Universiteit Utrecht

Experiencing urban cycling

A study to the cycling experience and the physical environment of youth studying in Utrecht

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Master Thesis
Urban Geography
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Abstract

Stimulating cycling can have a lot of benefits from health to sustainability and preventing traffic issues. A lot of cycling stimulation happens with the promotion of cycling benefits as well as adapting infrastructure and making car use less beneficial. These adaptions are mostly functional more than stimulating the cycling experience. This research uses experimental video research, showing moving images of 6 different routes to respondents which fill in a survey after watching each route. The research proves that the cycling experience is under the influence of physical environmental aspects. This concerns aspects grouped as the built environment, the green environment as well as the visual heterogeneity. The experienced travel time of a route influences the cycling experience, however the elements in this research only partially explain the experienced travel time. The impact of the experienced time on the appreciation of the route is more significantly visible than the impact of the route appreciation on the perceived time. These aspects influence the cycling experience and with this possibly route choice and cycling behaviour.

Key Words:

Cycling Experience, Experienced Travel Time, Perceived Proximity, Built environment, Visual Heterogeneity, Mixed-Use.

Preface

I have written this thesis about the cycling experience of youth studying in Utrecht to graduate from the Master 'Urban Geography' at the University of Utrecht. The research has been conducted between January 2015 and August 2015.

Ever since I was young I have traveled endless kilometers by bike in the Netherlands, from my hometown to my high school and recently while trying to race the congested streets in Utrecht. Abroad I have rented a bicycle in almost every country I visited. Every time I have been amazed by how cycling is taken for granted in Dutch cities and how the bicycle is almost self-evidently seen as the most suitable mode of transport. I view this every time when I meet foreign students and friends in the Netherlands who also start to live and love the Dutch cycling lifestyle. From my cycling experience, while living on the Uithof and cycling from my small home-town to Breda, I faced long, dull never-ending roads which seemed to last forever. This nowadays resulted in the fact that I often take a longer but more exciting route to go somewhere and made me think of travel (time) experience.

When I started writing this thesis I had a totally different idea in mind, since in the first weeks I expected to work together with NHTV using a cycling simulator to do my research. The moment this turned out to be less advanced than expected and not in line with my study goals I needed to make a decision, to adapt my research idea or to use another form of research. I'm glad I already got stuck in the idea and felt inspired to develop a new experimental research design and use video research to get the results I wanted. This challenging way of research which I came up with myself motivated me to keep my research going. Thanks to my thesis supervisor Dick Ettema who supported my idea. He gave great advice, adequate feedback and left enough space to figure things out by myself.

For making this project happen I'm thankful to even more people, all the respondents in the research for filling in the survey and the people who helped finding respondents like Arie-Willem who arranged two classes at the MBO Utrecht. I'm glad I was able to borrow the Go Pro camera's from my friends Philo and Rogier, since without these camera's there would not have been any research at all.

For the past few weeks maybe months even, I've locked myself in 'geolandschap' at Utrecht University while trying to finish this thesis. As summer came closer this became harder. That's why I've been really glad to have my friends Fabian, Lou and Mette bearing with me and making this master study a fantastic year. Lastly I'm thankful to Sanne with whom I collected and shared the data for this study, and who backed up my idea for video research. It was nice to be able to discuss the subject extensively and inspire each other with new ideas. I really hope we both wrote a great master thesis.

Meike Schutte
Utrecht, 08-07-2015

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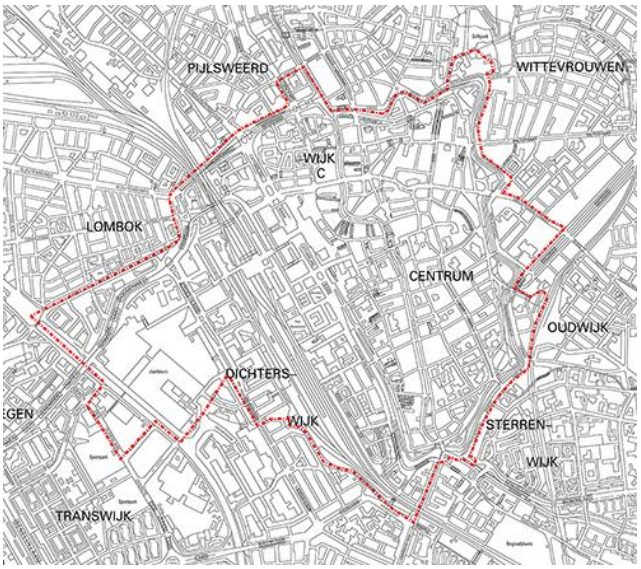
1. Introduction

Cycling is a trending topic, and has become more interesting for Dutch society. For instance there's a declining popularity of car use amongst young people (Volkskrant, 2012). This could be related to a change in attitude amongst young people as well as the fact that there are less distant movements for the young due to urbanization and modern ICT (Jorritsma et al. 2013). Next to this sustainability of transport is an important trend. Multiple European cities want to have a car-free inner-city zone, for instance the municipality of Utrecht. The most common reason for car-free cities tends to be the improvement of air-quality and the banishing of pollution. Since 01-01-2015 Utrecht has already banned heavily polluting cars and trucks from its inner-city (Figure 1.1), furthermore the municipality tries to improve cycling circumstances by adding more cycling lanes and more parking services for cycling (Gemeente Utrecht, 2015).

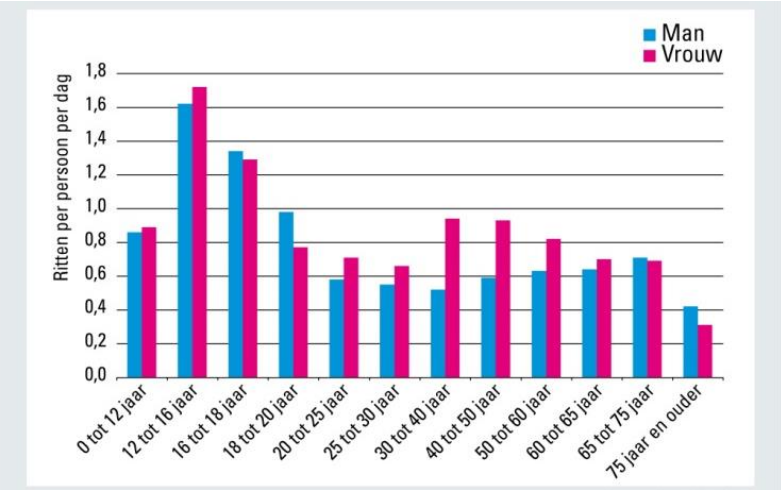
Figure 1.1: Milieu zone Utrecht (Source: Gemeente Utrecht, 2015)



Despite the popularity of cycling in the Netherlands, Dutch scientists never structurally had much interest in cycling , since it is a daily activity. According to Marco te Brömmelstroet this is also visible in the fact that the most important book on cycling in the Netherlands has been written by an American (UvA, 2015). However according to Olde Kalter (2007) over the past years cycling has been a trending topic, for society and for the individual. He adds that cycling presents a number of interesting advantages over other modes of transport. For instance, individuals benefit from the fact that cycling is a healthy and cheap form of transport. Moreover, in urban areas, cycling sometimes proves to be faster than other transport modes and allows cyclists to avoid traffic jams. Recent literature discusses this advantage by stating the bicycle (in Dutch cities) is more effective, due to dead-end roads for cars and possibilities for short cuts. For society, the advantages of cycling include environmental sustainability (no direct emissions of pollutants, CO2 or noise), cheap infrastructure requirements and improvements in public health (Olde Kalter, 2007). A lot of gain can be realized from increasing the share of bicycle commuters, which is why policy-makers in numerous countries show an increasing interest in encouraging cycling (Heinen et al., 2010). Right now in the Netherlands approximately 70% of the trips is shorter than 7,5 km and 50% of the car rides is 7,5 km or shorter (Fietsersbond, 2007). This offers a window of opportunities to replace these car rides with cycling, since in urban context cycling over short distances can be more efficient.

Youth between 16 and 26 is an interesting group when it comes to promoting cycling. Figure 1.2 shows that after the age of 16 the number of bicycle rides a day per person declines. In the age group from 18 until 30 there is an opportunity to try and stop the decline in bicycle use. Health is another extra important factor for the youth, since research has shown that young people tend to be engaged in less physical activity, which influences their wellbeing. Obesity is a bigger problem amongst youth than it is with adults (Grow et. Al. 2008).

Figure 1.2: Average number of bicycle rides a day related to age (Source: Fietsersbond, 2007)



In the Netherlands much has already been done to improve cycling conditions and facilities, it still is a point of action for governments and different organizations. However: *"Despite the fact that cycling is an option for many commuters (e.g. those who only have to travel short distances) and also brings a number of benefits, a considerable proportion of commuters choose to use other means of transport. Even in the Netherlands, which has a bicycle-friendly infrastructure and where cycling has a positive image, many people choose not to cycle in situations when cycling would be a highly appropriate transport mode"* (Heinen et al, 2010). From this quote it becomes clear that even with a bicycle friendly infrastructure and a positive view on cycling, it doesn't necessarily mean that people rationally choose to use their bicycle, despite of the many advantages like health, cheap transport and environmental sustainability. There are other influences on mobility choices as well. A lot of research is focused on facilitating cycling based on supply side, for instance by provision of new cycling lanes and parking opportunities by (Dutch) government), there is less focus on the cycling experience and how this can influence cycling propensity. In this research the focus is, trying to add to the creation of a healthier less congested and sustainable city by looking at these different influences on the cycling experience and the perceived travel time.

1.1 Societal relevance

Academics suggest that there is a lot of gain for society in stimulating cycling, since there is possible gain in health issues, traffic issues and sustainability issues (Hendriksen & van Gijlswijk, 2010; Diez Rouz & Mair, 2010; Olde Kalter, 2007; Hilbers, 2008). Health issues are especially important for the youth since this is a group that has a lot of obesity problems (Grow et al, 2008). Governments right now are focused on improving air quality in cities and making their inhabitants healthier (Gemeente Utrecht, 2015; European Commission, 2004). It is scientifically proven that the built environment is influencing cycling. One of the other aspects of the influences on cycling is aesthetics and experience. This research adds to this by trying to find interesting ways to make cycling more attractive in focusing on the experience of the cyclist.

1.2 Scientific relevance

Spatial planning of a neighbourhood can influence behaviour by at the one hand stimulating and obligating to certain behaviour and on the other hand by discouraging behaviour (Kaczynski and Henderson, 2007). In the Netherlands a network of cycling highways, where people do not get in touch with much other traffic and with broad cycling lanes is being designed, but still people tend to choose other routes. Much more is of influence on which routes people choose and their decision to go by bicycle than how fast they can get from A to B (Urbantrajectories, 2013). Much can be gained in looking into factors influencing route choice of cyclists.

Heinen (2009) adds that the experience is important because it influences perceptions of distance and time, these perceptions are important components of the cycling experience. Distance is especially important for cycling since increasing distance does not only cause longer travel time but also an (non-linear) increase in effort. In this way an attractive route can help to encourage cycling since it reduces the experienced effort (Heinen, 2009). This is why this research focuses on the cycling experience, and mainly the experience of the physical environment. To find out what Dutch youth between 16 and 26 believe to be important in their cycling environment and experience. Changing a cycling environment while enhancing the cycling experience can help stimulate cycling. This research uses a new experimental way of research to have a quantitative way of researching the experience by using video images. Respondents all watch the same video's and rate different aspects of the environment shown in the video, to measure how they experience this environment and what aspects of the environment the respondents deem most important for their overall experience.

1.3 Research questions

From what is stated above the following research question are designed.

To what extend does (the attractiveness of) the physical environment influence the urban cycling experience of youth studying in Utrecht?

This question will be answered using three sub questions:

- ***Which physical aspects influence the cycling experience of youth studying in Utrecht and what influence do they have?***
- ***To what extent does the attractiveness of the physical environment influence the travel time experience of youth studying in Utrecht?***
- ***To what extent do the attractiveness of the physical environment and the travel time experience improve the cycling experience of youth studying in Utrecht?***

1.4 Structure

In the theoretical framework different aspects of these central questions are elaborated on. First chapter 2.1 puts more focus on the benefits of cycling for society. Chapter 2.2. puts more focus on the determinants of cycling and mobility behaviour to explain these different influences. The importance of looking at routes from the users perspective (the experience) is central in this research, this view is in line with the 'new mobilities paradigm', in this scientific view the movement and the experience of this movement is central (Duppen, v., 2012). This is explained in chapter 2.3 in which paragraph 2.3.3 focuses on experienced time.

Research on the physical environment has mostly focused on functional aspects; safety and comfort. However attractiveness of routes is also important when it comes to influencing the cycling experience. Researching current literature shows that not a lot of research has been done on this subject and not all outcomes are clear (Heinen, 2009). Chapter 2.4 shows how the physical environment has been researched up to now and what influences have been pointed out to play a role. Lastly Chapter 2.5 shows the conceptual model based on the theoretical framework, pointing out factors from the physical environment in a schema as well as introduces the hypotheses.

In chapter 3 the methodology is explained this chapter shows that research on the cycling experience has been done in different quantitative and qualitative ways, trying to measure attractiveness of the physical environment in combination with for instance cycling attitudes. With developing a new method, using 'cycle-along movies' all the respondents view the same videos from the cyclist perspective. They are required to fill in the same questionnaire about their experience of the route. This way every respondent has the same experience and this experience of the surroundings can be systematically tested. This chapter displays which scenarios are established (3.3), what the surveys entail(3.4) and how the respondents are recruited and questioned (3.2).

Chapter 4 shows what respondents are in the sample, it gives a first analysis of the collected data and results and possible influences that the sample can have on the outcomes of the research. Chapter 5 shows the analysis based on the hypothesis posed in chapter 2. This chapter is divided in three parts based on answering the three sub questions. In chapter 6 the final conclusions in answering the research questions are given followed by some discussion and recommendations in chapter 7.

2. Theoretical Framework

This chapter describes the different theories on cycling. At first it will give an overview of the advantages of cycling, and explain why stimulating cycling is important, in paragraph 2.1 is described that cycling can have a good impact on health as well as be a solution to environmental and congestion problems. Then paragraph 2.2 will explain what the determinants of cycling can be, different literature explored what factors can stimulate cycling behaviour. This literature has been divided in individual, cultural and social factors as well as environmental and policy related variables. From this paragraph becomes clear that these factors all influence the cycling experience, which in its turn influences cycling behaviour as well cycling decisions. The cycling experience is central in this research and can be viewed in different ways, as is described in paragraph 2.3. There is an embodied experience which contains different factors amongst which a visual experience. Another factor that mutually influences the cycling experience is the perceived proximity/ experienced time. The way in which this relates to the experience of cycling is described at the end of paragraph 2.3. The (visual) cycling experience is impacted by the physical environment. Different factors from the environment are identified in paragraph 2.4. The division between the functional aspects and the aesthetic aspects is presented in the conceptual model in paragraph 2.5, this paragraph explains how this model emanated from the theory.

2.1 Advantages of Cycling

In 2000 the European commission came with a report on the benefits on cycling, calling it: 'the way ahead for towns and cities' naming the advantages cycling can offer for cities when they promote cycling they gave a list of presumed or proven advantages to be gained from cycling dividing them in various kinds:

"• economic benefits (such as a drop in the share of the household budget devoted to the car, reduction of working hours lost in traffic jams, reduction of health costs thanks to the effects of regular exercise);
• political advantages (such as a reduction in dependence on energy, saving non-renewable resources);
• social advances (such as the democratisation of mobility, greater autonomy and accessibility of all facilities to both young and elderly people);
• ecological impacts (with a distinction between local, short-term effects — notion of the environment — and non-localis"

In this chapter the advantages are divided and discussed within three categories, firstly health benefits, second sustainability benefits and congestion benefits.

2.1.1 Health

Cycling is a very healthy form of physical activity, in 2010 TNO published a report on the benefits on cycling named; 'Fietsen is groen, gezond en voordelig' (cycling is green healthy and cheap). In this report they named 10 reasons why cycling is a really good transport option. Four points are based on health namely: '1. Cycling increases fitness 2. cycling keeps you at a correct weight 3. Regular cycling makes you feel good 4. cycling minimizes your chances to become sick and lets you live longer'. Moreover points related to sustainability like improves air quality in the direct environment are related to health issues (Hendriksen & van Gijlswijk, 2010).

Positive effects of physical activity

Health issues in the Netherlands keep on rising and obesity levels appear to be at their peak, since they have been rising in the past 30 years. The number of overweight people has been rising from 33% in 1981 to 48% in 2011 (Nationaal Kompas Volksgezondheid, 2014). Being overweight can lead to a lot of other health problems like diabetes and heart diseases (Kaczynski and Henderson, 2007). Health is an extra important factor for youth, since multiple research has shown that young people tend to be involved in less physical activity, influencing their wellbeing (Grow et. Al. 2008). Dijst (2013) notes that there are different reasons why people move less time a day, one reason lies in spatial planning. Since bigger distances are more often travelled by less-active modes of transport (Dijst,2013). Sometimes people don't physically have to move but can use technology to cover a distance.

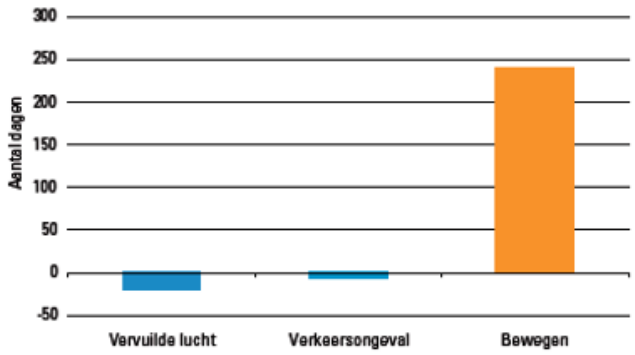
The influences from being overweight and physically inactive can result in higher healthcare costs for the government, which reflect on healthcare costs for society. The government is responding to this in an individual context, but it is also important to look at it from an urban context. Since a neighbourhood and facilities can additionally indirectly impact public health (Diez Rouz & Mair, 2010). This is described by Pikora et. Al. (2003) as well, who notice that the focus of physical activity interventions and research has moved away from vigorous exercise to moderate-intensity activities. This can be found in recreational cycling and in transport-related cycling (Pikora et al., 2003; Moudon et al., 2005; Hilbers, 2008). Authors notice that walking and cycling are more sustainable and effective of being active than sports, for the currently inactive, and more cost effective than structured and highly vigorous activities (Hilbers, 2008; Moudon et al. 2005).

A healthy environment

Cycling helps prevent intoxication of air quality and research shows that car-users breath in more intoxicated air, however cyclists tend to inhale fumes deeper in their lungs so more toxins can stick (Hendriksen & Gijlswijk, 2010). De fietsersbond (2007) shows the effects on lifespan of cyclists. Breathing in intoxicated air and traffic risks do have a negative impact on life expectancy in days. However exercise from cycling has much more positive effect on life expectancy in days compared to these negative effects (figure 2.1).

Next to this car traffic is the major source of noise in town, noise impacts both mental and physical health on the account of the disturbance it causes to sleep (European commission, 2000).

Figure 2.1.1 Impacts of Cycling on life expectancy in days. Pollution, Accidents and Movement



Source: Fietsersbond, 2007

It is obvious that physical activity enhances personal and public health, and stimulating this physical activity has been high on the agenda for the Dutch government. More and more this happens on the neighbourhood level, since literature shows that the direct physical environment has an important role in physical activity (Bakker et al., 2011). Spatial planning of a neighbourhood can influence behaviour by at the one hand stimulating and obligating to certain behaviour and on the other hand by discouraging behaviour (Kaczynski and Henderson, 2007). These aspects of the environment stimulating physical activity are discussed in the next paragraph.

2.1.2 Sustainability and congestion

In different studies about cycling and in city planning or environmental studies is shown that cars are partly responsible for the misuse of urban space, consume enormous resources and are a burden on the environment. Already in the 60's Jane Jacobs recognized the problems of urban design promoting car use and protested plans to build highways through cities. Pollution constitutes a threat to our historic heritage but most of all is a health hazard through both atmospheric pollution and noise. Besides this it has high human and economic costs when it comes to road accidents, and the economic costs of traffic jams remains at all-time high (Figure 2.1.2.1).

Cutting down car rides would improve the environment. Hendriksen & Gijlswijk (2010) say 300-900 thousand nitrogen oxides, 20-60 thousand particulate matter and 100-300 thousand of sulphur dioxide could be diminished when every commute under 7,5 kilometer done by car would be replaced by cycling. That's about 135-420 thousand kilo of Co2 a year (Hendriksen & Gijlswijk, 2010). Pollution is worse in short urban movements , the car isn't completely warmed up and there's a lot of breaking and accelerating. In the city fumes are directly released in a place where many people live and work (Olde Kalter, 2007).

Figure 2.1.2.1: Effects of different transport modes

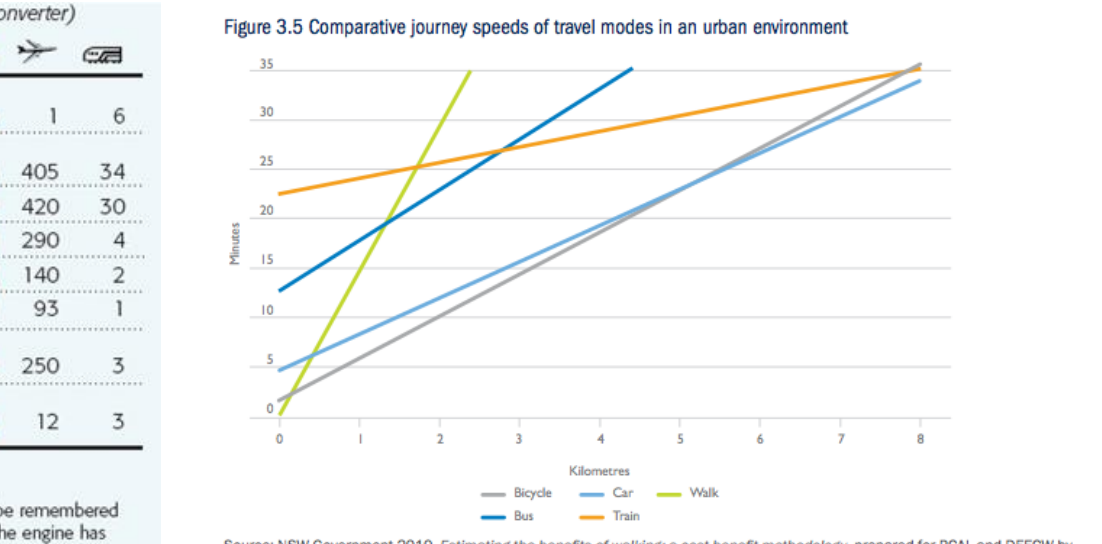
Base = 100 (private car without catalytic converter)

Space consumption	**100**	100	10	8	1	6
Primary energy consumption	**100**	100	30	0	405	34
CO_2	**100**	100	29	0	420	30
Nitrogen oxides	**100**	15	9	0	290	4
Hydrocarbons	**100**	15	8	0	140	2
CO	**100**	15	2	0	93	1
Total atmospheric pollution	**100**	15	9	0	250	3
Risk of accidents	**100**	100	9	2	12	3

* = **Car plus catalytic converter** It should be remembered that the catalytic converter is only effective when the engine has warmed up. For short distances undertaken in towns, there is no real anti-pollution benefit.

Source: UPI Report, Heidelberg, 1989, quoted by the German Ministry for Transport.

Figure 2.1.2.2: Comparative journey speeds of travel modes in an urban environment



Source: NSW Government 2010, *Estimating the benefits of walking: a cost benefit methodology*, prepared for PCAL and DEECW by PwC. Chart appears in numerous other sources citing: European Commission 1999, *Cycling: the way ahead for towns and cities*, p 11.

