to stop frequently because a cycle path is not connected to other roads very well.

- Trip distance;

Too long or too short a distance for the bicycle to be attractive.

- Trip duration;

The bike becomes an attractive alternative when other modes take longer to reach a destination.

- Type and quality of cycling infrastructure;

Badly paved cycle lanes will be less attractive than well paved, completely segregated paths.

- Shared or segregated infrastructure;

Having to share the infrastructure with cars or pedestrians.

- Perceived active safety;

Feeling safe is probably more important than being safe, this has to do with infrastructure issues as well as, for example, media coverage.

- Perceived passive safety (parking);

Feeling the bike is (or can be) safely parked so your expensive road bike will not get stolen.

- Shower and dressing facilities at destination;

Arriving all sweaty seems to be putting many people off.

- price versus other modes of transport;

In many cases the bike becomes an attractive alternative because other modes are much more expensive.

Trip circumstances

The differences between possible kinds of trips, and all the implications that these differences entail are included in this group of factors.

- Trip purpose;

Cycling to the shop, cycling to work and cycling to the gym all have specific pros and cons.

- Fellow travellers;

Having to bring other people might be a downside, while riding along with others might help someone cycle more regularly.

- Need to bring luggage and type of luggage;

Needing specific panniers or even a cart to carry luggage is probably off-putting.

- Dependence or independence;

Not having to depend on others while riding, or having to depend on others for bike maintenance.

- Freedom in travel times;

Being able to go where you want (within a certain range), when you want.

- Restrictions by work;

If someone's work requires use of a car, cycling in becomes much less attractive.

Trip background

A trip does not take place in a neutral environment, the following factors have quite a big influence on mode choice. Even on a smaller scale (route choice) these "background characteristics" play a circumstantial role in people's choices (see for example Fietsberaad, 2013).

- Function diversity of surroundings;

Being able to stop for this or that on the way.

- Attractiveness of surroundings;

Enjoying the surroundings while getting where you need to go.

- Hilliness;

Having to cycle up steep hills going into work.

- Weather conditions;

Cycling is much nicer on a dry, warm and sunny day than on a windy wet day in the fall.

- Hours of daylight;

Needing to use bike lights / being less visible in the dark can be off-putting.

Personal background

Amongst others Bonham and Wilson (2012) show that in countries with low amounts of cyclists, it's predominantly white, young to middle-aged males who cycle, whereas in countries or cities with high numbers of riders, cycling women are much more commonly seen. Apparently, these personal background factors, or rather the differences in behaviour that are distinguished by these factors do make a difference.

- Sex, age, income;

Young to middle aged males with relatively high incomes seem to cycle most.

- Education;

People with higher education tend to cycle more (Fietsberaad, 2013).

- Employment status;

Someone with a steady job can move into cycling distance of that job.

- Knowing someone who cycles;

To get into cycling, knowing someone else who rides a bike seems to be very influential.

- Bike ownership including type, maintenance level and quality;

Owning a badly kept mountain bike with wide knobbed tires will not help utility cycling much

- Car ownership;

People in a household with one car cycle most (Parkin, Ryley and Jones, 2007).

- Physical ability;

Being able or unable to ride a bike in some cases supersedes all other influences. If someone just physically cannot ride a bike, everything else becomes mute.

Personal image

The factors in this group are mainly psychological; they are related to how people see themselves and how people choose to live their lives as seen from a broader perspective than the day-to-day rush of small choices.

- Attitudes towards different modes;

Someone who loves cars and driving is less likely to cycle.

- Perceived ability;

Feeling like you are not fit enough might keep many from cycling into work.

- Social norms of group / company / city / country;

It is easier to cycle when those around you support cycling, or at least are not actively against it.

- Physically active (self-image);

"I am going to cycle into work because I am a very physically active person."

- A cyclist (self-image);

"I am a cyclist, I do everything by bike if I can help it."

- Altruistic & ecologic mindedness;

"I ride because it is better for the environment."