Source: European commission,

The report moreover shows that space consumption of a bicycle is very low and it scores best in all other categories. Like accident risk and the earlier explained pollution issues, however these risks off course depend on the context of different countries (figure 2.1.2.1). This while cycling can improve these conditions drastically, Figure 2.1.2.2 based on the report of the European commission (2000) shows that within a city cycling is often as fast as a car when travelling from door to door, so it can be an improvement for the economic costs as well as all the other risks involved in car traffic.

Nowadays technical improvements (like an electric bike) have made modern bicycles both efficient and convenient to use. They have no pollution, are silent, economical and accessible to all family members but most of all they are faster than cars over short urban distances up to 5 km and even more when there are traffic jams. Replacing these rides by cycling rides could make trips more efficient as well as help to cut down urban traffic jams and their pollution.

2.2 Cycling determinants and behaviour

Despite all the advantages of cycling not everyone uses their bicycle to cover short distances. Different research has identified main determinants of bicycle use. They can be divided in four categories, namely: Individual factors, social and cultural factors, environmental variables and policy related variables (Vanderbulcke et al, 2008).

2.2.1 Individual factors

Differences in who cycle and who don't can partially be related to socio demographic characteristics. For instance the research of Moudon et al. (2005) based in the US shows that cycling is dependent on age and gender, it appears to be more popular among male and younger adults. In the US a national survey reveals that "*about 27% of adults aged 16 or older rode a bicycle at least once in the past 30 days in the summer. More males (34%) report cycling than females (21%). The youngest age category of 16–24 years reports the highest rate of cycling (39%), while the oldest age category of 65 or older reports the lowest rate of cycling at 9% (Bureau of Transportation Statistics, 2004)"* (Moudon et al., 2005). This too became clear in the introduction in which research of de Fietsersbond (2007) shows that young people in the Netherlands tend to cycle more often than middle aged and older people. In the Netherlands bicycle use declines after the age of 18, when people are able to get their driving license and/or a student travel card. People tend to use these options when they are available to them (Olde Kalter, 2007).

De Fietsersbond (2007) shows that women in most age categories cycle more than men. This is in line with other Dutch research from Harms et al. (2007) which says that women are more often convinced that public transport and the bicycle are suitable forms of transport than man and that women more often associate cycling with low cost, being in time, being fast and being independent.

The car is rated as the most popular amongst younger people (aged 18-24) and the bicycle and public transport mostly by older people (Harms et al, 2007). This is in line with the data of the Fietsersbond (2007). Cycling is most popular with 35 to 55 year olds and 75+ tend to dislike the bicycle. People who are already physically active are more inclined to go cycling (Moudon et al, 2005).The research Moudon et al. (2005) did in the US differs from the Dutch figures, multiple research has shown that the Netherlands as well as countries like Denmark and Germany are precursors when it comes to cycling and cycling circumstances. This can lead to different cycling attitudes and cycling cultures, these are discussed next.

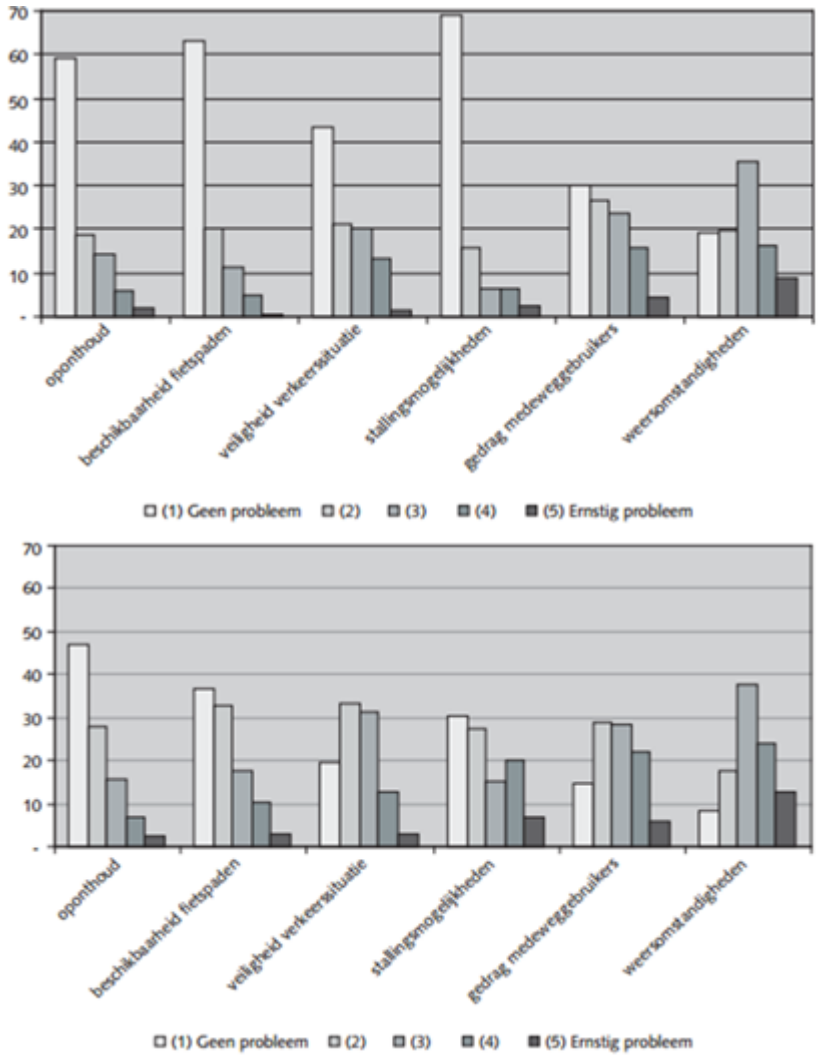
Next to age and gender income and level of education are factors influencing cycling behaviour, however there are contrary results. On the one hand a rise in income results in less bicycle rides (Fietsberaad, 2007; Heinen, 2011), but cycling is regarded more optimistic by highly educated (Scheepers et al., 2013). This can be due to different effects of income and education (Heinen, 2011). For instance people with a higher income have more chances of owning a car, and owning a car has a negative influence on bicycle use. Moreover work influences bicycle use, for instance the distance to work, people who work tend to travel most kilometres a day making the bicycle a less attractive means of transport (Fietsberaad, 2007). Household situation is related to income; students, the unemployed, and people without kids cycle more often than other groups (Heinen, 2011). Furthermore status and cultural backgrounds are of influence, highly educated are more often more interested in health and physical activity which is positively influenced by bicycle use. It seems that people with high income tend to use the bicycle because they want to and people with low income because they have to. This impacts the cycling experience and the attitude towards cycling (Scheepers et al, 2013).

2.2.2 Different motives

When it comes to cycling there are different circumstances in which people decide to go cycling or choose another form of transport. There is a big difference in commuting and recreational cycling, between mobility with limited freedom of choice and optional movements (Harms et al., 2007). A lot of research on cycling attitudes and propensity to go cycling focused on cycling for commuting. Commuters make long-term and short-term decisions (daily choices) to decide which form of transport they use. Commuter cycling is often on a daily basis and somewhat out of necessity, it is often repetitive and as efficient as possible. This repetition often results in refinement of tactics, which could make the cyclist feel more secure on the bike, and less sensitive to their direct surroundings (Duppen and Spierings, 2013).

These differences are noted in the report of Harms et al. (2007) who look at differences in experienced problems between recreational cycling and commuting. When it comes to cycling weather conditions are often named as a problem, this is especially the case for leisure time cycling (37%, 25% for commuters). In leisure time parking facilities for bicycles are a big annoyance while in commuter cycling this is most of the time not seen as a problem at all. Commuters in general view less problems in cycling (figure 2.2.2).

Figure 2.2.2: Experienced problems in commuter cycling (left) and leisure time cycling (right). Problems: Delays, availability cycling paths, traffic safety, parking availability, traffic behaviour, weather conditions. Rated on a scale from 1 (no problem) to 5 (serious problem)



Source: Harms et al, 2007

2.2.3 Social factors

Psychology is an important factor in the appreciation of modes of transport, emotions and feelings that are paired with using a certain form of transport (Harms et al., 2007). When looking at important reasons why people choose the bicycle over other forms of transport it is mostly about the fact that it is cheap, people can always be on time and make their own decisions, furthermore cycling offers peace and quiet. Annoyances and delays are much less associated with cycling than with other forms of transport (Harms et al., 2007).

An important model within social sciences and psychology is the 'theory of planned behaviour', which views attitude, social norms and behavioural control. Attitude can be considered as a sum of feelings and effects of behaviour which are weighted. Heinen (2011) views that the overall attitude towards the car is more positive than towards cycling. A more positive attitude usually inclines behaviour, in this case a more positive attitude on cycling will effectively mean more propensity to go cycling. Social norms are the social rules of a group and the degree to which someone wants to follow these rules, for cyclists the social norm usually is more positive than towards non-cyclists. Social norms and attitudes are influenced by someone's health and environmental convictions, for instance if someone really wants to be healthy he probably is more inclined to go cycling than someone who does not. Finally behavioural control, shows the amount of self-control on behaviour. For instance people who cycle more often experience less barriers to go cycling, from for instance weather conditions and physical requirements (Heinen, 2011).

Attitude

The first difference that can be found when looking at cycling attitudes is the difference between people who cycle often and people who don't/incidentally cycle. People who often cycle usually have a more positive view on cycling than people who don't, so the more the bicycle is used the more positive the attitude (Moudon et al., 2005; Heinen et al., 2011; Harms et al., 2007). The fact that cycling is a habit and someone is a regular cyclist has a positive influence on the frequency of cycling, which explains the difference in opinions of cyclists and non-cyclists.

Heinen et al. (2011) focused their research on commuters attitudes towards cycling benefits, and how this influences the decision on transport mode for commuting to work. They reveal three underlying attitudinal factors in cycling to work: awareness, direct trip-based benefits and safety. *"The decision to cycle is influenced by the factor ''direct trip-based benefit" at all distances, whereas the ''awareness" is influential only over long distances. The decision to cycle every day is again affected by the ''direct benefit" factor. The factors ''safety" and ''awareness" are important over shorter distances. Having a cycling habit increases the likelihood of cycling and a higher frequency of cycling."* With this they show that different attitudinal factors account for different parts of the decision making process.

Social norms

Change in attitude is of importance for cycling decisions like Tight and Givoni (2010) notice, in many countries not travelling by car is seen as being socially inferior. Changing this idea is not simply an individual attitude change there is an influence from society. Peer group pressure, has an enormous influence on attitudes as well as media imaging (Tight and Givoni, 2010).

In line with this Heinen et al. (2011) reveal that the perceived opinion of others mostly affect mode choice over short distances, which indicates that longer distance decisions are based on personal attitudes. She points out that in the Netherlands the improvement of facilities, at for instance work, are influencing cycling behaviour because they show attitudes and social perceptions. For example if your boss tends to promote cycling and helps to improve cycling facilities at work, it will be more

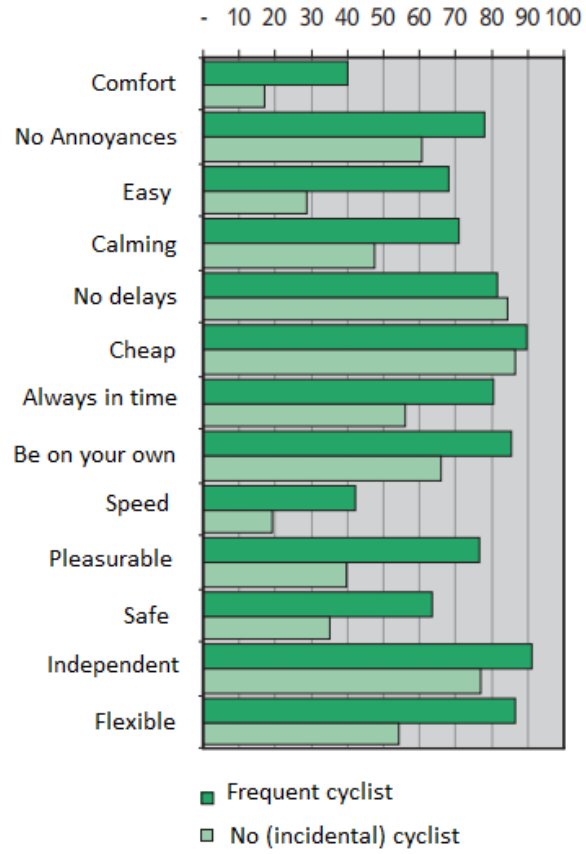
attractive to cycle. Since employees often feel that when they are on business trips, or wearing a suit, cycling isn't the best way to commute. If a boss invests in bicycle parking and cuts on car parking space this automatically sends a message to his staff. In this way environmental characteristics, containing aspects of the physical environment as well as the social environment, can influence chances of being physically active (Dhaeseleer, 2014). This shows a relationship between the different determinants of cycling; individual factors, socio-cultural factors, the physical environment as well as policy practices.

Duppen (2012) agrees with this by quoting Declerq (2012): *"Fietsen is zoveel meer dan een transportmiddel. In een metropool geeft het je hele leven een extra dimensie. Het is een lifestyle die je houding toont tegenover de wereld en tegenover jezelf"* (Declercq, 2012, p. 7; as quoted in Duppen, 2012). This Dutch quote shows that cycling is not just a form of transport, but it represents a lifestyle and your attitude, it shows who you are to others.

Behavioural control

Harms et al. (2007) write about how people experience their mobility, they view that different forms of transport can have different qualities, in letting people judge these qualities they learn about cycling attitudes. Figure 2.2.4. Shows that people who cycle often tend to view all aspects more positive, than people who don't (or incidentally) cycle. Differences are noticed in aspects like: safety, fun, ease, comfort and speed. People who cycle often experience different barriers than people who don't.

Figure 2.2.4: Judgement commuters aspects of cycling based on use



Source: Harms et al, 2007 (edited by the author)

2.2.4 Cycling culture

Pelzer (2011) notices that culture plays an important role in explaining mobility choices and behaviour, in practice policies see cycling as rational and try to make cycling as easy and attractive as other forms of mobility (Pelzer, 2011). Cycling is influenced by the way a person and his social environment view cycling, this is in line with the idea of social norms and cycling attitudes.

Each country has its own 'bicycle culture' which has both material and socially constructed properties of cycling. The two dimensions; physical environment and the socially constructed dimension (mobility culture) are according to Pelzer (2011) far from mutually exclusive, they interact in a complex way (Pelzer, 2011). Cycling attitudes in a county are shaped by the physical cycling environment, but the physical environment vice versa is influenced by the way a country views cycling. For instance the Netherlands has a positive cycling attitude and the physical environment is suitable to this cycling culture, and there is more investment and improvement in the environment because people cycle a lot and appreciate cycling. In the Netherlands associations even arose; like de Fietsersbond who stand up for cyclists rights and promote cycling and try to improve cycling safety (Fietsersbond, 2015).

Different cultures within the Netherlands have their own cycling culture as well. In most non-western countries cycling isn't viewed as a means of transport. Other cultures can view cycling as leisure time or see the bicycle as a toy or as having a negative impact on status. This could explain the difference with regard to people living in the Netherlands who have different cultural background (Fietsberaad, 2007). Cycling culture is highly intertwined with cycling attitude, which is discussed more in 2.2.4.

2.2.5. Environmental and policy related variables

The physical environment impacts the chances someone is physically active. Different health related studies research the impact of the neighbourhood on the probability someone chooses to go for a walk or cycle ride. This idea triggered theoretical models to distinguish environmental influences from behavioural determinants of physical activity (Lenthe et. al., 2005). During literature review it is noted that most literature related to the physical environment and the tendency to use physically active modes of transport is based on walking. In this paragraph (and a lot of literature) it is assumed that walking and cycling have the same triggers, however this research wants to extend research on cycling since it is faster and covers a bigger distance. Furthermore a lot of literature is not based in the Netherlands but context is really important in cycling behaviour. Europe has a lot higher density than the United states and the Netherlands has a much more extensive cycling infrastructure (Dhaeseleer, 2014). That's why most international research will be supplemented with Dutch research or questioned in the Dutch case.

The idea that neighbourhood characteristics are related to physical activity is initiated in the late eighties, and still recent research notices that spatial planning of a neighbourhood can influence behaviour by on the one hand stimulating and obligating to certain behaviour and on the other hand by discouraging behaviour (Kaczynski and Henderson, 2007; Lenthe et al. 2005). Many trips start or end at home which makes the neighbourhood a significant component (Dyck v. et al., 2012). Stimulating physical activity is on the agenda of the Dutch government, more and more this happens on the neighbourhood level, since literature shows that the direct physical environment has an important role in physical activity (Bakker et al., 2011).

Whether an environment is stimulating bicycle use can be measured by the 'bikeability index' (Scheepers et al, 2005) or the 'cyclability index' which measures the proximity and reachability of daily facilities, walking and cycling activities, infrastructure, parking facilities and perceived aesthetics (Van Dyck, et al, 2012; Scheepers et al, 2005). The mixing of functions in a neighbourhood is often viewed as a solution for less car use, in which density is important in the declining necessity of the car (v. Acker, 2010; Handy and Saelens, 2008; Cao et al 2009).

Boarnet and Crane (2001), argue that literature gives mixed views on whether high density, mixed use developments, more open circulation patterns, and pedestrian 'friendly' environments are all associated with less car travel. Since some studies show no influence of the physical environment on either individual or aggregate travel behaviour. However Handy and Saelens (2008) argue *"Previous reviews and newer studies document consistent positive relations between walking for transportation and density, distance to non-residential destinations, and land use mix; findings for route/network connectivity, parks and open space, and personal safety are more equivocal."*

Moudon et al. (2005) likewise refer to the bikability of environments, according to them much research focusses on a level of service and assessing safety based route-related variables, but these indexes remain insufficiently tested. They point to some studies taking in account factors like stress, comfort and satisfaction but a lot of questions regarding cycling decisions remain unanswered. Studies show that walking behaviour from people living in socioeconomically advantaged and disadvantaged neighbourhoods differs, suggesting that physical environments (neighbourhood) influence walking behaviour (Pikora et al., 2003). Van Lenthe et al. (2005) in their research view measured distance to facilities, perceived proximity to physical activity facilities, the number of places to be physical active as important determinants, but also see a positive relation between neighbourhood aesthetics and physical activity, as well as a relation with perceived safety (Lenthe et. al., 2005).

However a lot of researchers question the causality of the relation between the neighbourhoods built environment and cycling behaviour. Van Acker (2010) believes that people choose their living environment in accordance to their lifestyle. Handy et al. found in their study in California that attitudes do play an important role, but that there seems to be a causal relationship between how the neighbourhood is shaped and changes in travel behaviour (Handy et al, 2005, Cao et al. 2009). Correspondingly Moudon et al. (2005) point out that that the potential self-selection problem is debatable since in their research the majority of cyclist moved to their current locations for reasons not relevant to the bikability of their neighbourhood. Hilbers (2008) does find some evidence for self-selection in research in two areas in the Netherlands, but not enough to explain differences. So most research notes that there is a possible but limited self-selection effect.

Pikora et al. (2003) viewed that most studies that examine the relationship between the built environment and physical activity are focused on the availability and proximity of facilities, but some studies focus on limited features in the physical surroundings, and some on perceptions about how the environment influences patterns of physical activity. The physical surroundings and perceptions of these surroundings are central in this thesis.

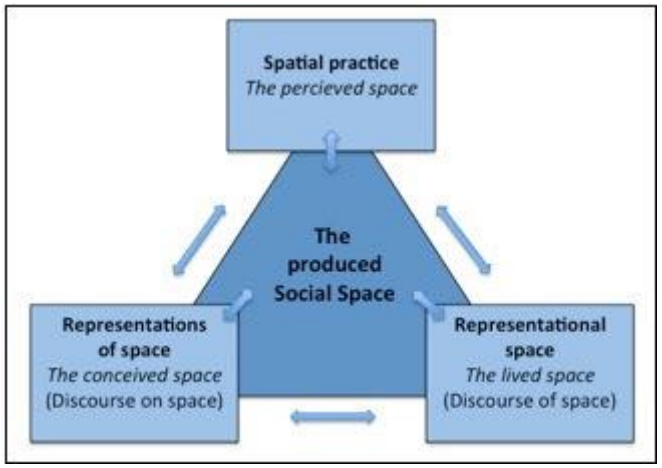
2.3 Experiencing the environment

For a long time scientific research has focused on push and pull factors of movement, a lack of focus has been on the movement itself. This changed with the 'new mobilities paradigm' based in research of Sheller and Urry (2006), integrating different social sciences by focusing on movements. Looking at movement as an experience not just the form of transport or a chosen route, mobility is complex existing from movement, meanings, politics and physical and embodied experiences (Duppen, v., 2012). The meaning of an environment and how this can be experienced is discovered in this paragraph.

2.3.1 Representations of space

The 'new mobilities paradigm' views cycling as more than a means of transportation. Pelzer (2010) in his article names three examples of representations of movement: *"For instance, in the Netherlands the bicycle was a tool of nation building in the century before the Second World War (Ebert, 2004), whereas it has become a symbolic transportation mode for the environmental movement in the UK (Horton, 2006) and a sign of resistance against capitalism and conservatism in the US (Furness, 2005)"* (p.1). These views perceive cycling as a social construct in which space is of less importance. Cresswell (2010) views three aspects of mobility: *'…the fact of physical movement—getting from one place to another; the representations of movement that give it shared meaning; and, finally, the experienced and embodied practice of movement. In practice these elements of mobility are unlikely to be easy to untangle. They are bound up with one another.'* (p. 19). The triggers of movement have been discussed before, now first representations of movement and space are discussed and then the experience of movement.

Figure 2.3.1: Triangle of Lefebvre (Source Velomobility Copenhagen 2015)



When doing research on cycling it is important to note that factual physical movement and meanings and representations bound to it, are all intertwined. This has been stated by Lefebvre (1991) who notices that the conceived space, the perceived space and the lived space are contested and all together dialectically produce space. In this view social processes and relations do not happen in an empty container of space, but space is constituted by social relations which in turn are constituted by space (Leary, 2009). Space thus is not only defined as static, but can be defined as a construct, made by interactions between people and objects (Duppen, 2011)

This idea notes that the conceived space isn't always in line with the lived space, this is where much critique on a planning perspective on cycling stems from. Like this translated quote from an Dutch article on cycling in Utrecht notices (Dutch quote see appendix): "*Cyclists have their own logics from practice. Beneath the square of the University library is a beautiful bicycle storage. However the street in front of the library (Drift) is covered with bicycles. A bicycle has to be closest to the destination as possible….. Also when the streets are busy, cyclists squeeze themselves between cars and cycle in front of them resulting in cars driving slowly…. Why would they cover an entire route in red tarmac and replace a bridge with a brand new expensive tunnel? That's just one route. Wilhelminapark, de Springweg, de Herenstraat, de Leidseweg de Voorstraat will all get cycling high-ways…. It's a major surgery... and an expression of planned thinking*" (Orthel, 2013).

The quote explains a situation in the city where the cyclists always choose their own routes, directions and rules. The cyclists adapt the rules to their own advantage move in-between cars, and implement cycling rules like parking right in front of their destination. The author questions whether it is necessary to improve the cycling lanes and overrule the existing authentic routes, or are these 'improvements' just made up by planners? The article Orthel (2013) criticizes planned thinking and argues that cyclists like their routes as they are since they're authentic. Planned thinking is in line with the conceived space in Lefebvre's triangle, however this quote notes that the lived space and the perceived space are very different from this conceived space. Plans to respond to current (traffic) issues don't relate to the current discourse of an experience society. This idea refers to the fact that a lot of research is based on practical matters more than cyclists experience. There is a gap between this practical research and the actual experience of cyclists during their trip.

2.3.2 Experience of movement

The previous quote makes it more logical to view the experience of cycling, this experience should define and influence decision making not defy decisions made. As Duppen and Spierings (2013) notice that when it comes to commuting not all cycling decisions made are purposive: "*There is more complexity to be found in daily commutes than only purposive intentions and the related aim to find efficient trajectories. Commutes often also have discursive characteristics and may be undertaken for conceptual reasons as well. A detour through a quiet and green environment, for instance, may very well be chosen with the purpose of avoiding chaotic situations and saving time. At the same time, it may be taken for reasons of "more conscious contemplation of the surroundings, rather than reacting to immediate challenges and threats on the road" (Jones, 2012) and even for getting to know the city better"* (Duppen and Spierings, 2013). Subjective aspects of mobility are often overlooked when it comes to traffic and transport research. Mostly this research focuses on factual behaviour and patterns, whilst experiences and perceptions can provide more insight in mobility (Harms et al., 2007) and thus cycling behaviour.

Commuter cycling is an everyday practice in which experience is sensed through seeing, hearing, smelling, tasting and feeling the city and it's features. This research is focused on the visual experience, in the use of video images. According to Degen et al (2008) there are three characteristics to reworking the visual experience. Firstly experiences are theorised as *performative*, meaning that experiences are generated through practice. Secondly experiences are *relational*; an experience is not only based in the moment it takes place but additionally is a relational experience. There is an ongoing remembering of other places and previous visits to the same place, these assimilate a person in the experienced place and makes reference to other places elsewhere (Degen et al., 2008; Duppen and Spierings, 2013). While someone is mobile constantly first impressions, comparisons and memories take place, it is almost impossible to have new impressions without relating these to previous experiences. This relational experience is important when looking at experienced routes, Spierings (2009) calls this the idea of 'multiple cities'.

Lastly *visuality is multimodal*, which means it is almost always influenced by other experiences (Degen et al., 2008). The senses are interconnected and interrelated, which means they influence each other, for instance hearing sounds influences the way you experience what you see (Duppen v., 2012). This is viewed in the research of Aldred & Jungnickel (2014) who view that cyclists influence their experience of cycling and the urban environment by listening to music from portable devices. "*The cyclists that we spoke to did not simply use audio mobile devices without thinking. For some, it provides the motivation to commute and exercise instead of taking the 'convenient' car or it relaxed them in stressful situations. For others, it operated as a mental health device to help separate home and work identities" (*Aldred & Jungnickel, 2014, p. 252). They view that commuter cycling has different meanings and experiences attached to it, causing different experiences of the urban environment.

This possibly explains attitude differences and experience differences between regular cyclists and non-cyclists (2.2.3), since they have a lot of experiences and memories with their daily commute. Performative and relational experiences show that memories collected during previous commutes are important for understanding present experiences. The formation of attitudes is in line with these experiences, since positive past experiences can create more positive attitudes.

The cities features can both be human (the social life) and nonhuman (built environment), while riding a bike the cyclist both experiences and reflects on these features of the environment (Duppen & Spierings, 2013). The nonhuman city features are called the physical environment in this research and is the focus of this research.

2.3.3 Perceived proximity and experienced time

Heinen et al. (2010) identify determinants for commuting by bicycle and view that predicting and influencing bicycle use has other foundations than the use of other motorized vehicles. Besides the posed advantages of cycling, transport by bicycle brings a number of difficulties; a greater physical effort, the difficulty of carrying loads, weather conditions and outside the urban area travelling more slowly than motorized vehicles. These factors limit the distance someone can travel by bicycle. The experienced time and effort are greater than those of car use, even though a bicycle in reality often is faster in an urban context.

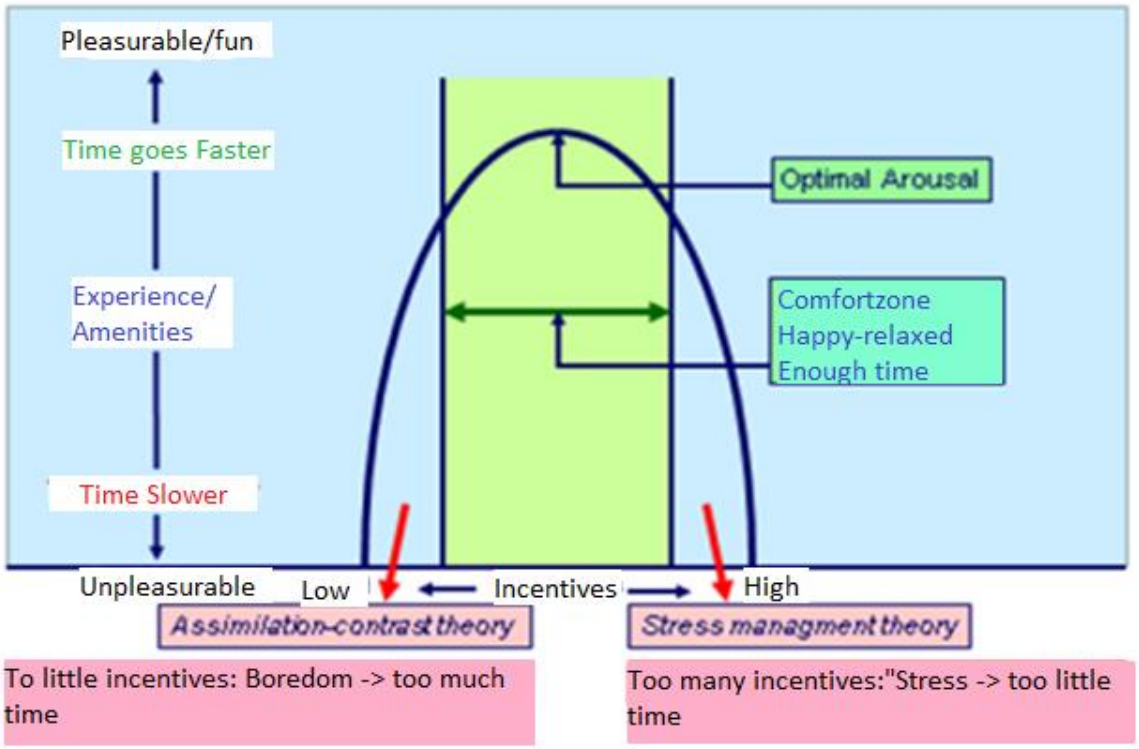
Effort is an important factor when it comes to cycling, that is why proximity plays a big role. With cycling an increase in distance also means an increase in travel time as well as a non-linear increase in effort (Heinen, 2009). Some research focuses on the fact that cycling is an attractive mode of transport for short distances and tries to improve routes for cycling as well as stimulate cycling for distances under 7,5 km. Heinen (2009) in her research views that a lot of factors play a role in whether someone decides to use a bicycle. The quality of cycling lanes as well as, stopping for traffic lights influence the experienced travel time. This is all part of the perceived proximity, this perceived proximity differs from objectively measured distance. As Moudon et al (2005) found in their research: "*Both perceived and objective environmental conditions contribute to the likelihood of cycling. Proximity to trails and the presence of agglomerations of offices, clinics/hospitals, and fast food restaurants, measured objectively, are significant environmental variables. Previously researched correlates of cycling, such as the presence of bicycle lanes, traffic speed and volume, slope, block size, and the presence of parks, are found insignificant when objectively measured. A non-linear relationship is found between the odds of cycling and the perception of traffic problems and automobile-oriented facilities moderately associated with the neighborhood environment.*"

Hagen et al. (2012) write that in the Netherlands planning and city infrastructure have mostly focused on shortening actual travel times, by designing fast cycling routes. In reality it has been proven that people don't actually have a true sense of time, time with high amenities is structurally estimated shorter than time with low amenities. The decision to choose a mode of transport is actually relying on the time we think a route lasts, not the time it actually takes. Reducing stress and more joyful routes are mostly experienced in new traffic improvements more than reduction of real time, that's why subjective experiences of time should be taken into account in traffic planning (Hagen et al., 2012). Travel time is more important for cycling than it is for other forms of transport, cycling time a minute is rated 3 times more tedious than travel time with other transport options (Heinen 2009).

Moreover effort can be experienced Heinen (2009) notices that an attractive environment can contribute to more cycling, an attractive route can stimulate extra effort when a decision is made to take this certain route because of its attractiveness, and effort is less noticed when a route is more attractive (Heinen, 2009). Spierings and van Duppen (2013) agree and observe that the experience of

the environment highly influences how people experience their bike ride. This is in line with theories about objective and subjective time experience, people can only estimate time, they can point out whether something takes a long time or not. When this idea is applied to mobility in the city, people experience boredom while cycling past boring monotone routes, this makes them experience the route as lengthier in time and distance. This is visualised in figure 2.3.3, in which Hagen et al. 2012 put the optimal arousal theory and the theory of time perception together in one figure, time goes faster when things are pleasant and a person is optimally aroused, with not too many incentives (Hagen et al., 2012).

Figure 2.3.3: Optimal arousal and time perception theory



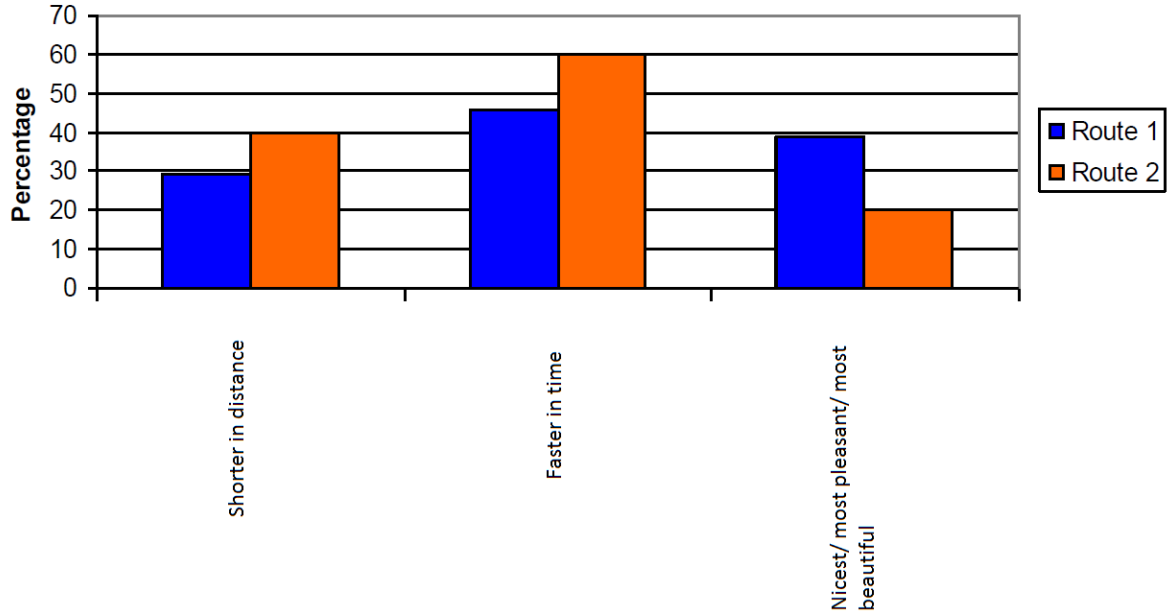
Source: Hagen et al. 2012 (edited/translated by the author)

Jacobs (2011) agrees with this idea and says that landscape preference research has in the past been based in arousal theory by Berlyne. He writes that landscape experiences are dependent on discourse since in a discourse ideas and meaning are conveyed between individuals, this is a cultural factor of shared meanings assigned to a landscape, and as said before personal factors like individual previous experiences (relational experiences) as well as differences in personality traits play a role in landscape perception.

According to Hagen et al. 2012 three dimensions influence the experience of an environment. The ambient elements, are usually unconsciously noticed except for evident ones (for instance when it's really cold or really noisy). The stimulation someone experiences from a long grey route is minimal, this makes the route uncomfortable. The second dimension is the design elements, these are more notable and can be seen in the aesthetic (which excite the senses) and functional elements (facilitating behaviour). Lastly there are social elements, what kind and how many people are in the environment, for instance an abandoned route can cause a 'creepy' feeling and a lot of chaos and traffic can cause stress both cases result in negative emotions which make the route feel longer.

These ideas show that how people feel about a route can influence the time they feel the route lasts. Since feelings of boredom or stress, and experiences with high or low amenities can influence someone's perception of time. That's why the experienced time can be viewed as a factor which influences the cycling experience as well as a tool to measure it. In their research Hagen et al (2012) perform a short experiment in Utrecht In which they asked cyclists to choose from two routes one is a nice 1.8 km route past the waterfront, the other a 1.6 km route past a busy road full of cars. They asked 35 people which route they would take, 85% would take the 1.8 km route and as a reason for their decision 60% name the fact that the route is faster, and even 40% names the fact that it's actually shorter. The research shows that people don't really have a clue how long a route lasts which makes travel time experience of importance to promotion of cycling strategies.

Figure 2.3.3.1: Route choice motivation



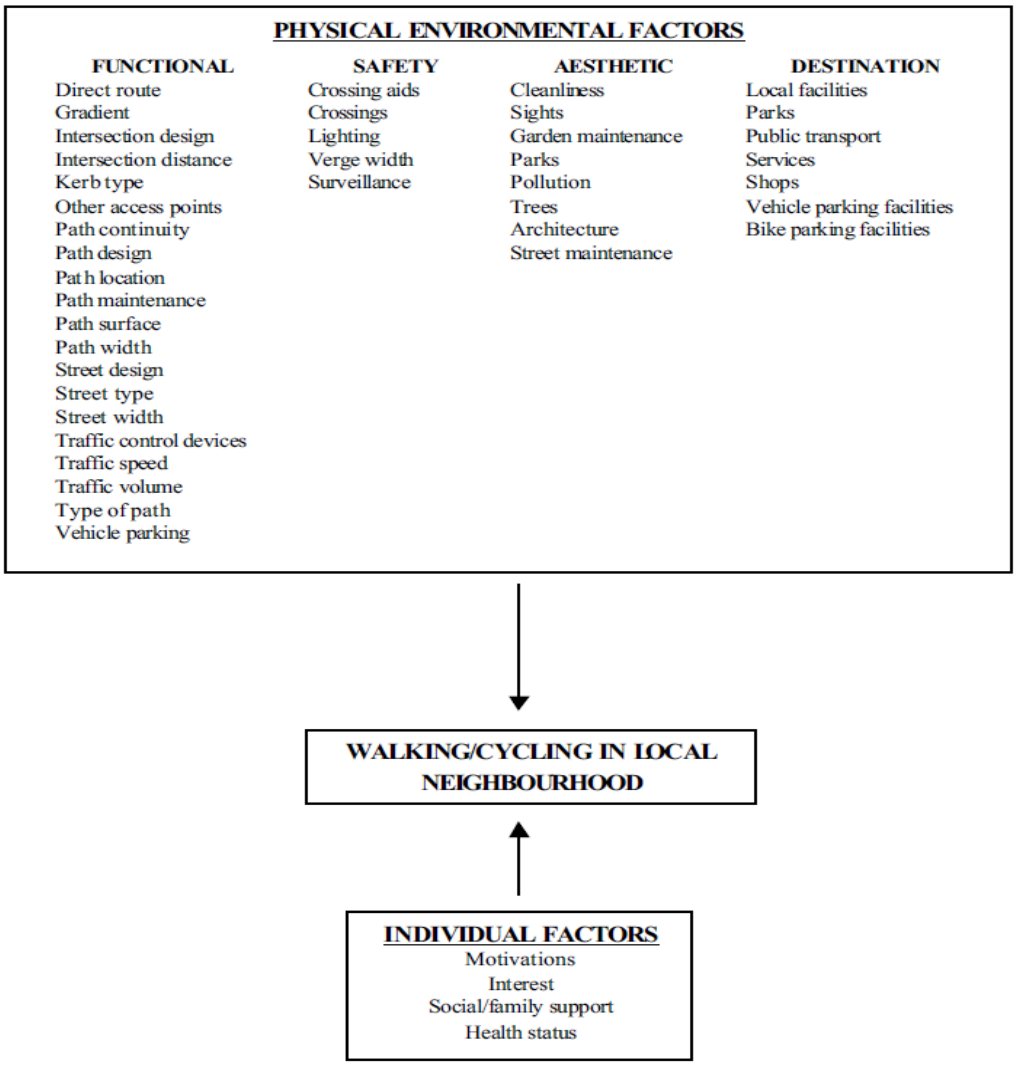
Source: Hagen et al. 2012 (translated/edited by the author)

These ideas can be applied to the urban transport system, for instance by leading the route past an alternating environment will make the route feel shorter (in distance and time) and with this shortened travel time experience the decision to go cycling can be enhanced (Hagen et al., 2012). These expectations are used in the route choice for the videos in the research. Some are expected to last longer for the viewer than others, in the next paragraph more physical elements are explored.

2.4 Physical environment

The experience of an environment is not determined by the physical environment but it is under the influence of the physical environment (Jacobs, 2006). Different research has tried to grasp the influence of the physical environment and specific environmental aspects. Usually this research is focused on functional aspects of cycling (Heinen 2009; 2011) as is noted in neighbourhood research, which is mostly focused on the built environment and transport behaviour. However it is still not clear what influence the built environment has (Heinen 2009; 2011) and which aspects are important. Pikora et al. (2003) in their research made a new schema to show the different aspects in the physical environment

Figure 2.4.1: Physical environmental factors according to Pikora et al. (Source: Pikora et al. 2003)



According to Pikora et al. (2003) the features that emerge as important across multiple studies include Functional aspects on route, safety (lighting, traffic) and convenience of nearby facilities (shops, schools) and aesthetics (parks, trees, shade). This schema is not complete but does show a short overview of some factors and categories. It shows that most factors are functional, safety related and about facilities at the destination. The functional and aesthetic aspects and their impact on behaviour have been discussed in 2.2.5, however these aspects can moreover have an influence on the cycling experience. This paragraph will first discuss functional aspects, then natural aspects and finally aesthetics.

2.4.1 Natural Aspects

In most transport literature it is not expected that the natural environment impacts transport mode choice, since this doesn't count for cars or public transport. However in cycling the natural environment does matter, since the cyclists interacts with these elements in open air (Stefansdottir, 2014).Existing research has mostly focused on impacts of weather, climate and height, these all have a direct impact on the cycling effort. A recreational motive can have different requirements than a transport motive, for instance when someone likes the view of hills for leisure it is still more effort for transport. However a regular cyclist is less easily stopped by the rain than someone who doesn't cycle often (Heinen, 2011). These natural elements are not easy to influence, however some can be influenced for instance: the attractiveness of the (natural) environment. Which is seen as a trigger to stimulate cycling (Pikora et al., 2003; Parkin et al., 2007). Attractiveness of the natural environment is mostly influenced by the presence or absence of; trees, parks gardens and natural views. They can positively impact the physical and mental wellbeing of people and enhance the cycling experience (Maas et al., 2008). This visual experience can be seen as the impact of aesthetics of the cycling experience.

2.4.2. Functional Aspects

Safety features

The built environment is important in choosing modes of transport and the chances someone is physically active. A lot of this has to do with proximity of facilities as well as the infrastructure and density. In a lot of research on cycling and the physical environment researchers view: distance, time, infrastructure and facilities, mostly these are influenced by objective and subjective traffic safety (Pikora et al, 2003; Heinen, 2011) as well as effort in cycling (Heinen, 2011). These factors are important since unsafe feelings and feelings of much effort can result in less cycling. Subjective traffic safety is related to the cycling experience and can be noticed in different ways. For instance when someone hasn't got much cycling experience and feels unsafe in the traffic. Subjective safety can be experienced in less safe situations like busy streets or crossroads, or cycling on a car road. Environmental aspects related to safety mostly regard infrastructure. For instance the road: a separate cycling lane or on-road cycling are different definable infrastructures for cycling. Preferences and feelings of safety strongly relate to personal factors like experience. According to Klobucar and Fricker (2007) the effect of cycling infrastructure on objective safety is less clear than on subjective safety, so the experience of safety is really important. Parking facilities can have effects on safety, for example the manoeuvre that has to be made can be conflicting with other road users (Heinen, 2011).

Infrastructure

An aspect that is related to infrastructure is the continuity of a route, which is mostly of influence on cycling for transport. It is important that the cycling route doesn't entail many barriers, delays and stops. On the one hand because of lost time and on the other because of the effort related to cycling (Heinen, 2011). Barriers like traffic lights can cause a lot of annoyances, making the perceived distance and experienced time last longer. Heinen (2011) notes that people cycle less in routes with a lot of traffic lights and stops, people even avoid these stops. However these stops do help safety and avoid stress and can make a route feel shorter hence continuity isn't the only important factor.

Another important factor related to effort is spatial planning, mostly when it comes to proximity for commuting. Distance is an important factor when it comes to traffic mode choice, because of the physical effort. A lot of cycling research and improvements for cycling are planning based, mostly on creating a physical environment to make cycling as easy and fast as possible. In the research of Moudon et al. (2005) they asked what environmental changes can encourage cycling, frequently mentioned are: more bike lanes and trails (mentioned by almost 49% of the respondents), good lighting at night (33%), and bicycle racks at destinations (31%). Often these physical improvements are made to improve cycling conditions. Studies show that provision of wide cycling lanes, presence

of on-street parking increased the perceived comfort of cyclists, in contrast greater traffic volume and speed decrease comfort levels (Pikora et al., 2003).

Heinen (2009) after her research in the Netherlands mentions that improving a cycling lane would only influence people who already have a positive attitude towards cycling and people that already cycle are stimulated to cycle more (Heinen, 2009). This is in line with Handy et al. (2005) who view that the built environment is more relegated to facilitating preferred behaviour, in this case creating environments that facilitate cycling and discourage driving would have limited effect on those who are not already motivated to cycle more and drive less. This is in line with the idea that perceptions on cycling and cycling experience play a bigger role than just improvements in infrastructure.

Density

Heinen (2009) views that higher density in the street patterns help distances become shorter, because of the opportunities of route choice and choosing the fastest route. High density usually helps distances become shorter. Which explains why people in the city centre more often use their bicycle. High density usually entails mixing of functions within the area in this case facilities are often closer and travelling times shorter. Higher density and mixing of functions has been found to lead to more cycling, in the schema of Pikora et al (2003) these are viewed as destination factors but in this thesis they also matter for the cycling experience, which will be explained in the aesthetics part.

Duppen and Spierings (2013) found that governments writing new policies for safer, more sociable and less environmentally damaging environments focus on encouraging walking and cycling practices. Yet, 'simplistic' labels of environmental responsibility and healthy lifestyle don't really represent the 'intense and personal experience' of commuter cycling. That's why they believe it is important to understand what it means to cycle between home and work on a daily basis and not only focus on the functionality of the built environment, *"the built environment needs to be designed in a way which enables walking and cycling to occur in an easy manner without obvious barriers to impede travel. Such functionality, which can generally be achieved by engineering approaches, includes such factors as: coherent 'door to door' routes for walkers and cyclists which are easy to navigate; safe footpaths, cycle ways and road crossing points; and easy integration with public transport".* Functionality has been central in urban planning for years especially functionality when it comes to car travel. (Timms & Tight, 2010). However there is more to the physical environment than just functional aspects, new models define broader ideas of the physical environment.

2.4.3 Visual Aspects

Handy et al. (2005) found that changes in the built environment have effects on changes in walking behaviour. They however viewed that the most important variable in predicting a change in walking behaviour is a change in attractiveness. Hillbers (2008) says *"..all else equal, people walk more if they move to a neighbourhood with a more attractive appearance, higher level of upkeep, more variety in housing styles, and/or more big street trees than they had in their previous neighbourhood. Other changes in the built environment also predict an increase in walking, such as better alternatives to driving (in the form of sidewalks, and public transport service), better safety (like low level of traffic, and good street lighting), and more sociability among neighbours"* (Hilbers, 2008). This is in relation with the experience of time and proximity on the route, since a nicer environment is likely to cause less experienced effort and a reduced perceived distance (2.3.3).

Already in the 60's in her book death and life of great American cities Jane Jacobs viewed that mixed use makes a city lively and interesting *"Dull, inert cities, it is true, do contain the seeds of their own destruction and little else. But lively, diverse, intense cities contain the seeds of their own regeneration, with energy enough to carry over for problems and needs outside themselves"* (Jacobs,

1961). The idea that a lively city would save a city of decay came to life with public life studies (Gehl & Svarre, 2013). Jacobs (1961) noted that attractive greenery and mixed usage attracts people to use an area, factors like trees, parks, different views and building designs, litter free well maintained areas and short blocks that allow people to change direction and change their view frequently are important for a city (Jacobs, 1961). Her book 'The Death and Life of Great American Cities' published in 1961 was a manifesto that urban design should look beyond a practical and economic point of view. In his book: 'Life between buildings' Jan Gehl investigates how we can design the outdoor environment to encourage it's use, so that cities and residential area's become more vibrant and lively. Through 'performative' research he found that in Europe, Medieval towns work better than towns planned in the Renaissance (according to aesthetic principles) and Modern planned towns (functionalist). He believed that the medieval towns have evolved and continually adjusted and adapted their physical environments to functions (Gehl & Svarre, 2013).