- Image and goals in health, fitness and weight loss;

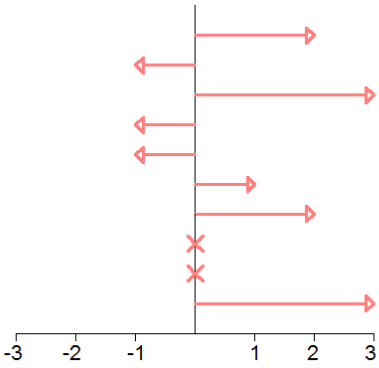
"Cycling into work makes me fitter and saves me having to go to the gym in the evening."

- Habits;

Someone who has cycling as a default transport mode means this person rides a lot more than someone who is in favour of biking but only does it after careful consideration once in a while.

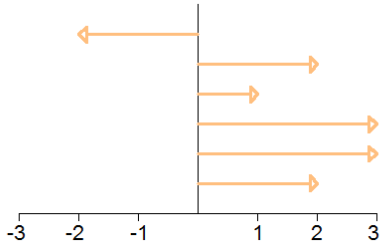
Appendix 2: example of completely filled out model

This appendix shows a completely filled out model as an example. The data for this has been generated by the author filling out the questionnaire for his own experience in England.



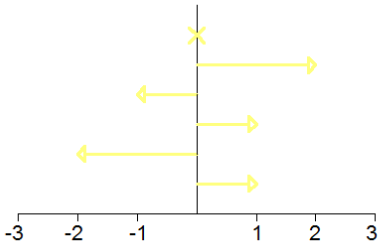
Trip characteristics
- location of trip origin within network
- coherence / continuity of infrastructure
- trip distance
- trip duration
- type and quality of cycling infrastructure
- shared or segregated infrastructure
- perceived active safety
- perceived passive safety (parking)
- shower and dressing facilities at destination
- price versus other modes of transport

Figure A2.1: Model section of Trip characteristics



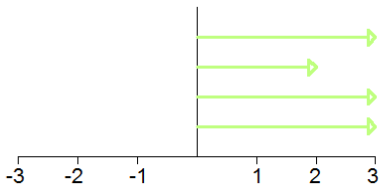
Trip circumstances
- trip purpose
- fellow travellers
- need to bring luggage and type of luggage
- dependence or independence
- freedom in travel times
- restrictions by work

Figure A2.2: Model section of Trip circumstances



Trip background
- function diversity of surroundings
- attractiveness of surroundings
- hilliness
- good weather
- bad weather
- hours of daylight

Figure A2.3: Model section of Trip background



Personal background
- bike ownership
- bike rideability
- car ownership
- physical ability

Figure A2.4: Model section of Personal background

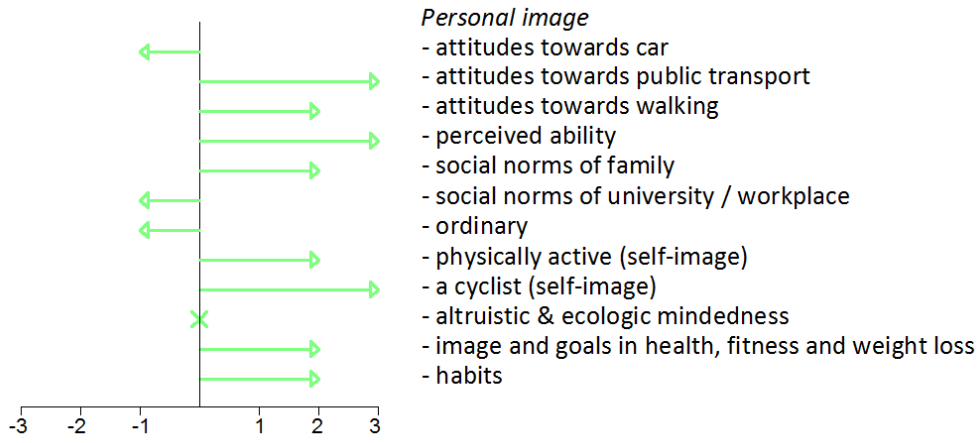


Figure A2.5: Model section of Personal image

Factors that do not fit in the model are: sex, age, income, knowing someone who cycles.

Appendix 3: Questionnaire used

This appendix shows the questionnaire used, first the English one, then the Dutch one. The online version of these questionnaires visually looked a little different, but all the contents were the same.