Pikora et al. (2003) found that since the 80's appealing features of the environment have been reviewed. They include trees, parks, open space and landscaping; the availability of shade; the presence of benches and resting places; quiet streets and footpaths; historic neighbourhoods and buildings and safety from crime. An attractive local area is important for pleasant walking/cycling, the level of satisfactions with a walking and cycling environment is determined by both a physical and visual experience (Pikora et al. 2003). So the visual aspect is important during cycling, however the cyclists need to have the opportunity to watch the surroundings. Complexity and disturbing factors like in traffic can influence what a cyclist sees. Since these situations can be disruptive to someone's attention (as viewed in 2.3.3) (Spinney, 2007). When people experience a route more often it can become less complex since the cyclist experience the route as a whole, habit influences the aesthetic experience (Duppen & Spierings, 2013; Stefansdottir, 2014).

Different research found that aesthetics of the environment as well as (perceived) safety are important factors in physical activity in connection to the neighbourhood. For instance Bal et al. (2001) make an aesthetics score based on local attractiveness and found a relationship between aesthetics and walking exercise in Australia, but on the other hand van Dyck et al. (2012) view that perceived aesthetics show less consistent findings. Other studies like van Lenthe et al. (2005) put all these reviews together and see that: *"Some studies have reported a positive association between the aesthetics of the neighbourhood and physical activity (Ball et al., 2001; Brownson et al., 2001; Corti, Donovan, & Holman, 1997; Takano, Nakamura, & Watanabe, 2002). There is also evidence that increased perceived safety is related to a decreased likelihood of being physically active (Booth et al., 2000; Craig, Brownson, Cragg, & Dunn, 2002;Eyler et al., 1998; King, Castro, Eyler, Sallis, & Brownson, 2000; Weinstein, Feigley, Pullen, Mann, & Redman, 1999).* All these authors view that both functional aspects, the way these are perceived and the attractiveness of the environment play a role in the cycling decision. However these factors are also important for the cycling experience.

Aesthetics is one of the most important factors in building a city, and the concept makes it possible to understand the values people attach to a physical space. Physical changes won't directly change cycling habit, but it is important to keep in mind in designing cycling environments (Stefansdottir, 2014). This is in line with believes that western society has been typified by scientists and philosophers as an experience society. Social traditions have less influence on the lives of individuals and people are able to make their own decision based on their own experiences. They are able to look for interesting experiences and this influences the way we view our environment. Aesthetics in this way become more important, and even lead to a landscape experience society (Jacobs, 2006). Some researchers have already noticed the importance of experiencing the physical environment (Timms & Tight, 2010; Forsyth & Krizek, 2011 and Fleming, 2012), however the true aspects of experience are not yet fixed. Mostly aesthetic research is focused on improving mental wellbeing. Some studies have used vague terms to describe a nice environment, but no hard aspects are defined yet.

Heinen (2011) views that the one of the most positive impacts of cycling is an attractive environment, however this had never really been statistically confirmed. Mostly individual factors are viewed as important, for cycling behaviour. That's why Handy et al. (2002) view that more research to these aesthetics is needed.

A lot of literature expects a relationship between aesthetics, the visual environment as a whole and the effect of more physical activity and expectations of less feelings of time and effort. However these relations remain quite unclear. Moreover definitions of the different visual aspects which are important in the visual environment are often vague or these aspects are hardly defined. That's why in the next paragraph this research will try to define these aspects before trying to find statistical evidence for their impact on the cycling experience and travel time experience.

2.5 Conclusion

From these ideas it becomes obvious that cycling has a lot of positive properties, thus stimulating cycling is an interesting thing to do. Up to now in stimulating cycling a lot of functional incentives have been used, for example by making cycling more attractive financially and physically. Still most people already have an attitude and habit when it comes to cycling and this partially defines their behaviour. Previous research shows that the experience of mobility is essential in choosing modes of transport and route choice. Experience can be viewed in different ways and is especially important for cycling since effort, the embodied experience and the environment are of more influence than with other forms of transport. This is also visible in theories about experienced travel time and perceived distance when it comes to cycling. The perceived effort can be influenced by adapting the physical environment for better travel. This has happened a lot with functional aspects, however the literature shows that there is still a lot unclear when it comes to the cycling experience and especially the aesthetic experience. Some research dated back to the sixties and neighbourhood research show some aesthetic factors which are important in the visual experience. However there is no clear study which defines these environmental aspects.

From these ideas it is possible to design a new framework in trying to answer the research question:

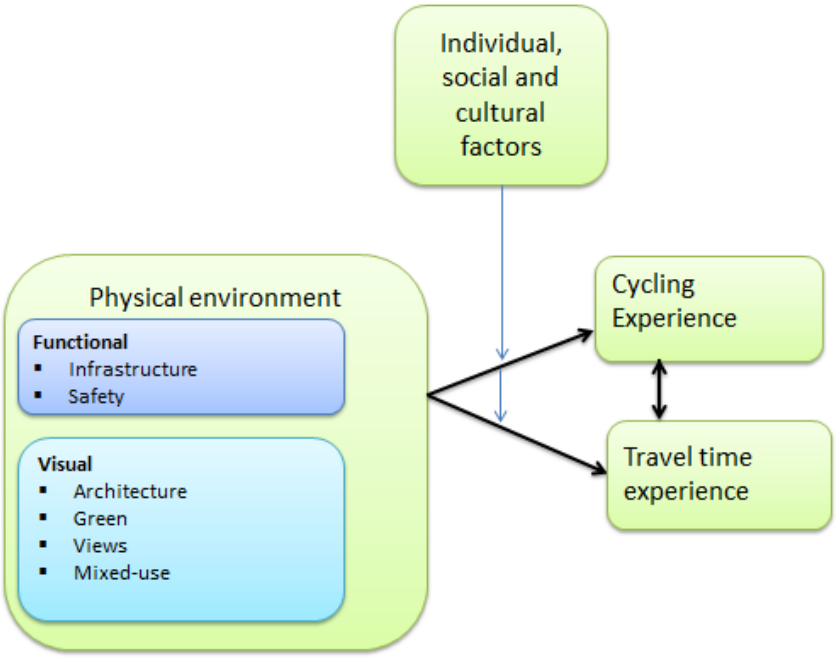
To what extent does (the attractiveness of) the physical environment influence the urban cycling experience of youth studying in Utrecht?

- ***Which physical aspects influence the cycling experience of youth studying in Utrecht and what influence do they have?***
- ***To what extent does the attractiveness of the physical environment influence the travel time experience of youth studying in Utrecht?***
- ***To what extent do the attractiveness of the physical environment and the travel time experience improve the cycling experience of youth studying in Utrecht?***

2.5.1 Conceptual model

The model shows 3 main relationships and 3 main elements influencing one another, firstly the cycling experience is the main research element.

Figure 2.5.1 Conceptual model



Interacting with the cycling experience is the 'the experienced travel time' (or perceived proximity) which is a part of the cycling experience, and a factor that influences the cycling experience. When someone feels a route is long and slow the experience is expected to be different from when it is experienced shorter and faster, this impact has been viewed in the paragraph about 'perceived proximity'/'experienced time' in relation to the arousal theory. The arousal theory also shows a link the other way around, since a dull or stressful experience can lead to a longer experienced time. Between the cycling experience and the perceived proximity thus exists a two sided relationship, when one is negative the other likewise is expected to be negative (or both positive). This is visible in the second and third question.

Both the cycling experience and the perceived proximity are influenced by (the attractiveness of) the physical environment, as is explained in the theoretical framework the physical environment can impact someone's cycling experience. This can be related to (perceived) safety, infrastructure or (perceived) aesthetics as a visual experience. These are expected to both impact the cycling experience and the perceived proximity. It can also impact the cycling experience through its influence on the perceived proximity / experienced time. The impact the physical environment can have on both the cycling experience and the experienced time is however influenced by different determinants as explained in paragraph 2. Both individual as well as social and cultural factors can influence the impact of the determinant physical environment.

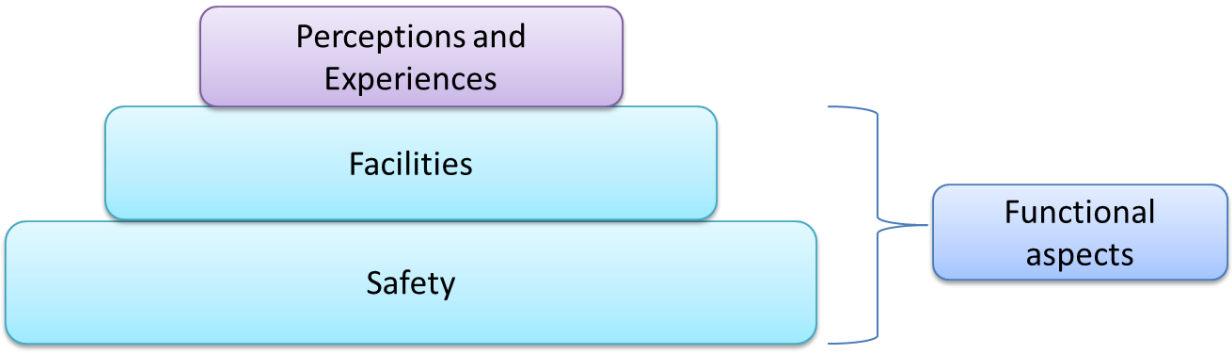
2.5.2. Physical environment schema

From the literature follows the fact that the physical environment influences peoples cycling experience, it is expected that different aspects of the built environment are of an influence. However no model of aspects influencing the experience is defined by any research up to now. The model of Pikora et al. (2003) is a simple example and somewhat covering the theory, however this research is based in the neighbourhood literature and focuses on the factors at the destination influencing the cycling decision. This research however is focused on the experience during the movement and in showing short videos of routes it will take away the destination element for the respondents.

Furthermore this research views the elements posed by Pikora et al. (2003) in a different way; where their research takes in account mostly functional and safety aspects, in this research these will only play a small part whereas more focus is on the perception and (visual)experience. This is based in the idea that in the Netherlands safety and facilities are less essential in the cycling experience than somewhere else, because the Netherlands is more advanced in its development and facilities are more extensive than in a lot of other countries and the cycling infrastructure entails more safety measures since traffic is adapted to the cycling culture.

The idea that cyclists in the Netherlands have more time to focus on other aspects during the route is based in the Hierarchy of Needs; an idea by Maslow (1942). In his pyramid cognitive and aesthetic needs are placed as least urgent, moreover he found that aesthetic needs are not separate but integrated with other needs (Stefansdottir, 2014). Safety and functionality have to be of a certain level to be able to experience other aspects in the environment, like aesthetics. This idea is explored, since the functional and safety aspects are seen as a basis for the experience resulting in the design of a new pyramid for this research. In this pyramid it is seen that the functional aspects of a route (safety and facilities) are on the basis of the pyramid (figure 2.5.2), when these are in place it is possible to focus on the perceptions and experiences of the cyclist.

Figure 2.5.2: Pyramid of needs for cycling



Based on the schema of Pikora et al. (2003) the first two categories (functional and safety aspects) in this research are put together in the category of functional aspects. The aesthetic aspect from Pikora et al. (2003) however is divided in four new categories which can be found in the schema below (table 2.5.2).

Table 2.5.2 Characteristics of physical cycling environment

Type	Characteristics	Definition	Aspects
Functional			
	Infrastructure	Infrastructure and safety are overlapping, in this research it is expected that the role of safety is only limited since it is only viewed in the experiment. Important factors here are street designs, traffic, maintenance, traffic controls, directness and more experienced factors like stress and flow.	Type infrastructure Safety Comfort Traffic
	Safety		
Visual / Aesthetic			
	Built Environment	Architecture of the built environment, historic vs functional and unique aspects can play a role. The historical conservation of architecture and the presence of pre-war architecture. Maintenance of the buildings and the street as well as uniqueness influence how this is perceived.	Sights Uniqueness Maintenance Peacefulness Stimulating Interesting Ambiance Diversity
	Green	Green in this research is overarching all the visible green spaces in the city, public green (parks and trees) as well as gardens. The availability and the maintenance of this green are important in this research.	
	Visual heterogeneity	View is not only what is seen, but also the experienced opportunities for changing a view. A frequently changing landscape and bending roads means that it can stimulate the cyclists curiosity and make them occupied with what is to be experienced. Diversity of architecture and bending roads can enhance this experience.	
	Mixed- use	Mixed-use is not defined as the opportunity to use or proximity to a facility, it is experienced in the effects of the mixed functions within certain areas of the city. Resulting in a richness of activities observed by the user of the space.	

The built environment remains as a category. Things like building styles and years, high-rise vs low-rise, functionality additionally maintenance and the uniqueness of architecture can influence the appreciation of the environment

Green is a new category rising out of the aesthetic element in which gardens, parks and trees are put together as visible green, in the chapter about aesthetics it has been viewed that these green aspects can have a positive impact on the cycling experience.

However two completely new categories are introduced, the first one is visual heterogeneity which not only entails sights and views but also the opportunity to change views frequently (based on: Jacobs, 2011; Gehl, 2011; Stefansdottir, 2014). The opportunity to navigate change routes and views frequently, to have no big building blocks but small blocks with many streets (Jacobs, 1961; Jacobs, 2011; Gehl, 2011).

Mixed-use is the second added category, based in different literature mixed-use adds to the experience and has a positive effect on the neighbourhood and a city. Jane Jacobs (1961) used this outside of the destination context and believed mixed-use makes a city more lively and attractive during different times of the day, this result is named ‘richness of activities’. That’s why in this

research this is an attribute that can be perceived and experienced by the cyclist throughout his route. This is viewed in the research of van Duppen & Spierings (2013) who see that the experience of passing through different territories creates different sensescapes. "*Ways in which commuters both sense urban spaces and apply cycling tactics constitute what has been defined as urban 'sensescapes' – to denote the relationship and interaction between the sensory body and the urban environment. " (p.2)* Route choices depend on tactics, based on what is happening in the streets, avoiding or deciding to ride through a street with bars and shops at a certain hour of the day, shows the importance of the functions in the street defining what is happening in this street. That is why mixed-use is defined not only as a destination or neighbourhood characteristic but as an route experience characteristic.

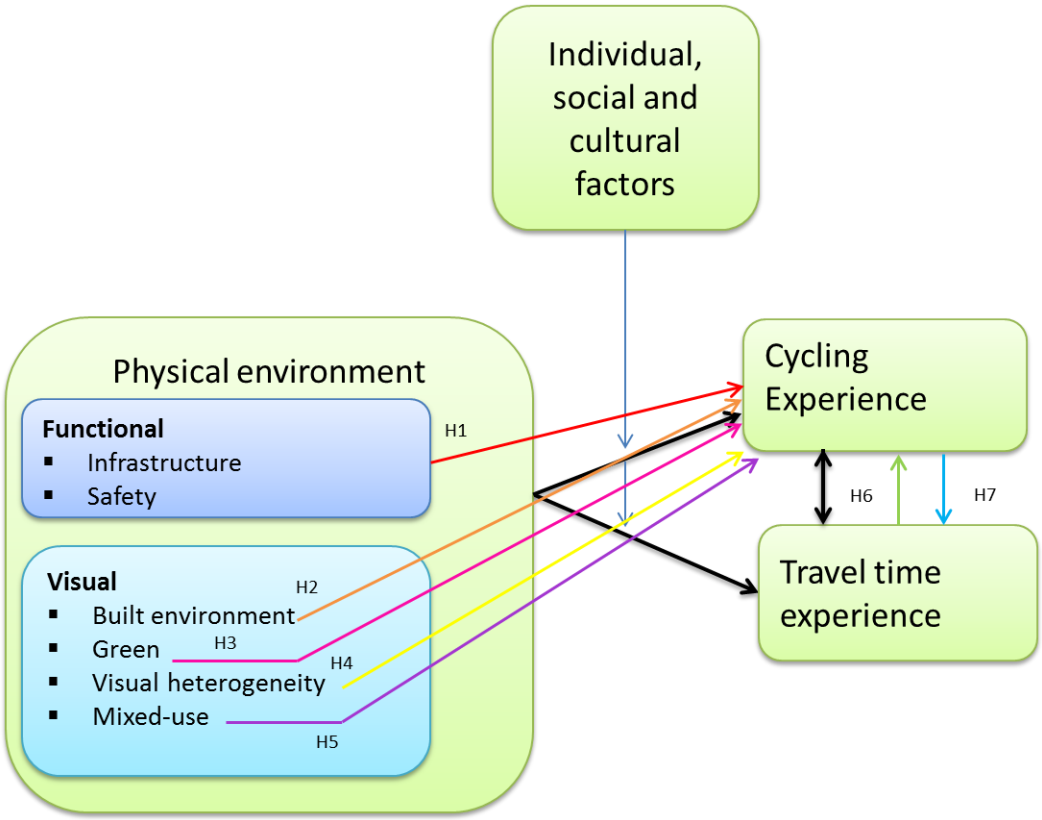
Factors from Pikora et al. (2003) maintenance and sights are incorporated within the four categories (see aspects, table 5.2), maintenance of streets, buildings and green is an overarching understanding which should result in a more positive effect of a characteristic. Sights (Stefansdottir, 2014) are important within all four categories and overlap with the idea of uniqueness, presented by Gehl & Savarre (2013), which makes places more interesting. Uniqueness is an aspect which is important in all 4 visual categories. The idea of sights is incorporated in the visual aspects as well as extended in the visual heterogeneity category. These three aspects are expected to have a positive impact.

All factors in this table can have a positive impact if they have the right composition for the user. The research will explore their influence on the overall cycling experience as well as for the experience of time. In the next chapter 'methodology' this will be elaborated on.

2.5.3 Hypotheses

From the research questions a conceptual model is derived, now that the schema of the different aspects of influence has been designed the hypotheses are made and schematically shown in figure 2.5.3

Figure 2.5.3: Hypotheses in conceptual model



H1: More appreciation of the functional aspects means a higher appreciation of the route
H2: More appreciation of the built environment means a higher appreciation of the route
H3: More appreciation of the green along the route means a higher appreciation of the route
H4: More appreciation of mixed use means a higher appreciation of the route
H5: More appreciation of the visual heterogeneity along the route means higher appreciation of the route
H6: A shorter feeling of time watching the video means a higher appreciation of the route
H7 More appreciation means shorter feeling of time watching the video of the route

All hypotheses are tested for the 6 different scenario´s resulting in knowing what scenario is mostly appreciated and what aspects of each scenario are highest and lowest appreciated. This way eventually the aspects of different routes and their effects on the cycling experience can be described. The stronger a relationship between the appreciation of an aspect in a route and the eventual appreciation of the route accounts for more importance of this factor affecting the cycling experience.

Explaining Hypotheses

H1: *More appreciation of functional aspects means a higher appreciation of the route*

This question tackles the expected relation between the functional aspects and the cycling experience, questioning whether a positive view on the functional aspects likewise causes a more positive cycling experience. In the survey this hypotheses is based on the route related questions: The functional environment construct (based on survey questions 6.1 till 6.7, see appendix), and questions about the appreciation of the route in total (Q 13-15 app.). The importance of this construct can also be measured through control question 4, about cycling habit, to see how the respondent appreciates the importance of this aspect within the route. The appreciation of the route can be controlled with question 16.3 in the personal question section, covering the order of appreciation of the different routes viewed.

H2: *More appreciation of the architecture means a higher appreciation of the route*

This question tackles the expected relation between the visual aspects and the cycling experience, questioning whether a positive view on the architecture likewise causes a more positive cycling experience. In the survey this hypotheses is based on the route related questions: The built environment construct (based on survey questions 7.1 till 7.6, in appendix), and questions about the appreciation of the route in total (Q 13-15 app.). The importance of this construct can also be measured through control question 4, about cycling habit, to see how the respondent appreciates the importance of this aspect within the route. The appreciation of the route can be controlled with question 16.3 in the personal question section, covering the order of appreciation of the different routes viewed.

H3: *More appreciation of the green along the route means a higher appreciation of the route*

This question tackles the expected relation between the visual aspects and the cycling experience, questioning whether a positive view on the green aspects along the route likewise causes a more positive cycling experience. In the survey this hypotheses is based on the route related questions: The green construct (based on survey questions 8.1 till 8.7, see appendix), and questions about the appreciation of the route in total (Q 13-15 app.). The importance of this construct can also be measured through control question 4, about cycling habit, to see how the respondent appreciates the importance of this aspect within the route. The appreciation of the route can be controlled with question 16.3 in the personal question section, covering the order of appreciation of the different routes viewed.

H4: *More appreciation of mixed use means a higher appreciation of the route*

This question tackles the expected relation between the visual aspects and the cycling experience, questioning whether a positive view on mixed-use aspect of the route likewise causes a more positive cycling experience. In the survey this hypotheses is based on the route related questions: The mixed use construct (based on survey questions 9.1 till 9.5, see appendix), and questions about the appreciation of the route in total (Q 13-15 app.). The importance of this construct can also be measured through control question 4, in the cycling habit part, to see how the respondent appreciates the importance of this aspect within the route. The appreciation of the route can be controlled with question 16.3 in the personal question section, covering the order of appreciation of the different routes viewed.

H5: *More appreciation of the visual heterogeneity along the route means higher appreciation of the route*

This question tackles the expected relation between the visual aspects and the cycling experience, questioning whether a positive view on the views/sights aspect of the route likewise causes a more positive cycling experience. In the survey this hypotheses is based on the route related questions: The views construct (based on survey questions 10.1 till 10.6, see appendix), and questions about the appreciation of the route in total (Q 13-15 app.). The importance of this construct can also be measured through control question 4, in the cycling habit part, to see how the respondent appreciates the importance of this aspect within the route. The appreciation of the route can be controlled with question 16.3 in the personal question section, covering the order of appreciation of the different routes viewed.

H6: *A shorter feeling of time watching the video means a higher appreciation of the route*

This experience of time related question follows from chapter 2.3.3. This question tackles the expected relation between the cycling experience and the time perception, questioning whether a short time experience results in a more positive appreciation of the cycling environment. In the survey this hypotheses is based on the route related questions: The expected time questions (questions 14.1-14.2 app) and the question about expected distance (perceived proximity) (question 14.3 app), and questions about the appreciation of the route in total (Q 13-15 app.). The appreciation of the route can be controlled with question 16.3 in the personal question section, covering the order of appreciation of the different routes viewed and the time experience in relation to other routes watched can be controlled with question 16.2. If questions 16.2 and 16.3 show opposite trend, the relationship is as expected in this hypotheses.

H7: *More appreciation means shorter feeling of time watching the video of the route*

A Higher appreciation of the route means a shorter expected time watching the video

This question tackles the expected relation between the cycling experience and the time perception, questioning whether a positive appreciation of the cycling environment results in a shorter time experience. In the survey this hypotheses is based on the route related questions: The expected time questions (questions 14.1-14.2 app), and questions about the appreciation of the route in total (Q 13-15 app.). The appreciation of the route can be controlled with question 16.3 in the personal question section, covering the order of appreciation of the different routes viewed and the time experience in relation to other routes watched can be controlled with question 16.2. If questions 16.2 and 16.3 show opposite trend, the relationship is as expected in this hypotheses.

3. Methodology

This chapter describes the research method. The goal is to research the cycling experiences of Dutch youth in Utrecht in different physical environments, to eventually see what aspects in the environment are enhancing the cycling experience and thus stimulating cycling. The used methods and instruments are described. Secondly, in paragraph 3.2, the target group of the research is described, as well as how and when the data collection took place. The route locations which are used for the research are described and explanations for choosing these locations are given (3.3). Then the survey is explained using a division in three survey parts.

3.1 Quantitative research

The research goal is examined through quantitative methods, which means the research has a deductive character. Theories coming from the literature are tested for the research population (Bryman, 2004). Based on the literature a survey has been designed which focuses on youth studying in Utrecht. In this paragraph the 'why' of the methods chosen is explained, this counts for the survey and the video research.

3.1.1. Surveys

The idea behind this quantitative research is to find statistically significant relationships between different physical aspects, perceived proximity/time and the cycling experience. This is a more objective way of showing which elements can have a positive or negative influence on the cycling experience. Most research up to now has focused on travel satisfaction and experience, using surveys for instance after the journey (or during e.g. with train travel). This research wants to expand this research and find out what people experience during a journey, set up in an experimental environment, right after visually experiencing it.

Other research on the cycling experience has been qualitative research like cycle-alongs (Duppen & Spierings, 2013). This quantitative research however wants to go beyond this qualitative research and not only view a respondent in one environment, but show multiple environments and try to statistically show differences between the experience of these different environments and their physical aspects. Not only summing up possible effects on the experience, but to proof how the five categories of elements (functional, built environment, green environment, mixed-use and visual heterogeneity) impact the cycling experience.

In social sciences the survey is a tool which is often used to describe, predict and explain behaviour (Boeije et al., 2009). The data collected in the survey can show a distribution amongst the research population. With the questionnaire it is possible have more respondents answering the same questions to point out statistical characteristics influencing the cycling experience. The impact of the physical environment on the experience is measured with questioning statements with a 5 point likert-scale (see paragraph 3.4), building different constructs for each element. The videos show moving images giving the best information on these visual physical aspects, since the respondent is able to view a moving route and its physical aspects.

3.1.2 Video- research

Up to now the quantitative research which has been done has mostly been based on questionnaires about the cycling experience, and some on (manipulated) photos of different environments (d'haeseleer, 2013; Hagen et al., 2012; Pikora et al, 2003; Heinen et al. 2011). Now to go beyond this, it is important for the respondent to really experience different environments, but that all the respondents have the same experience. With this the conditions of the environment are controlled, however the realism of the experience does decline since there is no actual movement, effort, scent or feelings of comfort. The embodied experience is thus less than in cycle-alongs however the conditions in the videos are the same for every respondent. That's why the research is done based

on video's. In line with the existing literature six scenarios have been established based on the aspects found in chapter 2. These entail different types of aspects, which are based on the schema presented in paragraph 2.5. This type of research has been chosen to measure cycling experience, but to do this in a standardised and controlled way. Experiencing an environment as said before happens through different senses, that's why it is important to use video and sound material to excite the senses. The moving images can be watched for a longer period as well as show more different images than pictures. Moving is inherent to cycling, which makes watching video's a more natural way to view possible environments.

It is important to show the cycling environments in the same way so that every respondent gets the same impressions. This is different from when the researcher goes on the street with a respondent, in this case the environment can be different every time and it is hard to measure all the different influences which can impact the respondent. For instance traffic situations, weather and social environments which impact the way a respondent perceives the visual environment. In a video these circumstances can be kept neutral and the same for each respondent.

3.2 Research population

The research has taken place in Utrecht which is a city in the centre of the Netherlands. The Netherlands is seen as a cycling country. 26% of all movements are by bicycle, a country which has more bicycles than inhabitants, and where 21% of the population cycles every day. Utrecht as a province has one of the highest numbers of bicycle use. In the city of Utrecht already 43% of the people travelling from A to B under 7,5 KM travel by bicycle (Fietsersbond, 2007; Gemeente Utrecht 2015)

This research will look at the youth in Utrecht. In this research youth is defined between the age of 16 to 26. From 16 onward youth in the Netherlands can finish high school and go to study as well as get a scooter driving license, from 18 they can get a driving license as well as free public transport when they study. Figure 1.2 shown in the introduction shows a decline in bicycle use from this age and an even bigger decline from the age of 18.

3.2.1 Recruiting respondents

The population of this research is defined as students between 16-26, studying (not necessarily living) in the city of Utrecht. The respondents will be looked for within three different educational levels: MBO, HBO and University. The places where the students are asked to participate is the place where the surveys are held, so they can stay where they are and don't have to put too much effort in participating in the research. A lot of students have some time off during the day for instance between classes. This research will try to make use of this time to convey students to participate. People have been asked in the hallway and lunch area whether they have some spare time to help with the research. Moreover snowball methods are used to convey more students to participate.

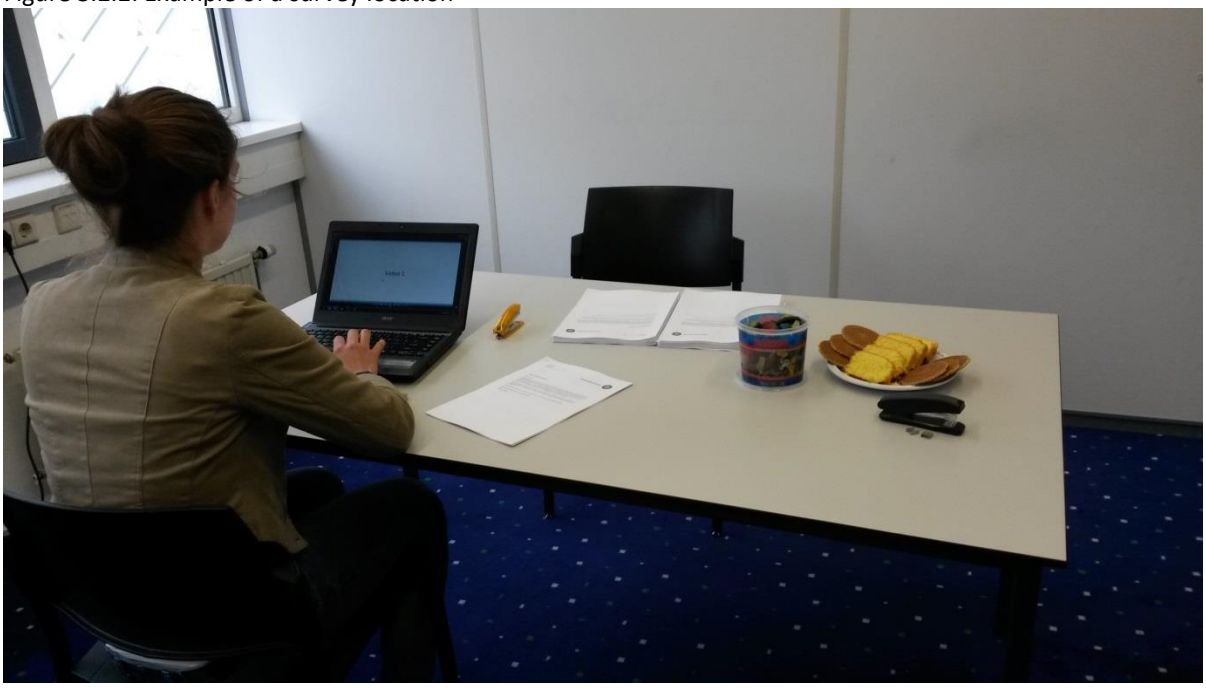
However at the MBO schools the participants are tested with the entire class during a lecture, since these students do not often have in between class time and are working on their internships outside of school most of the time. Three classes are picked to represent the MBO population, at University and HBO it's important to find the same amount of respondents. For these students it is possible to watch the videos and fill in the survey in small groups together. In advance all participants are informed about the importance of filling in the survey individually and not discussing the answers. The goal set is to get at least 20 respondents within each educational group.

The respondents have been gathered in the last weeks of May and the first weeks of June (2015) this means that most students have been studying here for a while and that the year is almost over. However it means that it is harder to find respondents with spare time since they all have deadlines and study pressure. About 65% of the respondents declined participation immediately, there was a group (around 5%) who offered to make the survey by email or make an appointment for another time. However most of the times this was too late to include these possible respondents.

3.2.2 Survey conditions

To make everyone participating in the research as comfortable and relaxed as possible the research takes place in a laid back friendly environment. In particular, a small separate room in university and HBO locations was used. The respondent is offered drinks and cookies/candy while watching the video and filling in the survey. The respondents can watch the video's alone or together in a small group, so there isn't much disturbance while watching the video's and answering the questions. While the data is collected at least one person is available to help with starting and stopping the video's and answering possible questions. For instance how to fill in an order in question number 16, having a question about the survey occurred in about 25% of the cases. However questions about the video's watched (for instance, which area is this?) were not answered until the end of the survey.

Figure 3.2.2: Example of a survey location



The intensive process of video research with large surveys resulted in an intensive process of data collection. This means that a lot of respondents reacted differently in the research. At University most tests have been taken individually, this means that there was little distraction and people could seriously focus on the videos. At HBO the research was mostly individual but sometimes in small groups of 2/3 people, that means that distractions could occur during the survey, like talking about the area which is showed. The number of questions asked during the research occurred equally in both situations.

At the MBO the surveys were filled in during a lecture with the entire class of 10 people or in one case only a part of the class (just 4 people), there was less permissiveness in this case which resulted in the fact that the research was not always taken seriously. Respondents were playing with their cell phones and they had to wait for everyone to finish before they could pursue watching the next clip. This resulted in more boredom and annoyances. While reading the filled in surveys less questions seemed to be understood or filled in correctly, and less questions were asked during the survey. This could be due to the fact that the research was in a less personal environment and that there was less contact between the respondent and the interviewer.

In some cases there was time-pressure while filling in the survey. The list was supposed to take about 30 minutes, however when planned within this time-span sometimes there were some delays. With the explanation, getting seated. The time for filling in the surveys had a margin between 20 and 45 minutes.

Some respondents decided that despite the instructions to first watch the video and then fill in the questionnaire to fill it in during watching. Mostly they were bored and thought the videos took too long, this means some respondents paid much less attention to watching the videos. There's a risk that their answers are more related to their earlier experiences with the route or just small parts of the video (f.i. only the beginning).

However there were a lot of positive reactions to the research method, some respondents found watching the video alternately with answering the questions pleasant. Once they've read the questions they knew what to do and could focus on watching the videos. The originality and the casual atmosphere were appreciated. In general the research took quite a long time and demanded a lot of concentration from the respondents. That's why for a next research an idea would be to make a shorter question list more focused on one thing in the route, or to show less or shorter videos.

3.3 Scenario's

In paragraph 2.5 a schema has been presented to show the properties on which the different environments should differ, based on this table 6 different scenarios within the city of Utrecht are chosen. The properties and conditions to which the scenario's must live up are described in this paragraph.

3.3.1 Conditions

The scenario's all last 2,5 minutes, this is enough time to take a look at the different environments and move at least 600 meter. Without the respondent getting too bored and distracted watching the videos, and without the overall participation lasting over 30 minutes. Within this 2,5 minute time-span different distances are covered for each scenario. The distances within the videos don't differ too much since it is important to keep the cycling speed around the same level (18km an hour), the differences in distance are mostly due to different traffic circumstances as well as infrastructural differences (lower speeds in sharper bends). Below the different routes and distances are described , followed by their schema of characteristics. The videos have all been filmed with a Go Pro camera, from a first person perspective, from the top of the head of someone riding a bicycle through the city of Utrecht. This camera is an important tool, because it stabilizes shocking images (up to a certain level so conditions of roads/pavements are still clearly visible).

While filming it was important to avoid extreme social or physical conditions. The circumstances in the different videos are kept neutral and equal. Weather conditions are good in all the video's with some sun and clouds and no extremes (like rain or wind). Weather conditions were also important for recording the ambient sound, since this becomes disrupted when there is a lot of wind.

Social conditions are important as well, sometimes people in the streets responded to the camera. That's why a lot of video's needed retaking since for instance someone noticed the camera, people were shouting and calling names or cars were honking their horn.

Furthermore the traffic circumstances are timed to be not too busy, so the hours of filming are mostly somewhere in the middle of the day when the roads are not too crowded and chaotic. However differences can still be seen between the different scenario's and their traffic conditions. Dangerous situations have been avoided, while filming with a camera attached to your head it is not possible to look behind you, sometimes the filming needed to stop because of this. It was important to cycle in a straight line, and not too close to the side of the road since this can curve images on the edge because of the wide angle lens.

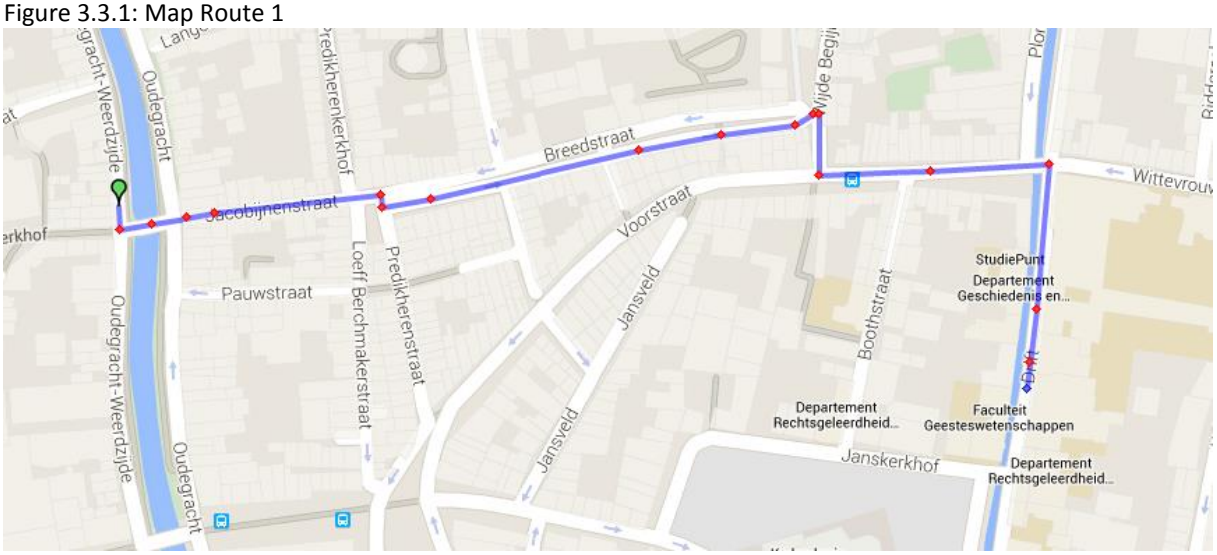
Figure 3.3.1: Filming conditions

3.3.2 Routes

Based on the ideas stated in chapter 2.5 and the conditions stated in 3.3.1, six routes have been defined and filmed to contain the 6 different characteristics defined in chapter 2 (infrastructure, safety, built environment, green, mixed-use and visual heterogeneity). Each route has a different combination of characteristics which are explained more extensively. The expectations in relation with these characteristics are discussed.

Route 1: Binnenstad (inner-city), 665 meter

Figure 3.3.1: Map Route 1



Description: The area Binnenstad (inner-city of Utrecht), has an historic centre. The infrastructure contains a lot of old narrow streets with uncomfortable pavements and the streets are busy, however most zones don't have a lot of car traffic which could enhance feelings of safety. Factors like stress could be higher in this busy area and the traffic flow is more congested. The architecture of the inner-city is unique in its kind (werfkelders, a lower level where warehouses were located in the 13th century along the canals used for storage from ships), the city is historic and has high density. Old and unique buildings stemming from the middle ages and protected cultural heritage. Building blocks are short, these aspects engage nice sights and opportunities for changing views. There is little green in the inner-city except for some trees near the water, the canals however do offer a unique view. Next to high density the city centre has a lot of mixed use.

Table 3.3.1: Physical Characteristics route 1

Type	Characteristics	
Functional		
	Infrastructure	High density, low comfort, busy streets, on-street cycling, narrow streets, slow flow, congestion, a lot of other traffic but low number of car traffic, high number of busses,
	Safety	
Visual / Aesthetic		
	Built environment	Historic, unique, small blocks low -rise buildings
	Green	Little green, some trees near 'canals' on street or squares.
	Visual heterogeneity	Small blocks, a lot of opportunities for changing views, a lot of sights
	Mixed- use	High density, a lot of mixed-use, use at different times of the day

Figure 3.3.2: Video frames route 1:

Route 2: Overvecht, 754 meter

Figure 3.3.3: Map Route 2

Overvecht is the biggest post war development area of Utrecht, which entails 9 districts amongst which is a business area. The area has been developed from a more functional point of view in the modernist days. According to the municipality of Utrecht the area nowadays knows a lot of redevelopment since there is more market for variation in building (blocks) and demand for low rise and single family housing. The area has more demand for meeting places and the shopping areas need renewal (Gemeente Utrecht, 2015b).

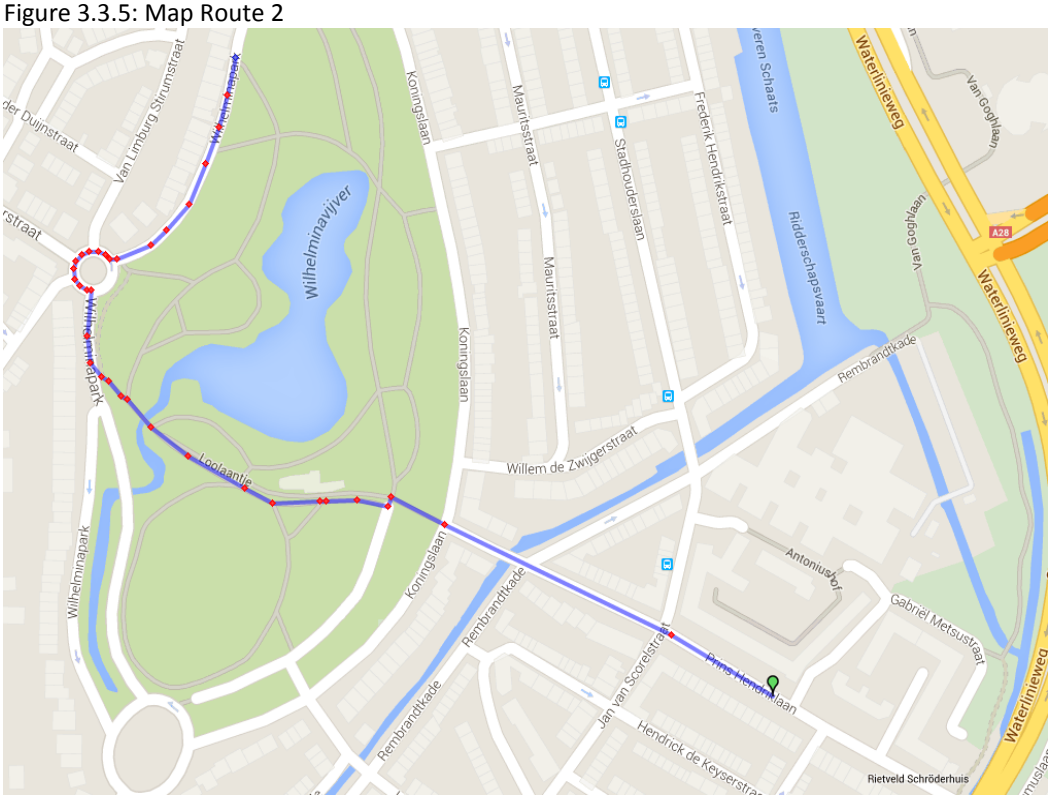
Table 3.3.2: Physical Characteristics route 2

Type	Characteristics	
Functional		
	Infrastructure	Broad cycling lanes, straight lines, on road cycling and separate cycling lanes, busy car roads, many roundabouts
	Safety	
Visual / Aesthetic		
	Built environment	Modernist, high rise, functional
	Green	A lot of green, widespread between high rise, parks, water.
	Visual heterogeneity	High-rise, big blocks, no real sights, some green, long roads with little bends. Route filmed with few change in directions.
	Mixed- use	Little/no mixed use, big residential areas, some shopping areas but separate from the residential areas.

Figure 3.3.4: Video frames route 2:

Route 3: Wilhelminapark (Oost), 840 meter

Figure 3.3.5: Map Route 2



Wilhelminapark is a monumental city park, which has an important busy cycling route running through, this busy lane is only part of the route. Surrounding the park are some villa's and mansions dating back to the 1900's.

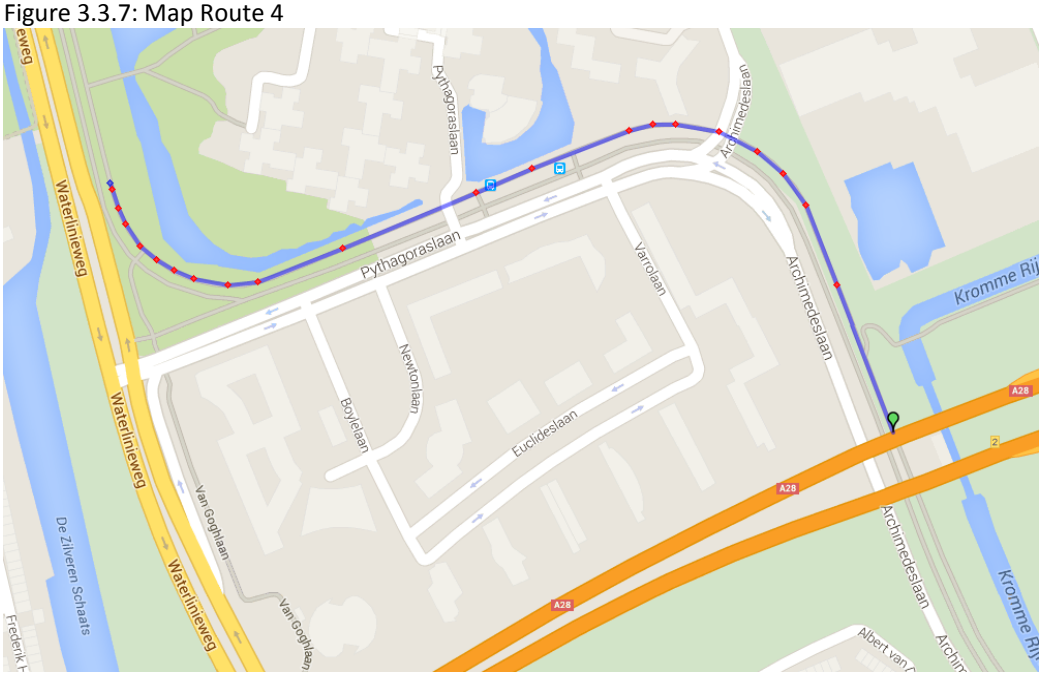
Table 3.3.3: Physical Characteristics route 3

Type	Characteristics	
Functional		
	Infrastructure	Busy cycling lane, quiet neighbourhood, little car traffic, part of the route is a cycling street/part is on street cycling, broad roads.
	Safety	
Visual / Aesthetic		
	Built environment	late 1800's beginning 1900's housing, luxury mansions and office villa's, English design garden with art and monumental teahouse, low rise buildings.
	Green	English design park, lots of trees, green separating roads, gardens
	Visual heterogeneity	Greens, parks, a lot of bends in the street and side streets, different sides and opportunities to change direction
	Mixed- use	Some offices, some eating and drinking opportunities, park with a lot of leisure use

Figure 3.3.6: Video frames route 3

Route 4: Rijnsweerd, 740 meter

Figure 3.3.7: Map Route 4



The development of Rijnsweerd started in 1974, it is a business area in the city of Utrecht with little residential function. It separates Utrecht science park from the inner-city and has a lot of commuters (between city- to work/study) coming through every day. It has separate bus streets and a lot of public transport.