English questionnaire

Part 1: You and your Journey

You are now taking part in a piece of research into the reasons why people choose to utilize a specific mode of transport over the other. Specifically, why people choose to ride a bicycle and / or why they choose not to. Filling out this questionnaire should only take 5-10 minutes. You can answer each question by ticking the appropriate box or writing down your answer.

1. Please imagine a journey you regularly make and which you have made or could make by bicycle. The trip I'll answer questions about is a trip to:

Work	School	The Shop	The Pub / social

2. How do you make this trip?

	By Bicycle	By Car	By Public Transport	By Taxi	Walking
Usually					
Last time					

Other:_____

3. How long is your trip?
This trip is approximately _____ miles long

4. How long does your trip take?
This trip takes me about_____ minutes

5. What kind of cycle infrastructure could you use?
My trip is:

Entirely on cycle paths	Partially on cycle paths, partially on bicycle lanes along roads	Entirely on bicycle lanes along roads	Partially on bike infrastructure, partially among other traffic	Entirely among other traffic

6. I am a:

Male	Female	I'd rather not say

7. My age:

18-21	22-25	26-35	36-45	46-55	56-65	65 and up	I'd rather not say

8. Position at the University:

Undergraduate	Postgraduate	Faculty staff	Support staff

9. Employment status:

Steady contract or fulltime student	Temporary contract or temporary student	Freelance

Other:_____

10. How many people around you would cycle for comparable trips at least some of the time?

	None	1 person	a few people	a lot	not applicable
Family members					
Friends					
Acquaintances					
Colleagues					

11. Do you cycle?

Always	Most of the time	Regularly	Sometimes	On occasion	No	I have never considered cycling

Part 2: Your choices

In the following questions, you will be asked to score how these factors help shape your choices about why you're cycling. The scores range from "very discouraging", meaning that this factor keeps you away from cycling strongly to "very encouraging", meaning that this really attracts you in cycling. Please do keep in mind the trip you started filling this form out for. You can only pick one score per factor, you must choose the one that fits best.

12. Relevance of trip characteristics

	How important is this when choosing for or against cycling?						
relevant factor	very discouraging	discouraging	somewhat discouraging	no influence	somewhat encouraging	encouraging	very encouraging
The location of my house in relation to the cycling network							
Having to stop frequently because a cycle paths aren't connected to other roads very well							
The distance I need to travel							
How long cycling takes compared to e.g. the bus or the car							
The quality and type of infrastructure between my house and my destination							
Having to share the infrastructure with cars or pedestrians							
Feeling safe / unsafe when cycling							
Feeling my bike is (or can be) safely parked							
Having / lacking shower and dressing facilities at my destination							
The price of cycling compared to other modes of transport							

13. Relevance of trip circumstances

How important is this when choosing for or against cycling?							
relevant factor	very discouraging	discouraging	somewhat discouraging	no influence	somewhat encouraging	encouraging	very encouraging
The purpose of my trip							
Other people travelling with me							
The (kind of) luggage I need to bring							
Being dependent or independent when riding a bike compared to other modes							
Being free in what specific moment I want to travel							
The restrictions that I get from my work							

14. Relevance of trip background

How important is this when choosing for or against cycling?							
relevant factor	very discouraging	discouraging	somewhat discouraging	no influence	somewhat encouraging	encouraging	very encouraging
Riding past a diversity of functions (e.g. shops and pubs)							
Being able to enjoy my surroundings while getting where I need to go							
The hilliness of my route							
Having good weather							
Having bad weather							
The hours of daylight							

15. Relevance of personal background

How important is this when choosing for or against cycling?							
relevant factor	very discouraging	discouraging	somewhat discouraging	no influence	somewhat encouraging	encouraging	very encouraging
The type of bike I own / not owning a bike							
The rideability of my bike							
Having a car at my disposal							
Physical ability							

16. Relevance of personal image

How important is this when choosing for or against cycling?							
relevant factor	very discouraging	discouraging	somewhat discouraging	no influence	somewhat encouraging	encouraging	very encouraging
Not using my car							
Not using the public transport							
Not walking							
The skills and fitness required for cycling							
The support / discouragement I'd get from family and friends							
The support / discouragement I'd get from people at the university							
Cycling being ordinary / strange							
Being considered a physically active person							
Being considered "a cyclist"							
Cycling being better for the environment							
Health benefits / detriments from cycling							
My current habits							

Would you be willing to take part in a more detailed interview about this subject? If so, please provide your email and / or phone number.

Email	Phone number
@	

We thank you for filling this out. By doing so and handing this in to the researcher, you agree that you are happy giving us this information. We agree to keep all information strictly anonymous.

If you want to receive a (digital) copy of the finished report, please provide your email address below or tick the box labelled "see above".

Email	See above
@	

Dutch Questionnaire

Deel 1: Jij en jouw reis

Deze vragenlijst is een onderdeel van een onderzoek naar de redenen waarom mensen kiezen om een bepaald vervoersmiddel te gebruiken. Het onderzoek kijkt specifiek naar waarom mensen kiezen voor de fiets als vervoermiddel, of waarom juist niet. Het invullen van deze vragenlijst kost niet meer dan 5-10 minuten. Elke vraag kan worden beantwoord door het meest toepasselijke vakje aan te vinken of door een kort antwoord op te schrijven.

1. Welke specifieke trip zou je (overwegen om te) fietsen?
Neem een specifieke reis in gedachten. Dit mag geen recreatief / sportief fietstochtje zijn. De reis waar ik vragen over ga beantwoorden is een reis naar:

Werk	School	Winkels	Horeca / sociaal

2. Hoe maak je deze reis?

	Fietsend	In de auto	Met het OV	Met de Taxi	Lopend
meestal					
de laatste keer					

Anders:_____

3. Hoe ver is deze reis?

Deze reis is ongeveer _____ kilometer lang.

4. Hoe lang doe je hier over?

Deze reis duurt ongeveer _____ minuten.

5. Wat voor fiets infrastructuur kun je gebruiken?
Mijn reis gaat:

alleen maar fietspaden	deels over fietspaden, deels over fietsstroken	alleen maar over fietsstroken	deels over fietsinfrastructuur, deels over de gewone weg	alleen maar over de gewone weg

6. Ik ben een:

Man	Vrouw	Zeg ik liever niet

7. Mijn leeftijd:

18-21	22-25	26-35	36-45	46-55	56-65	65 of ouder	zeg ik liever niet

8. Wat is je rol bij de NHL?

Bachelorstudent	Masterstudent of hoger	Leraar / onderzoeker	Ondersteunend personeel

9. Dienstverband:
studenten: kies het antwoord dat het best van toepassing is op je studie situatie aan de NHL

Vast contract of voltijd student	Tijdelijk contract of tijdelijk student	Freelance

Anders:_____

10. Hoeveel mensen in je directe omgeving zouden een vergelijkbare reis ten minste af en toe fietsen?

	geen	1 persoon	een paar mensen	veel	n.v.t.
Familieleden					
Vrienden					
Kennissen					
Collega's					

11. Fiets je zelf?

Altijd	Meestal	Regelmatig	Soms	Af en toe	Nee	Ik heb nog nooit overwogen te fietsen

Deel 2: Jouw keuzes

In de nu volgende vragen wordt je gevraagd om de relevantie van verschillende factoren te scoren. De factoren staan genoemd in de eerste kolom, de kolommen daarna geven verschillende opties variërend van "erg ontmoedigend" wat betekend dat deze factor je in sterke mate weg houdt van het fietsen tot "erg bemoedigend", voor factoren die er sterk toe bijdragen dat je wilt gaan fietsen. Hou bij het beantwoorden van deze vragen de reis in gedachten die je vanaf het begin van deze vragenlijst in gedachten hebt genomen. Je kunt maar <u>1 score per factor kiezen</u>, kies dus degene die het beste past.