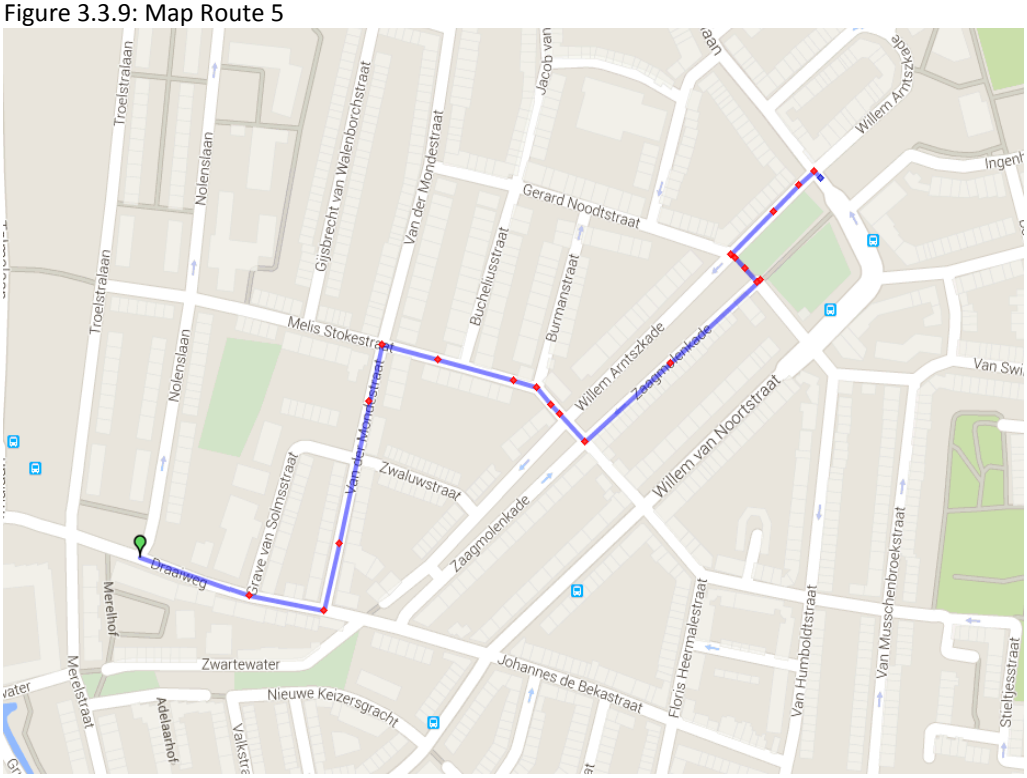
Table 3.3.4: Physical Characteristics route 4

Type	Characteristics	
Functional		
	Infrastructure	Comfortable broad cycling lanes separated by greens, lot of traffic but no hindrance in cycling, lot of cyclists, many traffic lights
	Safety	
Visual / Aesthetic		
	Built environment	From 70's onwards modernist and post-modernist architecture, mostly functional to house large offices, high rise.
	Green	Many trees, strokes of green and water, some parks between the buildings
	View	Low street density one continuous cycling route, long stretching views
	Visual heterogeneity	Only office space, some residential function

Figure 3.3.8: Video frames route 4

Route 5: Tuinwijk (Utrecht Noord-Oost), 721 meter

Figure 3.3.9: Map Route 5



Tuinwijk, is a green area built according to the English garden concept, space for green but still a compact design. Tuinwijk is built around 1900's and has different buildings and sights built in the Amsterdamse School style.

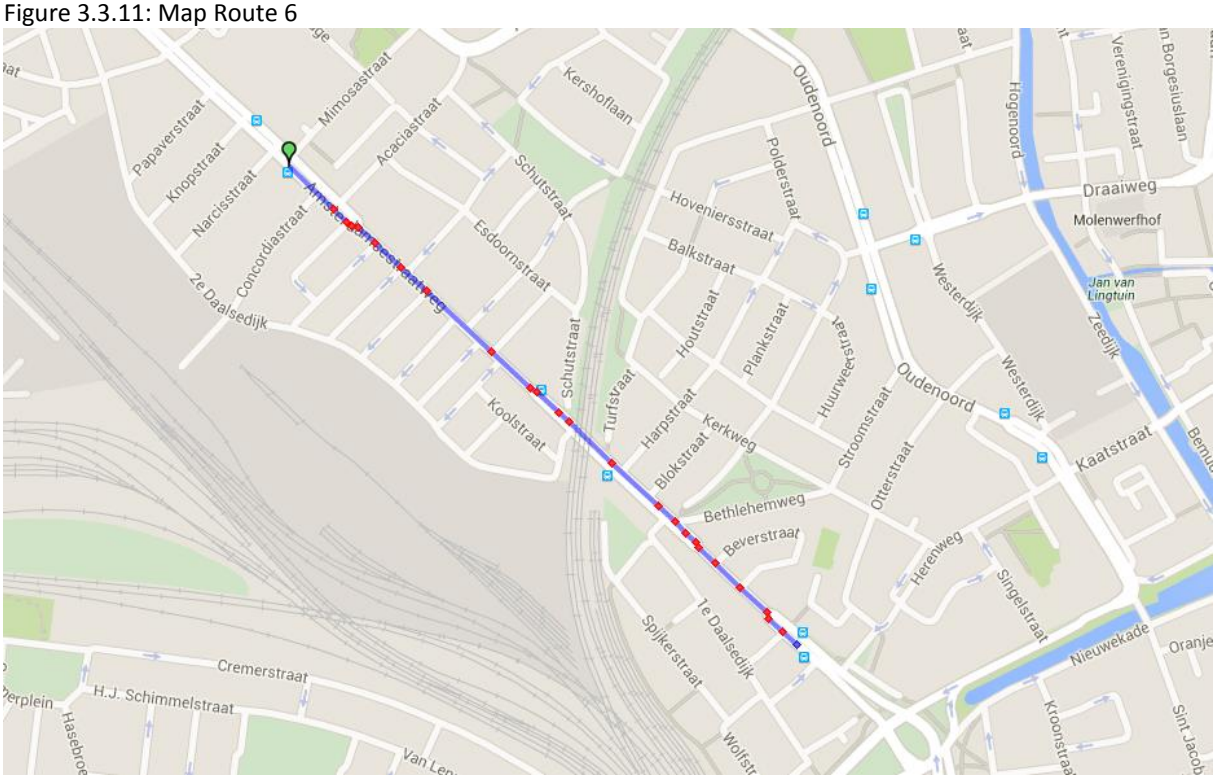
Table 3.3.5: Physical Characteristics route 5

Type	Charactaristics	
Functional		
	Infrastructure	On road cycling, bumpy low comfort roads, low traffic density, on street parking, low traffic speed.
	Safety	
Visual / Aesthetic		
	Built environment	Early 20th century housing, high density housing, Amsterdamse school style, built as early city expansion
	Green	Many trees, visible gardens and some small parks, public green
	Visual heterogeneity	High street density, a lot of bends, change of views, small building blocks
	Mixed- use	Residential neighbourhood, little mixed-use

Figure 3.3.10: Video frames route 5

Route 6: Amsterdamsestraatweg (Noordwest), 792 meter

Figure 3.3.11: Map Route 6



De Amsterdamsestraatweg is an important road known for being 5 kilometre of length. At the end of the 20th century the street had a bad reputation and a lot of vacancy, criminality, loitering, graffiti and a garbage problem. Now the municipality has done a lot of restructuring. The street is very multicultural and contains a lot of small shops, bakeries and supermarkets.

Table 3.3.6: Physical Characteristics route 6

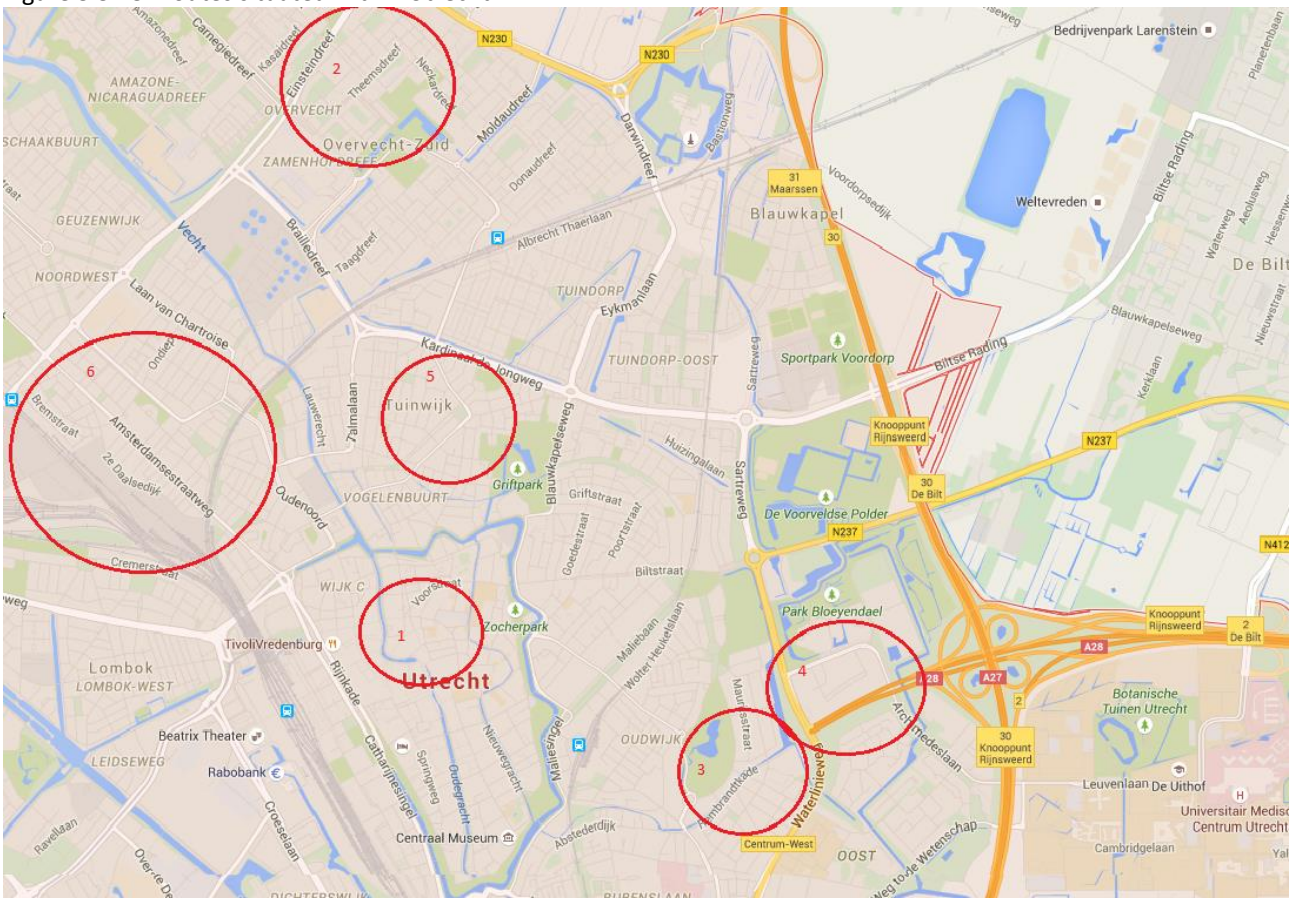
Type	Characteristics	
Functional		
	Infrastructure	Separated (by parked cars) cycling lanes, busy traffic (cyclists and cars), a lot of congestion, high comfort cycling lanes (red tarmac), busy, complex crossings, one straight road
	Safety	
Visual / Aesthetic		
	Built environment	Folksy, pre-war housing (early 1900's up to 40's), low rise buildings
	Green	Some trees between roads and cycling lanes, park at the end of the road. No visible gardens or other green
	Visual heterogeneity	One straight road, but some side-streets. Sights like the water tower, and pre-war housing
	Mixed- use	A lot of mixed use, different shops and small businesses as well as cafés and coffee bars

Figure 3.3.12: Video frames route 6

The routes are assigned a random number from 1 to 6 and put in three random orders. This is because the MBO population has been surveyed in three groups which results in the facts that there's a limited number of orders which could be shown to the students. The route numbers and the position of the routes within Utrecht are displayed below. Within the three orders no scenario follows another scenario twice, which means they completely differ from each other. All clips are shown in two out of three random orders, which results in the fact that not only the random orders but also the different routes are equally watched by the respondents. All three orders are shown variably to the respondents. Eventually having all been shown equally spread out over the three target groups (Namely MBO, HBO and University students).

A: 1352
B: 2461
C: 5643

Figure 3.3.13: Routes situated within Utrecht



3.4 Survey Questions

To measure the experience of the respondent a survey has been designed (See appendix 3). The survey consists of three different parts: Cycling habit questions, experience of the routes questions and the personal questions. The respondent first had to read the cover page, explaining the research and the rules of the game (considering anonymity, how to fill in questions and the time-lapse). Then the respondent could start with the first two pages of questions: the cycling habit questions (pt 1). After filling in the questions the respondent is kindly asked not to turn the page but to watch the first video. After watching the video the video refers back to the survey and the respondent can start the second part of the questionnaire, the route related questions, while the researcher pauses the video. This happens four times in total. After the last route related questions the respondent is requested to turn the final page and finish the questionnaire, the personal questions (pt. 3).

3.4.1 (pt. 1) Cycling habit questions

These questions (Question 1 to 4) arose from the idea in the literature that people who cycle often appreciate a cycling environment more and differently than their non-cycling counterparts (see chapter 2.2). This part measures to what extent the cyclist has other options to choose from, since theory shows that people who have other travel options when often value cycling more when they choose to do it. In this part also questions what aspects the respondents find important during their cycling route, this is what has been central in some other research and serves as a control question for the questions attached to the different scenario's. After these questions the respondent starts with watching the first video.

3.4.2 (pt. 2) Route related questions

The route related question list (Question 5 to 15) must be filled in 4 times, each time after the respondent has watched a video, questions about this video must be answered. The first question asks whether the respondent is familiar with the route, literature shows that when someone cycles a route more often they experience the route in a different way than when someone cycles/sees it for the first time (2.3). After this the questions about the route are divided into 5 different categories, the first category questions the functional aspects and how the respondent views the infrastructure and traffic safety. The second category is based on the buildings along the route and the architecture, questioning its uniqueness as well as its maintenance. The third category focuses on the green along the route. The fourth is focused on questioning mixed use and the final category questions the visual heterogeneity along the way. These categories are found in chapter 2.4 and put in a schema in chapter 2.5. In all these questions statements are made and people can agree to these statements on a five point scale, totally disagree to totally agree.

Table 3.4.2: Items in Category

Functional	**Built environment**	**Green**	**Mixed-use**	**Visual heterogeinity**
Safe	Variety	Quantity	Variety	Variety
Quality of the road	Ambiance	Variety	Ambiance	Interesting
Busy	Attractive	Ambiance	Liveliness	Peaceful
Stressful	Interesting	Attractive	Attractive	Challenging
Comfortable	Unique	Interesting	Interesting	Surprising
Traffic flow	Maintenance	Peaceful		Incentive to curiosity
		Maintenance		

After these categories the questionnaire asks the respondent how they would feel while cycling the route. The final part lets the respondent value and grade the route, and make estimations of how long it lasted (minutes) and estimate the distance (meters). This is to check whether the respondent feels that routes they give higher grades, feel shorter in time or less long in distance (in line with theories about perceived proximity 2.3.3).

3.4.3 (pt. 3) Personal questions

In the final part the respondent has to put the routes in order of experienced distance, time and of attractiveness (question 16). This is a question to control whether they still agree with what they filled in the first time (grade, distance and time) after seeing all four routes and comparing these routes. Eventually some individual factors like age, gender, place of residence, cultural background and study years are asked (question 17). Since literature points out that these aspects can relate to different cycling attitudes (2.2). These aspects can show whether the sample is significant for the target group population.

On the bottom of the final page the respondents are asked if they wants to get an update on the results as well as whether they have any comments on the research. No comments have appeared in this section.

4. Sample Analysis

Before starting the data analysis it is important to analyse the data collected, to figure out what respondents are in the sample and how this could possibly influence any testing or results. At the end of the data collection the total number of respondents is 63. With an almost equal division amongst the different educational levels. MBO has the highest amount of respondents and HBO the lowest. Each route is viewed by respondents an equal amount of time, namely 42 times. This means that for all the routes the sample size is sufficient (N ≥30). Series A, B and C are all watched an equal amount of times 21. However at the different educational level N≤30 which means these cannot be assumed to have a normal distribution and thus some tests are not possible.

Table 4.1: Number of surveys

	WO	HBO	MBO	Total
A	6	5	10	21
B	5	6	10	21
C	9	8	4	21
Total	20	19	24	63

In the following a closer look at the respondents is given by reviewing descriptive statistics and relationships between different statistics. Since the sample is not stratified, due to the way data collection took place (see methods chapter 3), there is no random sample. The results of this research are not valid for the entire Dutch student population, just for the respondents in the sample. However the results still can be an indicator for the student population within Utrecht which in turn might be relevant for the Netherlands as a whole.

4.1 Non-response

There are two variants of non-response, overall non-response concerning possible respondents who rejected participation (Boeije et al, 2009), and item non-response which entails not answering certain questions in the survey.

Overall non-response

During the gathering of respondents the actual non-response is not accurately tracked. This is due to the different recruitment methods. The different ways of recruiting makes it more difficult to get an exact non-respond percentage. Based on the selected methods it is hard to give an estimation of non-response. For instance, due to a last-minute cancellation of one out of three MBO classes because of a tight lecture schedule, is one form of non-response. Or the fact that when one MBO class was questioned almost half of the class left because they had other things to do, like the resit of a test. Another form of non-response is approaching a possible respondent during a break at the HBO school. Yet, this respondent rejected participation because of lime-limitations. Another form would be someone offering to fill it in later, but this is too not possible due to the time limit of the data gathering period of this research.

Eventually a rough estimation of non-response is estimated to be 65-70%. This is based on the different declines received in actively asking people to participate in the research at the educational locations of HBO, WO and MBO. Eventually 43 people at these locations have participated. Most people declined to cooperate due to time-limitations. For instance because of exams, work and deadlines or they mentioned the research time (30 minutes) was too long.

Item non-response

In the survey different questions remained unanswered, have been filled in incorrectly (too many answers, unclear which box is filled in) or aren't applicable for the respondent. In the SPSS dataset these questions are called a missing value. This non-response shows whether people were uninclined to fill in this question, maybe didn't understand the question or had a different interpretation of this question.

In general the personal questions are completely filled in, only one respondent didn't answer the question about age, in 2 cases place of residence is left blank. The question about cultural relations may have been interpreted wrongly by some respondents (2) who filled in to be connected to all possible cultures. Overall the personal questions tend to be completed and thus clearly defined. No questions have been asked by respondents about these questions.

Almost all respondents filled in the questions about cycling (transport) habit, there are some questions which have been skipped by one respondent (Public transport in Utrecht, OV-product) and another respondent did not fill in questions about the importance of the different aspects during the route. Two people did not answer the question about the importance of the traffic situation. However in general, the questions about transport behavior have been answered well, no questions by respondents have been asked and are thus concerned to be clear.

The route related questions were not answered in 2 out of six routes for each case, so all questions have at least 21 missing values. There are some questions which have not been filled in correctly or were skipped and two respondents didn't finish the questionnaire. However there are no striking differences between the route related questions and their missing values. There however are strange answers regarding questions about estimated time and length of the route, which could point in the direction of misunderstanding the question or lack of interest. The same counts for filling in different orders of the routes after seeing all videos. This question is most frequently not filled in with a maximum missing value of 7 respondents.

In general the survey is filled in completely and it is assumed the questions were clear, this is also due to the fact that a researcher always was available to answer questions and give instructions.

4.2 Respondent descriptives

Age

With the data it is possible to look at the age of the respondents in the sample. Out of 63 respondents 62 filled in the survey question on age. The average age of the sample is 20,56, of which most respondents are 22, followed up with 17 year-olds. The fact that there are a lot of 17 year old respondents can be related to the fact that the MBO first-years are mostly 17 year old. The number of 22 year-olds could be related to the fact that most students in the sample are a few years in their study (mean 2,28, max 8 years). The average age of the students in the sample can be compared to the average age of students between 16-26 studying in the Netherlands which is 20,40 (CBS statline, 2015). To test whether the sample is representative for the student population in the Netherlands a goodness of fit test is performed. This Chi^2 test shows whether there is a significant difference between the two populations. The test shows that the age division in the sample group is related to the age division of the student population age 16-26 in the Netherlands: Chi2(10)=14,88; p=0.05 (with 95% certainty). Which means that the sample is representative for the population when it comes to age.

Table 4.2.1: Age in Sample

Age	# population	% population	# Sample	% Sample
16	38670	3,71	3	4,84
17	98259	9,43	10	16,13
18	141010	13,54	5	8,06
19	154370	14,82	7	11,29
20	143685	13,80	4	6,45
21	125183	12,02	6	9,68
22	107130	10,29	12	19,35
23	87393	8,39	4	6,45
24	65664	6,31	6	9,68
25	47042	4,52	2	3,23
26	33045	3,17	3	4,84
	1041451	100	62	100
Mean	20,40		20,56	

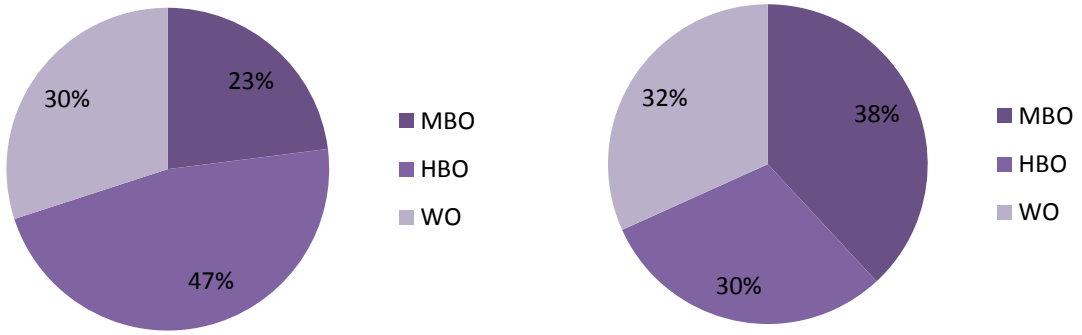
Table 4.2.2: Descriptive statistics of respondents

Gender	Male: 34,9%
	Female: 65,1%
Age	Mean: 20,5 (std. dev.: 2,832)
	Min: 16
	Max: 26
Educational level	MBO: 38,1%
	HBO: 30,2%
	WO: 31,7%
Years of study in Utrecht	Mean: 2,28 (std. dev.: 1,628)
	Min: 1
	Max: 8
Place of Residence	Utrecht: 42,6%
	Not Utrecht: 57,4%
Living conditions	Not with parents: 36,5%
	With parents: 60,3%
Connected to Dutch culture	Yes: 90,5%
	No: 9,5%
Connected to different cultures (Multiple answers possible)	Dutch culture: 68,7%
	Moroccan culture: 8,4%
	Turkish culture: 10,8%
	Surinam culture: 4,8%
	Antillean culture: 2,4%
	Other: 4,8%
Owning a bike	Yes: 95,2%
	No: 4,8%
Cycling habit	Never: 7,9%
	± 1 a month: 6,3%
	± 1 a week: 12,7%
	< 3 times a week: 7,9%
	≥ 4 times a week: 65,1%
Owning a student traveling card	Yes: 66,7%
	No: 31,8%
Public transport habit	Never: 6,3%
	± 1 a month: 17,5%
	± 1 a week: 23,8%
	<3 times a week: 17,5%
	≥4 times a week: 33,3%
Driving license	Yes: 61,9%
	No: 38,1%
Driving habit (only filled in by people owning a licence)	Never: 0,0%
	± 1 a month: 9,5%
	± 1 a week: 7,9%
	<3 times a week: 4,8%
	≥4 times a week: 6,3%

Education

As described in the methodology this research did not try to represent the different educational levels at the same proportion as the student population is in Utrecht. Figure 4.2.1 shows that the number of MBO students is overrepresented in the sample than in the population while HBO is represented less.

Figure 4.2.1: Percentage of students divided in educational level in the Utrecht (Left) and in the sample (right)



Source: Labyrinth 2011

The educational background of the respondents is reflected in the age division of the respondents. This means that in the results there is a connection between age and educational level. MBO students (17,9) are youngest on average followed by HBO students (21) and WO students respectively. This is an expected relation because the high school education for MBO level takes only 4 years while this is 5 years for HBO and 6 for WO.

Gender

In the sample the division between male and female is uneven, more women filled in the survey (65,08%). This might be related to the fact that some classes contained more female students than male students. The location where the surveys were held is of influence since for instance the questionnaire at HBO was held in faculties which tend to contain more women (e.g. Daltonlaan, Society & Law), moreover the MBO school for hairdressing consisted of solely females. Moreover Utrecht is a city with a bigger amount of female students.