12. Relevantie van reiskarakteristieken

	Hoe belangrijk is dit als je kiest tussen wel en niet fietsen?						
relevante factoren	erg ontmoedigend	ontmoedigend	enigszins ontmoedigend	geen invloed	enigszins bemoedigend	bemoedigend	erg bemoedigend
De locatie van mijn huis in verhouding tot het fietsnetwerk							
Vaak moeten stoppen omdat fietspaden slecht op elkaar / op andere wegen aansluiten							
De afstand die ik moet afleggen							
Hoe lang fietsen duurt in vergelijking met bijvoorbeeld de bus of de auto							
De soort en kwaliteit van de infrastructuur tussen mijn huis en mijn bestemming							
Het moeten delen van de ruimte met voetgangers en automobilisten							
Mij veilig of onveilig voelen tijdens het fietsen							
Mijn fiets veilig kunnen parkeren							
Me al dan niet kunnen douchen of omkleden op mijn bestemming							
De kosten van fietsen in vergelijking met het OV							
De kosten van fietsen in vergelijking met andere vervoersmiddelen (niet het OV)							

13. Relevantie van reisomstandigheden

Hoe belangrijk is dit als je kiest tussen wel en niet fietsen?							
score / relevante factoren	erg ontmoedigend	ontmoedigend	enigszins ontmoedigend	geen invloed	enigszins bemoedigend	bemoedigend	erg bemoedigend
Het doel van mijn reis							
Medereizigers							
De (soorten) bagage die ik mee moet nemen							
Afhankelijk of onafhankelijkheid door het fietsen							
Vrijheid in het moment waarop ik reis							
Beperkingen door mijn werk							

14. Relevantie van achtergrondomstandigheden

Hoe belangrijk is dit als je kiest tussen wel en niet fietsen?							
score / relevante factoren	erg ontmoedigend	ontmoedigend	enigszins ontmoedigend	geen invloed	enigszins bemoedigend	bemoedigend	erg bemoedigend
Fietsen langs een verscheidenheid aan functies (bijvoorbeeld winkels en horeca)							
Kunnen genieten van mijn omgeving terwijl ik onderweg ben							
De heuvelachtigheid van mijn route							
Goed weer							
Slecht weer							
Het aantal uren daglicht							

15. Relevantie van persoonlijke achtergrond

Hoe belangrijk is dit als je kiest tussen wel en niet fietsen?							
score / relevante factoren	erg ontmoedigend	ontmoedigend	enigszins ontmoedigend	geen invloed	enigszins bemoedigend	bemoedigend	erg bemoedigend
Het soort fiets dat ik heb / ik heb hier geen fiets							
De bruikbaarheid van mijn fiets							
Het al dan niet beschikbaar hebben van een auto							
Mijn fysieke gesteldheid							

16. Relevantie van zelfbeeld

	Hoe belangrijk is dit als je kiest tussen wel en niet fietsen?						
score / relevante factoren	erg ontmoedigend	ontmoedigend	enigszins ontmoedigend	geen invloed	enigszins bemoedigend	bemoedigend	erg bemoedigend
Mijn auto niet gebruiken							
Het OV niet gebruiken							
Niet lopend gaan							
De benodigde conditie en vaardigheden voor fietsen							
De steun of hoon die ik van familie of vrienden zou krijgen als ik fietste							
De steun of hoon die ik van mensen op school zou krijgen als ik fietste							
Het feit dat fietsen gewoon is / het feit dat fietsen raar is							
Worden gezien als fysiek actief							
Worden gezien als "een fietser"							
Fietsen is beter voor het milieu							
Voor- of nadelen voor mijn gezondheid als ik fiets							
Mijn huidige gewoontes							

Zou je mee willen werken aan een meer gedetailleerd gesprek over dit onderwerp? Geef dan hieronder je email adres en/of telefoonnummer.

Email	Telefoonnummer
@	

Bedankt voor het invullen van deze enquête. Met het inleveren hiervan geef je aan dat je ons vrijwillig deze informatie geeft. Wij beloven tegelijkertijd je gegevens vertrouwelijk te behandelen.

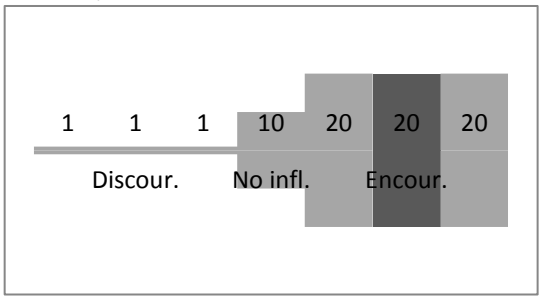
Wil je (digitaal) het eindrapport van dit onderzoek ontvangen, geef dan hieronder je email adres of vink "zie hiervoor" aan als je op de hoogte wilt worden gehouden en hierboven al je email adres hebt gegeven.

Email	Zie hiervoor
@	

Appendix 4: Summaries of responses

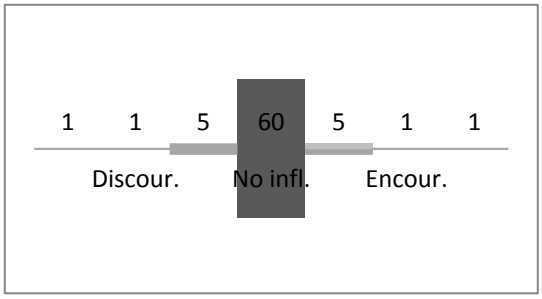
Table 3.2.1 shows a summary of the responses to all factors. This is the summarized version of all data shown in appendix 4. The first column shows each factor, the second column shows the outcome for all respondents and the third column shows the outcome for just the cyclists, selected in the same way that was discussed earlier in this paragraph. There are four basic options given in columns two and three, these are explained below, as well as the possible variations to this scale.

Positive, which means most answers were within the encouraging half of the scale, for example:



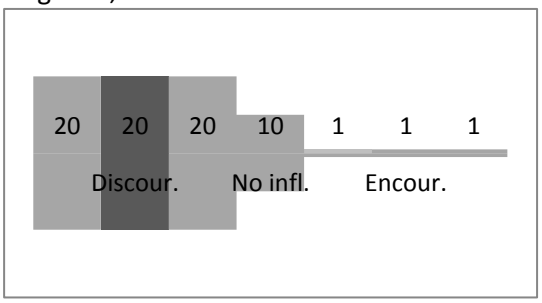
Variations to this are:
Very positive, when answers are given more on the right side of this option
Positive
Slightly positive, when answers are given more on the left side of this option, closer to “No influence”

No influence, which means almost all respondents selected the “no influence” option, for example:



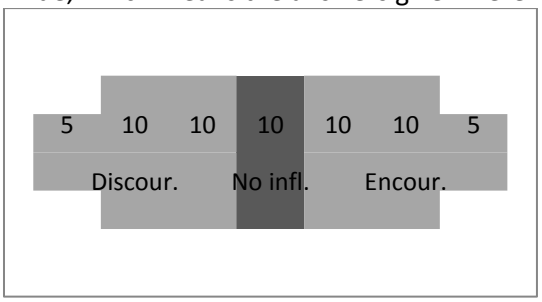
Variations to this are:
No big influence, a cross between “No influence” and “Wide” where the former option is still somewhat dominant.
No Influence

Negative, which means most answers were within the discouraging half of the scale, for example:



Variations to this are:
Very negative, when answers are given more on the left side of this option
Negative
Slightly negative, when answers are given more on the right side of this option, closer to “No influence”

Wide, which means the answers given were widely distributed across the scale, for example:



When the response to a factor is midway between two of these options, this is shown by mentioning both, separated with a “/”, for example: wide / positive. The five inconclusive factors mentioned before are colored grey in tables A4.1 - A4.3 to show their status without completely throwing this data away.

Table A4.1: Summary of response to factors (UK)

Trip characteristics	***all***	***cyclists***
Location of trip origin within network	wide	wide
Coherence / continuity of infrastructure	negative	negative
Trip distance	wide	wide
Trip duration	wide	wide
Type and quality of cycling infrastructure	wide	negative
Shared or segregated infrastructure	negative	negative
Perceived active safety	negative	negative
Perceived passive safety (parking)	positive	wide
Shower and dressing facilities at destination	no influence	slightly negative
Price versus other modes of transport	slightly positive	very positive
Trip circumstances		
Trip purpose	negative	wide
Fellow travellers	no influence	no influence
Need to bring luggage and type of luggage	negative	negative
Dependence or independence	positive	very positive
Freedom in travel times	positive	positive
Restrictions by work	no influence	no influence
Trip background		
Function diversity of surroundings	no influence	no influence
Attractiveness of surroundings	positive	positive
Hilliness	wide	wide / no influence
Good weather	positive	positive
Bad weather	negative	negative
Hours of daylight	wide	wide
Personal background		
Bike ownership	positive	positive, main
Bike rideability	positive	positive
Car ownership	wide	no infl. / negative
Physical ability	wide / positive	positive
Personal image		
Attitudes towards car	no big influence	positive
Attitudes towards public transport	no big influence	positive
Attitudes towards walking	no influence	no influence
Perceived ability	no influence	positive
Support family	no influence	no influence
Support university / workplace	no influence	no influence
Ordinary	no influence	no influence
Physically active (self-image)	positive	positive
A cyclist (self-image)	no influence	slightly positive
Altruistic & ecologic mindedness	very positive	positive
Image and goals in health, fitness and weight loss	very positive	positive
Habits	no big influence	positive