Living situation

42,6% of the respondents live in Utrecht and 57,4% doesn't live in Utrecht. This factor can influence how familiar they are with the routes and the chances they know the route. MBO students live at their parents place more often and less in the city of Utrecht. Secondly MBO students are often younger and don't get any student funding (their parent's get child support) that's why often they cannot afford to live on their own. WO students are more often living apart from their parents (80,3% in this sample) and mainly in the city of Utrecht. The living environment might influence cycling behaviour as someone cycles more often when they live in the city than when they don't (high density means more cycling). Furthermore it can influence whether they are familiar with the routes which are filmed in Utrecht.

Bicycle use

In the sample the biggest part of the students own a bike (95,2%). Most of the students are frequent cyclists (65,1% cycles 4 or more times a week, and 7,9% 1-3 times a week). It is possible to see whether there is a notable difference between educational level and cycling frequency, from the literature this can be expected. To view this connection a cross tabulation is made and a Chi² test is performed, the crosstab shows that at the MBO level 41,7% of the respondents is a non-frequent cyclist whilst at University level only 5% is a non-frequent cyclist. The Chi² test shows a significant (sig 0,021) difference between the educational level and cycling habit.

Cycling factors

Before starting the route related questions respondents were asked to fill in what they deem important during a cycling trip. They were questioned nine aspects which can be divided into the five main categories. The respondent could fill in whether they thought this aspect was very unimportant (1) to very important (5). From the means of these outcomes it appears that the respondents rated the traffic situation most important (4, important) this is in line with the hierarchy of needs, in which safety is most important as well as functionality. Followed by the visual heterogeneity (3,58) and a green environment (3,47). Factors that appeared to be least important are the availability of shops and offices, the mixed use construct altogether was rated an average of 2,70 which is unimportant to neutral.

4.3 Reliability analysis

After watching each video the respondents had to rate each of the 5 aspects again through different Likert-scale constructs. The constructs, which are briefly described in chapter 3, consist of five to seven statements about different aspects of the category. All items have been rated by 40 to 42 respondents. These constructs are tested with a reliability analysis whether the items measure different aspects of the same thing, to measure whether there is correlation between the items a Cronbach's Alpha is calculated. Each route consists of 5 constructs, and all the constructs for each route are analysed.

<u>Construct 1 – Functional aspects</u>

The first reliability analysis is performed on the construct 'Functional aspects'. Before analysis the coding of two questions is reversed, since stressful and busy are negative statements (reversed wording). After this the Cronbach's Alpha calculation is performed. A weak consistency is found between the different items, (route 1 Cronbach's Alpha: 0,559 = poor reliability). This is due to the fact that multiple aspects of the functional environment are questioned, for instance safety as well as comfort of pavements. The concept is overarching too many different aspects of the functional environment, the different aspects are used separately in the analysis.

<u>Construct 2 –Built Environment</u>

For the architecture construct a reliability analysis is performed on six items. This analysis shows acceptable consistency for all six routes, the Cronbach's Alpha ranges between 0,729 and 0,876 which means acceptable to good reliability. Furthermore, it is checked whether the reliability could be improved by removing an item, however improvement in one route would lead to deterioration in another. All items are preserved to keep as much data in the analysis as possible. The difference between an acceptable and good reliability between the routes could be due to the fact that some routes are rated in a more divergent way than others. The construct for the built environment is used for further analysis and is calculated into one new variable (mean) which represents the construct.

Construct 3 – Green

For the green construct a reliability analysis is performed on seven items. This analysis shows good consistency for all six routes, the Cronbach's Alpha ranges between 0,830 and 0,894 which means a good reliability. The construct 'green' is used for further testing and is calculated into one new variable which represents the construct.

Construct 4 – Mixed-use

For the Mixed-use construct a reliability analysis is performed on seven items. This analysis shows good consistency for all six routes, the Cronbach's Alpha ranges between 0,814 and 0,899 which means good to almost excellent reliability. The construct 'mixed-use' is used for further testing and is calculated into one new variable which represents the construct.

Construct 5 – Visual heterogeneity

The visual construct is also tested with a reliability analysis on the six items. This analysis shows that route 4 (Rijnsweerd) has an unacceptable consistency between the six items, with a Cronbach's Alpha of 0,312. After removing the inconsistent item 'peacefulness' the Cronbach's Alpha is 0,760 which is acceptable consistency. After removing the item the Cronbach's Alpha of the construct for all six routes ranges between 0,607 and 0,807 which means a questionable to good reliability. Route 2 and 3 both show a questionable reliability, with little correlation between the items 'curiousness' and 'variably'. For these routes these items have a little contribution to the Likert-scale, and is the construct more unstable.

Table 4.3.1: Cronbach's Alpha, construct 2-4.

Construct	2: Built environment	3: Green	4: Mixed-use	5: Visual Heterogeneity
Route 1	0,845	0,873	0,887	0,766
Route 2	0,876	0,830	0,817	0,649
Route 3	0,865	0,888	0,814	0,607
Route 4	0,750	0,894	0,899	0,760
Route 5	0,729	0,842	0,830	0,807
Route 6	0,802	0,891	0,837	0,769

5. Analysis

In this analysis chapter first the hypotheses are tested per route, to see how all the different environmental and time related aspects impact the outcomes of the cycling experience. After this, the data set has been restructured to view how the different constructs impact the total appreciation of the environment and the feelings of time for all six routes together. These two different perspectives on testing the hypotheses help answering the research questions resulting in one overall conclusion.

5.1 Environmental aspects per route

To answer hypotheses 1 to 5 *(H1: More appreciation of functional aspects means a higher appreciation of the route; H2: More appreciation of the built environment means a higher appreciation of the route; H3: More appreciation of the green along the route means a higher appreciation of the route; H4: More appreciation of mixed use means a higher appreciation of the route; H5: More appreciation of the visual heterogeneity means higher appreciation of the route)* the different aspects are calculated to see what effect they have on the total appreciation of the route for each route. First to answer these questions it is important to review the overall ratings of all the routes and compare them to one-another to see whether there are big differences. After this for each route a multiple regression analysis is performed to see what the expected influence of each variable on the grade given to each route is.

For the multiple regression analysis the variables in the model are based on the expected influences resulting from the theoretical framework. Based on this it is decided to include 17 variables in the model. First the individual, social and cultural factors, these are fairly limited in this research. The cycling habit is a dummy variable No (0)/ Yes (1): as well as: Cycling frequency up to once a week (0)/ more than once a week (1), gender male(0) /female (1), age (years), living in Utrecht dummy No (0) / Yes(1) , education dummy MBO (0)/ HBO&WO (1), Culturally Dutch No(0) /Yes (1), Familiar with the route No (0) / Yes (1). Besides these personal aspects there are the ratings the respondent gave to the statements on the route on a scale from 1 (Strongly disagree) to 5 (Strongly Agree). This rating exists for 6 functional aspects (Safety, Road quality, NoStress, NotBusy, Comfort and Traffic flow) as well for four main visual constructs: built environment, green, mixed-use, visual heterogeneity (4.3). The multiple regression for each route shows what influences the respondents in giving a grade for each route, each route is graded at least 40 times (dependent variable).

Route 1 – Binnenstad

About 64% of the respondents knows this route (partially), but more than half of these respondents never cycle this route. 11% cycles this route monthly, 6% weekly and 3% on a daily basis. People who live in Utrecht are more familiar with the route than people who don't. Route 1 has an average grade of a 6,5 and the total judgement is neutral to positive, which is in line with the grade given. Most questions regarding the functional aspects are rated neutral. Safety, quality of roads, comfort and traffic flow are aspects which aren't judged positively. Most respondents say the route is safe (35,7 %) or neutral (33,3%) however 12 respondents believe the route is not safe (28,6%). On average the respondents believe the safety of this route is neutral. The same counts for the quality of the roads, however more people tend to see the route as uncomfortable. The route isn't experienced as stressful, however the outcomes are divergent, this is also the case for busyness.

When it comes to the different constructs they are all rated fairly good, best rated is mixed-use (3,55) which is expected since there is a lot of mixed use and richness of activities in the inner-city. The built environment (3,3) and visual heterogeneity (3,2) are seen as neutral to positive. Which is expected since the inner-city contains historic and unique sights as well as small building blocks and bending roads. Green is more negatively rated, this is in line with the inner-city aspects since this route only contains some trees but no green areas.

Multiple Regression

For route 1 the ANOVA table shows the F-test (4,650): the model is significant at the 0,000 (≤0,005) level. The coefficient of determination: R Square is 0,782 which means that 78,2% of the variance of the route 1 grade is explained by the 17 variables in this model. The presuppositions are met by the model (normality, linearity as well as homoscedasticity).

The partial regression coefficients show what influence the variable has on Y. Looking at the individual variables in the model (mean) visual heterogeneity is significant with 0,006. It has the highest Beta (0,700) which means relatively it has the most influence on the dependent variable (grade). The B is 1,420 which means when the mean visual heterogeneity increases the grade increases as well. This is in line with the idea of the route with a lot of bends, switching views and small building blocks, and has a significant impact on route grade.

Next to this partial regression coefficient, the stressfulness of the route shows a significant (sig 0,044≤0,05) relation to the grade given to route 1. It has relatively less influence than visual heterogeneity (Beta 0.370), less stress means a better grade for the route (B= 0,509). Stressfulness might be related to the fact that there is more traffic and more happening in the inner-city resulting in more inputs, which makes the stressfulness of the route very different for each respondent. When a respondent feels there is little stress he is more likely to give the route a higher grade. Of the other partial coefficients in the regression three variables show a significance at the 0,10 level, which means the chance is 90% that they explain part of the variance of the grade for route 1. This is the case for age (Sig 0,054, B:0,177), green (Sig 0,065; B:0,508), traffic flow (0,068; B:0,538).Green is the lowest rated construct for route 1, however when someone likes the green in the route they are more likely to give a higher grade, this could be important in the inner-city due to the fact that it does not have a lot of green. When traffic flow is rated better the respondent gives the route a higher grade. On average older respondents rate the route better.

Route 2 - Overvecht

About 29% of the respondents know the route (partially), but 85,7% of this group never cycles this route. Only one person cycles this route monthly and one person weekly. So this route is not known in the sample group. Route 2 has a mean grade of 5,8 and the total rating is negative (29%) to neutral (65%). 41,5% believes the route is safe and the quality of the routes is good (53,7%). Most people think the route is neutral to not stressful however over 66% of the respondents believe the route to be busy. They are neutral to positive about the comfort and flow of the route.

In the route most constructs are rated negative to neutral with the best rating for green (2,98, neutral) and the worst for built environment 2,47. However mixed-use and visual heterogeneity are also rated fairly negative (2,52 & 2,5). This is in line with the lowest overall mean grade of a 5,8. The buildings are all modern and high-rise with big building blocks, there is little mixed-use, however the area contains a lot of green.

Multiple Regression

For route 2 the ANOVA table shows the F-test (2,855): the model is significant 0,012 (≤0,005). The coefficient of determination: R Square is 0,698 which means that 69,8% of the variance of the route 2 grade is explained by the 17 variables in this model, this is slightly less than for route 1. The presuppositions are met by the model (normality, linearity as well as homoscedasticity).

The partial regression coefficients show what change the variable has on Y. When the individual variables in the model are viewed it seems that knowing the route (R2BekendDUM) is significant (sig=0,003) and relatively has the most influence (Beta) on the dependent variable (grade). The B is 1,448 which means when someone knows the route he is more likely to give a higher grade. This

could be due to the fact that these respondents already have an image of this route, for instance they have a positive association with the route, and already rated the route before watching the video. The built environment (R2Bebouw_mean) has an significant positive influence (Sig 0,029) on the grade of route 2. This could be due to the fact that the built environment of route 2 has the lowest overall rating (in line with the theory) however when a respondent rates the built environment better the overall grade is likely to be higher.

Besides these partial regression coefficients the stressfulness of the route shows a significant (Sig 0,045≤0,05) impact on the grade given to route 2. It has more impact (Beta 0,427), than the built environment (Beta 0,405) and less than knowing the route (Beta 0,582) less stress means a better grade for the route (B= 0,529). Of the other partial coefficients of the regression two variables show a significance at the 0,10 level, which means the chance is 90% that they explain part of the variance of the grade for route 1. This is the case for age (Sig 0,061) and visual heterogeneity (Sig 0,070) which both have an positive impact on the grade given (older = higher grade, higher mean_view = higher grade). Visual heterogeneity in the route is rated negative, probably due to the long straight roads and large building blocks, however when this aspects is rated more positive the grade is likely to be better.

Route 3 - Wilhelminapark

About half of the respondents know this route (partially) and the route is cycled quite frequently. 20% of the respondents who knows this route cycles this route daily and 28% on a weekly basis. The route is graded a 7,9 which is the highest grade of all the routes, the respondents judge the route positive (61%) to very positive (36%). The route is viewed as safe (68,3%) and has a good road quality (75,6) and comfort (63,4). Only 3 respondents view the route as stressful however a few more feel the route is busy (24,4%).

All the constructs in the route are rated positive, green is rated most positive with a mean of 4,19 (positive to very positive), this could be due to the fact that the route is very green and passes through a park. All the other aspects have a positive rating. The built environment received a 3,88, in this route the built environment contains a lot of mansions and nice town houses. These ratings are in line with the fact that the route has the best rating in general.

Multiple Regression

The ANOVA table shows the multiple regression model for route 3 is significant (0,043 ≤0,05). The coefficient of determination: R Square is 0,641 which means that 64,1% of the variance of the route 3 grade is explained by the 17 variables in this model, this is slightly less than for route 1&2.

The partial regression coefficients show what influence the variable has on Y. Looking at the individual variables in the model it shows that cycling frequency has a significant impact on the grade of the route (Sig 0,003) when someone cycles frequently (more than once a week) he is more likely to give a higher grade to route 3. Cycling frequency has the most relative impact of all the partial regression coefficients (Beta 0,619). When a respondent cycles more frequently functional aspects become less important and the respondent has more time to view the visual aspects of the environment, this could partially explain why these respondents give a better grade to the greenest and highest rated route.

Green has a significant impact on the overall grade of route 3 (sig 0,034), this means that when someone rates the green environment in route 3 higher this respondent is more likely to give the route a higher grade. This route contains a lot of green, when someone really appreciates this green this respondent is more likely to give a higher grade. There is one variable that has a significant impact with 90% certainty which is living in Utrecht. This variable shows that when someone lives in Utrecht (1) this respondent is more likely to give a higher mark to route 3 (B=0,940).

Route 4 - Rijnsweerd

Over 60% of the respondents is familiar with the route, of these respondents 15% cycles the route on a daily base and 45% never cycles the route. The mean grade is a 6,9. The biggest share of the respondents say the route is safe and the road quality, comfort and traffic flow are good. This route has a wide separate cycling lane which can explain these ratings. However some people experience the route to be busy and a few feel it's stressful.

Of the different aspects green gets the best judgement (mean 3,5) whilst the built environment, visual heterogeneity and mixed-use get low judgements. This is in line with the aspects of this route. The environment is green and has a lot of trees and green separating the road and the cycling lane. However the buildings are all modern office buildings and the road is long and straight so the view doesn't change a lot, which means low mixed-use and a monotone view.

Multiple Regression

The multiple regression model for route 4 is significant 0,005 and explains the variance of grade for route 4 with 74,6%. The presuppositions are met by the model (normality, linearity as well as homoscedasticity).

It only has variables which are significant at the 90% level. Which are education, living in Utrecht and visual heterogeneity. Both living in Utrecht and educational level have a negative impact on the grade given to the route. Regarding the route this could be due to the fact that this route is highly associated with studying HBO and University (the route passes by the Daltonlaan and leads to the Uithof), people living in Utrecht probably have more of this negative association of cycling this route to their studies. Visual heterogeneity has a slightly positive impact on the grade (B=0,546). Which means that when the respondent appreciates the visual heterogeneity the grade rises. However as noted before the mean of visual heterogeneity of this route is low, this could explain the impact of this variable.

Route 5 - Tuinwijk

82,9% of the sample does not know this route, of the respondents who do know the route only a few actually cycle the route. The route received an average grade of 6,7 and has a neutral (43%) to positive (46%) rating. The route is seen as safe, only one respondent feels the route is unsafe. Regarding comfort and road quality the ratings are more divergent which results in a more neutral rating. The route isn't stressful nor busy and the flow is good. However the responses are really differentiated.

Green in this route has been rated best (3,5 mean) followed with the built environment (3,2). This is in line with the environmental aspects since the neighbourhood had a lot of visible green and historical building styles. It has a lesser rating for mixed-use which was expected since this is a purely residential neighbourhood. However the visual heterogeneity is rated more negative (2,9) this was expected to be more positive because of the bends and changing views and green interspersed with short building blocks.

Multiple Regression

Route 5 shows a significant multiple regression model with a significance of 0,041 and explains the variance of grade for route 3 with 64,4%. The presuppositions are met by the model (normality, linearity as well as homoscedasticity). The model however shows no significant variables having either a negative or a positive impact on the average grade

Route 6 - Amsterdamsestraatweg

Over 85% of the respondents is familiar with route 6, but not a lot of respondents tend to actually cycle this route; 50% of the people who know this route never cycle the route. 25% cycles the route on a monthly basis, 10% weekly and 3% daily. The average grade for the route is a 6 and 34% rates the route positive and 29% neutral and negative. There are different conceptions of this route. There's a division in interpretations of safety on this route. Since 16 people define the route as unsafe, and 17 people believe the route to be safe. The quality of the roads is mostly rated positive and the comfort of the route neutral. The route is mostly judged as busy but not stressful.

Mixed-use in the route is judged best (3,18) this is in line with the characteristics of the route since this route contains a lot of mixed-use and this is visible in the richness of activities. The built environment (2,7) and visual heterogeneity (2,48) are judged to be more negative. Although a lot is happening in the route it is 1 long street with no bends, and the same building style (although historic) throughout which means these results were expected. Green is rated most negative (1,9) in this route almost no green is shown (some exceptional trees) so this is an expected outcome.

Multiple Regression

For route 6 the 17 variables in the multiple regression show a significance of 0,002 with an R-Square of 0,792 meaning that 79,2% of the variance of the grade of route six can be explained by this regression model. The presuppositions are met by the model (normality, linearity as well as homoscedasticity).

The model shows a significance for traffic flow (0,038) and built environment (0,006). Both show a positive impact on the grade given for the route. Overall the built environment of the Amsterdamse straatweg received a negative rating this could explain the importance of this factor in the regression, since if this rating becomes more positive the grade would become more positive too. The traffic flow of the route has a slightly smaller impact on the route.

Routes compared

The Amsterdamsestraatweg (route 6) is most familiar, Tuinwijk (route 4) is least known followed by Overvecht (2). When the routes are compared it becomes obvious that route 3 (Wilhelminapark) is rated best and route 2 (Overvecht) has the lowest rating. Wilhelminapark (route 3) has the highest mean for all 4 constructs. Route 6 scores the lowest green average and the lowest visual heterogeneity, this is expected since this route barely contains green and is just one long road. Route 2 scores the lowest on the built environment and mixed-use aspects. This is in line with the expectations since it is a modern high rise area with big building blocks and a purely residential area. With this it seems that all aspects rated positive result in a more positive average grade. The highest average for the four constructs however does not necessarily mean the highest total grade (table .. sorted by average grade). Route 4 received the second highest grade but resulted in the 4th highest construct mean.

Table 5.1: Routes Compared

	% knows route	Average grade	Built environment	Green	Mixed-use	Visual heterogeneity	Mean Constructs
Route 1	64	6,5	3,26	2,52	3,55	3,18	3,13
Route 2	29	5,8	2,48	2,98	2,53	2,50	2,62
Route 3	54	7,9	3,88	4,20	3,67	3,61	3,84
Route 4	64	6,9	2,94	3,46	2,86	2,61	2,97
Route 5	17	6,7	3,22	3,52	2,87	2,89	3,13
Route 6	86	6	2,72	1,89	3,19	2,48	2,57

5.2 Time and distance per route

In the survey each respondent was asked to fill in the expected time and expected distance for each route. The answers differed from 60 m to 15 km, and from 45 seconds to 50 minutes. This is very differentiated but in line with the theory that people don't really have any clue about actual time nor actual distance. In guessing these time the respondents might be irrational in making a statement that they felt like the research was lasting forever. It is possible that the interpretation of the question was wrong and that the respondent might associate the question with how they feel that this route would take if they were cycling it (adding to the route, or feeling like they would cycle more slowly). It might be the case that when people didn't fill in the survey seriously they had a less serious estimation of time and distance.

However the dissonance with feelings of time and estimated actual time could be related to the fact that people have a really bad sense of actual time (chapter 2.3.3). This is visible when the response to the question how many minutes did you think the video lasted is correlated with the question did you feel this route lasted 'very short – very long' (on a scale of 1 to 5). Correlation shows the strength and the direction of the relation between these two variables. If the correlation is measured: Spearman's Rho shows, a significant relation for route 1,2,3 and 5, all are positive moderate to strong correlation. The positive significant Spearman's Rho means that respondents who entered a high number of minutes also felt like the route lasted longer and people who entered a lower amount of minutes thought the route lasted shorter for 4 of the routes. However this relation is not significant in the case of route 4 and 6, the estimated time filled in in the survey and the feeling of time do not correlate.

Table 5.2.1: Spearman's Rho

	Correlation coefficient	Sig
Route 1	0,561	0,000
Route 2	0,498	0,001
Route 3	0,496	0,001
Route 4	0,102	0,520
Route 5	0,498	0,001
Route 6	0,208	0,199

In this case the variable feeling of duration will be used instead of estimation of time, since this ordinal variable is less sensitive for outliers and thus more reliable.

A shorter feeling of time watching the video means a higher appreciation of the route

For researching the relationship between the appreciation of the route and the feelings of time on the route 3 different variable can be used for each route. The variables: grade for the route, appreciation of the route and feeling of time. The relationship between the two variables is not linear and the feeling of time variable is an ordinal variable. This means that Spearman's correlation can be used to measure whether there is correlation between the two variables and what the direction of the relation is. This is tested for all six routes.

Route 1: First the correlation between feelings of time and the grade for the route is tested, the test shows a significance of 0.038. Which means that there's a significant relation with a strength -0,325. This means that there is a negative, weak to moderate correlation between the grade given and the feelings of duration. The negative relation means that when a higher grade is given the route duration felt shorter (and the other way around). The other way to measure the correlation is by not using the grades given but the appreciation of the route in a scale from very negative to very positive (1 to 5). The correlation shows a significance of 0,000 with a Spearman's Rho of -0,555, a moderately strong correlation.

Route 4: Shows a correlation between feelings of time and the grade for the route, the test shows a significance of 0,006. Which says that there's a significant relation with a strength -0,414. This means that there is a negative, moderate correlation between the grade given and the feelings of duration. The negative relation means that when a higher grade is given the route duration felt shorter (and the other way around). In the second correlation test using the appreciation of the route in a scale from very negative to very positive (1 to 5). The correlation shows a significance of 0,018 with a Spearman's Rho of -0,364, a weak to moderately strong correlation.

Route 2 + 3 + 5 + 6: Show no significant correlation in both cases.

Table 5.2.2: Correlation Feeling of time and Grade

	Correlation coefficient	Sig
Route 1	-0,325	0,038
Route 2	0,061	0,714
Route 3	-0,022	0,893
Route 4	-0,414	0,006
Route 5	-0,228	0,162
Route 6	-0,294	0,078

This is a mixed outcome since in two cases there is significant relation between feelings of time and appreciation of the route however for four routes this is not the case. There is another way to check this outcome. Since the questions are not only asked in a route related sense but also in comparing the routes, after seeing four routes. The respondent was asked to put the routes in order of time the route lasted (1 most to 4 least) and the order of attractiveness of the route (1 most to 4 least). In this variable the route which is experienced the longest is route 2 and the shortest route 3. The route which has the highest mean order of attractiveness is route 3 and the lowest route 2 (table 5.2.3). This is what theoretically is expected. However when this correlation is tested with the Spearman's Rho no significant correlation is found between the orders, while a negative relation is expected (a high position in experienced time means low attractiveness).