Table A4.2: Summary of response to factors (NL)

Trip characteristics	***NL***
Location of trip origin within network	positive
Coherence / continuity of infrastructure	wide
Trip distance	wide
Trip duration	wide
Type and quality of cycling infrastructure	no big influence
Shared or segregated infrastructure	no influence
Perceived active safety	wide / no influence
Perceived passive safety (parking)	positive
Shower and dressing facilities at destination	no influence
Price versus other modes of transport	slightly positive
Trip circumstances	
Trip purpose	positive
Fellow travellers	no influence
Need to bring luggage and type of luggage	negative
Dependence or independence	positive
Freedom in travel times	positive
Restrictions by work	no influence
Trip background	
Function diversity of surroundings	no influence / positive
Attractiveness of surroundings	more positive
Hilliness	no influence
Good weather	very positive
Bad weather	negative
Hours of daylight	positive
Personal background	
Bike ownership	positive
Bike rideability	positive
Car ownership	wide
Physical ability	wide / positive
Personal image	
Attitudes towards car	no influence / positive
Attitudes towards public transport	no influence
Attitudes towards walking	no big influence
Perceived ability	no influence / positive
Support family	no big influence
Support university / workplace	no influence
Ordinary	no influence
Physically active (self-image)	positive
A cyclist (self-image)	no big influence
Altruistic & ecologic mindedness	positive
Image and goals in health, fitness and weight loss	positive
Habits	positive

Table A4.3: Factors and differences between UK and NL including significance

Trip characteristics	***UK***	***NL***	***Significance***
Location of trip origin within network	wide	positive	sign.
Coherence / continuity of infrastructure	negative	wide	sign.
Trip distance	wide	wide	
Trip duration	wide	wide	
Type and quality of cycling infrastructure	wide	no big influence	sign.
Shared or segregated infrastructure	negative	no influence	sign.
Perceived active safety	negative	wide / no infl.	sign.
Perceived passive safety (parking)	wide / positive	positive	sign.
Shower and dressing facilities at destination	no big influence	no influence	sign.
Price versus other modes of transport	slightly positive	slightly positive	
Trip circumstances			
Trip purpose	negative	positive	
Fellow travellers	no influence	no influence	
Need to bring luggage and type of luggage	negative	negative	
Dependence or independence	positive	positive	
Freedom in travel times	positive	positive	
Restrictions by work	no influence	no influence	
Trip background			
Function diversity of surroundings	no influence	no infl. / positive	
Attractiveness of surroundings	positive	more positive	
Hilliness	wide	no influence	
Good weather	positive	very positive	
Bad weather	negative	negative	
Hours of daylight	wide	positive	
Personal background			
Bike ownership	positive	positive	
Bike rideability	positive	positive	
Car ownership	wide	wide	
Physical ability	wide / positive	wide / positive	
Personal image			
Attitudes towards car	no big influence	no infl. / positive	
Attitudes towards public transport	no big influence	no influence	
Attitudes towards walking	no influence	no big influence	
Perceived ability	no influence	no infl. / positive	
Support family	no influence	no big influence	
Support university / workplace	no influence	no influence	
Ordinary	no influence	no influence	
Physically active (self-image)	positive	positive	
A cyclist (self-image)	no influence	no big influence	
Altruistic & ecologic mindedness	very positive	positive	
Image and goals in health, fitness and weight loss	very positive	positive	
Habits	no big influence	positive	sign.

Appendix 5: Elaborate models

-this appendix was sent separately