Table 5.2.3: Experienced time and Attractiveness

	Mean order Experienced time	Mean order Attractiveness	Order Exp. Time	Order Attractiveness
Route 1	2,08	2,79	5	2
Route 2	3,00	1,82	1	6
Route 3	1,94	3,53	6	1
Route 4	2,65	2,53	3	3
Route 5	2,91	2,22	2	4
Route 6	2,39	2,16	4	5

A Higher appreciation of the route means a shorter expected distance in the video

As noted before the reliability of the expected distance is questionable since the expected distances range from 10 m to 15 km. This implies that expected route length is sensitive for outliers and not a reliable variable. The question about distance has been answered 40 to 42 times per route. Every route has a mean estimated distance between 1416 m and 1955 which is not that far apart. All distances are estimated much longer than the actual distance which ranges between 665 and 792 meter. In all cases there is no significant correlation between the estimated length and the estimated duration of the routes. Because this variable is too sensitive for outliers the order of distance is the used variable for testing the relation between expected distance and route appreciation.

The order of distance is questioned at the end of the survey (1 is the shortest distance and 4 is the longest), for each route 35 to 37 people filled in this question. On average route 1 is regarded to have the shortest distance and route 2 the longest. Table 5.2.4 shows the mean order of attractiveness in comparing this to mean order of distance there seems to be no direct relation, no correlation is found, while a negative relationship is expected (a high position in experienced distance means low attractiveness).

Table 5.2.4: Distance and Attractiveness

	Mean Order Distance	Mean Order attractiveness
Route 1	2,03	2,79
Route 2	3,05	1,82
Route 3	2,09	3,53
Route 4	2,75	2,53
Route 5	2,40	2,22
Route 6	2,69	2,16

Theoretically perceived proximity gives an idea about how someone feels about the route and experiences the route, however in this research the measurement of feelings of time gives a better insight than estimated distance. All distances are overestimated in general, in this thesis estimated distance will no longer be used to measure perceived proximity. This however could've been possible when the distance was asked to be rated on a scale from 1 to 5/7/10 very short to very long. Or maybe in research which in addition measures experienced effort instead of only a visual experience of distance. The literature shows experienced time is a good indicator for traveling time experience that's why in this thesis this variable is used (instead of distance) to test the hypotheses for all routes.

5.3 Data restructuring

To check all hypotheses not just on their influence per route but all the different factors and the eventual grade given to a route or feeling of time estimated for a route a data transformation is necessary. In restructuring the dataset in SPSS making cases into variables. This restructuring will make a case of every route, now each respondent accounts for four cases. The dataset is restructured for 8 fixed variables, six variables from the multiple regression and the case and series number. In addition to this all 6 functional aspects the 4 constructs as well as grade and judgement, estimation of time/length and feeling of duration are restructured into the new variable groups. Lastly 6 dummy variables are made to represent each route in the multiple regression.

After the restructuring of the data set it is possible to test how the feeling of time, as well as the grade given to the different routes is impacted by the different independent variables in a regression model. Now all the hypotheses can be tested in two different regression models, one for route appreciation and one for experienced time.

Appreciation of the route:

The multiple regression model with the appreciation of the route by grade as dependent variable is significant with an R-Square of 0,650. Which means 65% of the eventual grade given to a route is explained by the 22 variables (5 dummies) in the model. These variables are the same 16 as in the previous regression models but now includes feelings of time and excludes culture, since it has not showed any significance in the previous model and only a small proportion of the respondents which is not culturally Dutch (a bigger group is necessary to test this significance). Five route dummies are added to the model. The presuppositions are met by the model (normality, linearity as well as homoscedasticity).

The model shows 8 significant variables impacting the eventual grade given. Of the social demographic factors gender is significant at 0,008 B= 0,338 which means that when the respondent is female she is more likely to give a higher grade for a route. Cycling frequency is significant (0,042) B=0,278 which means a respondent who cycles frequently is more likely to give a higher grade. These outcomes are in line with theories about cycling determinants and habit. When someone cycles more often it feels more appreciation for cycling in general and in this case also for the cycling environment

Of the route related variables knowing the route is significant (sig 0,010) B=0,0372 which means when someone knows the route this respondent is more likely to give a higher grade to the route. The variable of knowing the route is not significant when this is corrected for the different routes in the model represented by the dummies. This is because the knowing the route variable is related to the route.

The functional aspects show no significant variables, however comfort of the route is significant with 90% certainty (sig=0,056). If the respondents view the route to be more comfortable they are inclined to give the route a higher grade as well. This is in line with the expectations that functional aspects are only important when they are strikingly different, apparently the different routes differ more in level of comfort. For the other factors circumstances in the route are mostly equal, these aspects do not impact the grade given to the route significantly in this model.

From the different constructs the built environment (sig= 0,004), green (sig= 0,006) and visual heterogeneity (sig= 0,000) all three show a significant impact on the grade given to the route. Visual heterogeneity has the biggest relative impact (Beta= ,324) and has a positive impact on the eventual grade (B= 0,560) which means that when the appreciation of the visual heterogeneity is higher this means a higher grade is expected to be given to the route. The second biggest impact on grade is the green construct (Beta 0,213) which has a positive impact on the grade (B=0,294). Lastly the built environment has the third biggest overall positive impact on the grade given to the route.

The feelings of time during the route show a significant impact on the route (sig 0,026). The impact is a negative impact B= -0,173 this is the expected relationship that when a route feels like it lasts longer the appreciation of the route also drops.

The dummies of route 4 (sig=0,013) and route 6 (sig= 0,05) are both significantly different from route 2 (reference category) and there is a positive relation. This means there is a significant difference between the route viewed and the given grade, route 4 and route 6 on average received a higher grade than route 2.

Experienced time:

The second step is to check whether it is the case that the same influences affect the experienced travel time and whether the experienced time is influenced by the attractiveness of the physical environment. That's why the regression model is flipped, making feelings of duration (on a scale of 1 to 5 very short to very long) the dependent variable and the route grade an independent variable. The presuppositions are met by the model (normality, linearity as well as homoscedasticity).

This model is significant (ANOVA Sig 0,000), although the explained variance (R-Square) is only 21,7% which is fairly low. Significant factors are cycling frequency (sig: 0,012), road quality (sig: 0,019), Green (sig: 0,013) and route grade (sig: 0,026) this means that route grade thus impacts the feelings of duration the impact is negative as expected which means that when a respondent gives the route a higher grade this respondent also feels the route lasts less long (B= -0,139). Green, however, has a positive significant impact which means that when there is more appreciation for the green the route feels like it lasts longer. This is against the expectations that the route factors with a positive rating would make the route feel shorter, since this means there are positive incentives leading to optimal arousal. However it could be that green is peaceful and has low amenities resulting in boredom, or that the routes used in this research that have a lot of nice green feel long because of other factors not measured in this model.

The different routes (dummies) do not show a significant relation with the dependent variable (feelings of duration) in this model. With route 1 as reference category route 6 shows too much multicollinearity and is not included in the model.

However the explained variance (R-Square) of this model is lower than the model explaining the grade given to the environment. This means that there is more variance in the determinants of experienced cycling time than for route grades. This could be due to the fact that someone is asked to give a grade to the route after rating the different established components, it could be that in this case the respondent decides to define the grade based on the subjects previously rated. However the estimation of duration might be less influenced by these subjects.

When this model is performed with the estimation of time the route lasts the model does not fit the presuppositions of homoscedasticity as well as linearity. Unfortunately this variable is too unreliable to use.

5.4 Hypotheses

H1: More appreciation of the functional aspects means a higher appreciation of the route

The functional aspects as has been noted form the basis of the pyramid, these aspects have to be sufficient to be able to really focus on the visual aspects of a route. As has been noted before most respondents deem functional aspects to be the most important for a cycling route. For every route 6 questions about the functional aspects have been asked, these questions are as has been noted before not an overall construct but separate questions. This hypothesis is both described as well as tested through a multiple regression. After this it can be said that there is little to no influence of the functional aspects during the route on the eventual end-grade of the route.

This can be explained by the fact that most of the time the circumstances of the functional aspects were kept equal during the filming of the different video's (all were not too busy with sunshine and safe situations). However the comfort of the infrastructure and quality of the road as well as traffic flow did differ between the video's. The situations still slightly differ, that's why it is still visible in the different significance of influence per routes. In route 1 and 2 stressfulness is a significant factor, in route 1 and 6 traffic flow is a significant factor. Both these elements are harder to keep equal in all the video's and more open to different experiences of the respondents.

In the overall multiple regression for all routes it became clear that of all the functional aspects comfort is of a significant (90%) influence. Comfort is a factor which is noticeable when other circumstances (like safety) are good. In the video's it has been easy to detect comfort, for instance the image would be more shaky and the bicycle would make more noise. It is easy to view on video and thus easily noticeable for the respondent. More so than other functional aspects or feelings of stress which are more likely to happen in the situation. Which means this hypotheses only counts for the functional aspect of comfort and is thus rejected

It is found in the first part of this analysis chapter that people rate safety and infrastructure most important while riding their bicycle. The fact that the functional environment in general isn't significant to the appreciation of the cycling environment is expected. In the literature it has been found that the conditions in the Netherlands most of the time are so good that cyclists have the time to view the aesthetics and attractiveness of their surroundings making the visual part of the route more important (Stefansdottir, 2014; Spinney, 2007; Heinen, 2009). That's why the conditions regarding functional aspects as well as weather in this research are kept neutral. So now the aesthetic and attractive parts of the cycling route can be viewed more extensively

H2: More appreciation of the built environment means a higher appreciation of the route

The built environment is expected to influence the visual experience and enhance the appreciation of a cycling environment. From the theory it follows that historic and unique sights, but also differentiated and short blocks and maintenance are important factors when it comes to the built environment (Pikora et al. 2003; Jacobs, 1961; Gehl & Svarre, 2013). For two routes the built environment shows a significant impact namely route 2: Overvecht and route 6: Amsterdamsestraatweg, in both routes the built environment is a less attractive and overall monotone environment. Both show the lowest mean built environment rating, it is not surprising that in these two cases the appreciation of the built environment has an impact on the overall grade.

The built environment shows a significant impact over all routes on the eventual grade of a route. This visual aspect was expected to increase the appreciation of the route when the appreciation of this aspect increases. This hypotheses is accepted with a significant of 0,003.

H3: More appreciation of the green along the route means a higher appreciation of the route

Green shows a significant influence for route 1 and 3. Route 1 has the highest score of green and route 2 the second lowest. It is expected that in a route with a lot of green the appreciation of this green has a significant influence on the total appreciation of the route. In route 1 green might be significant because of the fact that when respondents do appreciate the small amount of inner-city green they are more likely to give a higher grade to the route.

The overall green construct is significant in the grading of all routes (Sig 0,000) and has the second highest impact on the eventual route appreciation by grade. Green was expected to have a positive impact when appreciated, when a respondent has the time to visually experience green he is more likely to have a positive experience of the route. Thus this hypotheses is accepted.

H4: More appreciation of mixed use means a higher appreciation of the route

The mixed use concept is a hard concept to measure when it comes to route experience and appreciation. In all the routes the mixed-use factor does not show a significant impact. However in the descriptive part of the route it becomes obvious that the mixed use rating really differs in the mean mixed use appreciation. Mixed-use in visual experience is mostly visible in the built environment. The survey mostly focused on this factor but not really on the richness of activities resulting from mixed use which is more a social experience. In this research the mixed-use aspect is not significant and H4 is rejected.

H5: More appreciation of the visual heterogeneity along the route means higher appreciation of the route

Visual heterogeneity is significant for route 1, 2 and 4 in the total appreciation of the route. In route 2 there is a lot of visual heterogeneity and in route 2 and 4 little however in all three routes it is a significance at the 90 percent level. It becomes clear that more appreciation of the visual heterogeneity in these routes results in a better mark for the route. This is also found in the overall multiple regression which shows the biggest relative impact of visual heterogeneity on the overall route appreciation with a 0,000 significance. This hypotheses thus is accepted.

H6: A shorter feeling of time watching the video means a higher appreciation of the route

When reviewing correlations between feeling of duration and appreciation of the route this is found for route 1 and 4. In an overall multiple regression model the negative relation between feelings of time and route appreciation is found. With a significance of 0,025 there is a negative relationship which means that when the respondent feels a route lasts longer this respondent is more likely to appreciate the video less. This means hypotheses 6 is accepted.

Unfortunately the data of estimated length and estimated time are too unstable to find a clear relationship with the appreciation of the rout. This could be due to the fact that estimating length is too hard while watching a video since there is no experienced effort.

H7: More appreciation means shorter feeling of time watching the video of the route

In the regression model the feeling of time is viewed as a grade from one to 5 which can be influenced by all the different variables. It is tested whether the grade given to the route, which implies the experienced appreciation of the route, impacts the experienced duration of the route. This multiple regression model shows route appreciation has a significant negative impact on the feelings of duration of the route. However the model only has an explained variance of 21,7% which means there are more explanatory factors needed for feelings of time than tested in this research.

6. Conclusion and discussion

This thesis focused on cycling and how stimulating cycling can have a lot of benefits for both the individual and for society. Cycling frequency declines when teenagers become young adults. Therefore this research tried to find out what can trigger urban cycling behaviour for youth studying in Utrecht. In this thesis the focus was put on the experience and attractiveness of the physical environment, more than the functional aspects of the environment resulting in answering the main question:

To what extent does (the attractiveness of) the physical environment influence the urban cycling experience of youth studying in Utrecht?

This question is based on existing research, which observed that cycling behaviour has different determinants, namely individual, cultural and social factors (Vanderbulcke et al, 2008). In line with the theory of planned behaviour these factors influence cycling attitudes and behaviour (Heinen, 2011). These attitudes and behaviour however are also influenced by the physical environment, which has been found to influence behaviour (Lenthe et. al., 2005; Kaczynski and Henderson, 2007; Bakker et al., 2011; Pikora et al., 2003). Mostly based in neighbourhood (geography) and health related research, physical incentives of behaviour have been researched. This literature noted the experience (of the physical environment) to be of influence on behaviour however is inconclusive about this, therefore more research on the cycling experience is needed.

Other theories based on 'new mobilities theory' and theories about meanings and perceptions of space, suggest that someone's experience of an environment influences behaviour (Duppen, 2011; Harms et al., 2007; Duppen and Spierings, 2013; Degen et al., 2008; Heinen, 2009; Hagen et al., 2012). This is in line with the 'experience society' discourse, which believes that experience is important in decision making processes (Jacobs, 2006; 2011). Experience can be viewed in a lot of different ways and can be embodied. Visual experience is an important part of this embodiment and is central in this thesis (Duppen and Spierings, 2013; Degen et al., 2008). The reason is that a cyclist has a lot of visual inputs of his environment. The impressions a cyclist experiences in his trip influence the way he experiences time and distance (Heinen, 2009; Duppen and Spierings, 2013; Hagen et al., 2012; Jacobs, 2011).

This research used videos to show respondents different routes with different aspects. In statement the respondent is asked whether he deems a route aspect to be either positive of negative. All respondents are showed the same 4 out of 6 videos, in this way it is possible to compare the outcomes and see what aspects are deemed most important to influence the eventual appreciation someone has for a route. This rating is part of the experience of the respondent, and shows whether this is a negative or positive experience.

6.1 Research Question 1

Which physical aspects influence the cycling experience of youth studying in Utrecht and what influence do they have?

The cycling environment comprises different aspects, functional aspects, which are necessary to enable cycling as well as natural aspects (which are fixed), but also aesthetic aspects which can be visually observed by the cyclist. The aesthetic environment has been found to influence someone's experience and is feasible to modify. That's why it is interesting to see which aspects in the aesthetic environment are important for the cycling experience. Up to now no clear physical aspects are defined and the extent to which they influence the experience of cycling is unclear, although there are some ideas and suggestions originating in other research (Pikora et. Al. 2003, Lenthe et. al., 2005; Kaczynski and Henderson, 2007; Bakker et al., 2011; Jacobs, 1961; Gehl & Svarre, 2013; Duppen & Spierings, 2013; Stefansdottir, 2014). A conceptual model is derived from these ideas and

subsequently a scheme of possible characteristics which influence the physical environment is specified. The five possible characteristic groups: the functional environment, the built environment, green, mixed-use and visual heterogeneity are defined and their influence on the cycling experience is tested.

In the survey the respondents were asked to fill in questions about the importance of different aspects during the route, before watching the videos. The aspect rated to be most essential by the respondents is the traffic situation, which is in line with the ideas of the pyramid of needs that defines the functional environment as a basic need and is considered more important than the aesthetic environment (Stefansdottir, 2014). This is followed by visual heterogeneity, green and the built environment. The mixed-use aspect emerged as least important.

This is in line with the outcome of all hypotheses tested, based on what the respondents eventually experienced during the route. Of the functional aspects only comfort shows a significant influence on the experience, this could be due to the fact that the level of comfort still differs between the routes viewed whilst all other functional aspects were kept neutral and positive to the respondent (e.g. no dangerous situation, no long waits, no busy crossings). In the routes viewed functional aspects do not significantly influence route appreciation of the respondent.

The built environment, green and visual heterogeneity are all significant positive influences on the appreciation of a route, which means these aspects affect the cycling experience of the respondents. When these aspects are rated positively the respondent will have a more positive route experience. However mixed-use does not show a significant relation with the cycling experience. This could be due to the fact that the positive outcomes of mixed-use are mostly expected to be observed in the richness of activities. In most research mixed-use is seen as a functional destination related variable (Pikora et al., 2003), however the predicted positive effect is mostly assumed to be a social outcome (Jacobs, 1961, Duppen & Spierings 2013). However, this is hard to measure with this visual research. This research has not focused enough on social circumstances in the experience, more on visual route aspects, which could explain why mixed-use does not have a significant influence on the cycling experience. Moreover social circumstances are more sensitive to different experiences and maybe harder to measure in quantitative research. All the other visual aspects defined however do have a significant positive relation. In line with expectations based on the literature.

6.2 Research Question 2

To what extent does the attractiveness of the physical environment influence the travel time experience of youth studying in Utrecht?

The attractiveness of the physical environment is expected to influence travel time experience, this idea is based on the theory of Berlyne. Optimal arousal is found in time with high amenities, this results in the expectation that when an environment is attractive this results in a shorter feeling of travel time (Hagen et al. 2012; Jacobs, 2011). Different literature believes that cycling on boring/dangerous/stressfull roads results in a longer perceived proximity/ experienced time and effort (Heinen, 2009; Duppen en Spierings, 2013; Hagen et al. 2012; Jacobs, 2011). The overall attractiveness of the physical environment has been measured with the appreciation of the route in grade (1 to 10) as well as the 5 different aspects of the physical environment defined in this research. However these features only partially explain the experienced travel time. The low explained variance in the model means there are other factors involved in explaining feelings of time in a route which are not tested in this research.

The experienced travel time is only tested in feelings of duration, this ordinal variable has been used since the estimation of actual time variable as well as the variable for estimated distance (perceived proximity) were too sensitive for outliers and thus too unreliable to use in the testing. The estimations of time and distance by the respondents, are very far apart and sometimes even unrealistic. The expected connection related to perceived proximity, is only measured in experienced time on an ordinal scale, the method of video research used does not seem fit to measure an estimated distance. This results in the fact that only part of perceived proximity and experienced travel time is actually tested in this research. This is in line with Hagen et al. 2012 who believe that people experience time very differently and don't have a clue about actual time. That's why it would be suggested for future research to not ask for estimations of distance but maybe feelings of distance of an ordinal scale.

6.3 Research Question 3

To what extent does the attractiveness of the physical environment and the travel time experience improve the cycling experience of youth studying in Utrecht?

When the physical environment is rated to be attractive on three different constructs the cycling experience is more positive. This is mostly visible when viewing the routes separately. If all the aspects are rated better the entire experience improves. For instance in Wilhelminapark this is shown in the fact that the highest rating of all constructs (together) correspondingly account for the best experience (in grade). All routes separately show different significant aspects in what defines this route to be more positively graded or more negatively. This means that in some routes one physical environmental aspect is more important and striking than in others, depending on the different aspects of the route. The subjective experience of this aspect is very different; although the amount of visible green in one route is the same, the experience of this green and it's different aspects are different amongst the respondents. The significant outcomes of the regression are mostly in line with the ideas on which the selection of the route has been based. For instance in Overvecht the built environment turns out to be of a significant impact, and has the lowest rating. This was expected since this area mostly consist of a functional architecture, with high rise in the green and large building blocks which are similar and no mixed-use.

The attractiveness also influences the experienced travel time of the route. However this is only observed in feelings of duration, since in this research this variable is viewed as the only reliable not too sensitive for outliers. The experienced time has a significant influence on the overall appreciation for a route. This means that when someone believes a route lasts shorter this person is also inclined to have a better experience during the route. This is in line with the ideas of Heinen, 2009; Duppen en Spierings, 2013; Hagen et al. 2012; Jacobs, 2011 that experiences of time are related to appreciation of an environment and the cycling experience. When the route feels shorter this can alter the appreciation of a route and result in a more positive experience. It is clear that both the attractiveness of the physical environment, measured in four aesthetic aspects, as well as the experienced time improve the cycling experience of a route. When physical aspects are experienced more positive the route appreciation is higher. When a route is experienced shorter the route experience and appreciation of the route is more positive.

From this research it could be said that the physical environment definitely influences the cycling experience. The attractiveness of the environment measured in functional and aesthetic aspects has an influence on how the route is appreciated. With the different functional circumstances kept as neutral as possible the visual effects became clear in the appreciation of the built environment, the visible green and the visual heterogeneity. These all have an effect on the overall cycling experience, however the effect on the perceived proximity is questionable based on this research and needs more research.

6.4 Discussion & Recommendations

The video research was very experimental and on a small scale. Therefore, the outcomes of this research are only applicable to the respondents in the sample and an indicator for youth studying in Utrecht. To say something about the Dutch population (or Utrecht population) a bigger stratified sample is needed.

For future research using route video footage, it could be advisable to shorten the time of the total research or a shown video/route. This possibly will help with the attentiveness of the respondents and in addition the effort and seriousness invested in answering the questions. 2,5 minutes for each video might have been too long, however this depends on what route aspects have to be shown, and what effects are researched. Especially when it comes to visual heterogeneity, perceived proximity and experienced time it was important in this research to make the routes longer, however this resulted in unrealistic estimations of time and distance and sometimes distracted respondents.

With this study the effect of perceptions and estimations of time and distance are hard to measure. This resulted in unreliable data and loss of data for testing the different hypotheses. During the research it was noticeable that respondents had a hard time estimating distance, and while turning the surveys into the data set it was noticeable that a lot of answers regarding these questions were unreasonable. This could be due to the fact that the participating students took the survey too light-hearted and did not seriously think about their answers, maybe because it was too hard to think of a serious answer. Different questions and tests could be more sufficient like grading the time and distance on a ten point scale and maybe put more focus on this topic in different research. It might be the case that in this experimental video research it is possible to measure the effect of the physical environment visually, but that video is not the right way to measure time and mostly distance perceptions. Furthermore the experienced time is expected to be explained by other factors not incorporated in this research, it is advisable to do more investigations trying to find other factors influencing the experience of travel time while cycling.

In measuring the mixed-use aspects just focusing statements on the visual experience is not enough, to measure an experience regarding mixed-use it might be necessary to involve social circumstances. The richness of activities as resulting from mixed-use is more important to measure. For future research it is advisable to give more attention to this factor, and put more focus on social circumstances.

This research shows that adapting a cycling environment goes beyond functional aspects, it influences the cycling experience. This experience is important to take into account in planning new routes and roads, since building a cycling highway does not effectively mean attracting all the cyclists to choose the newer faster road. A lot of aspects in the cycling experience play a role in this decision making process and should be taken into account in planning. When new ideas and roads are implemented it could be important to look at the effects when it comes to the experience of this new route. A planning department should take this into account and focus more on amenities during the trip on the newly planned route, and how these could be experienced. This way it can be realized that a new route is not only more effective but also more attractive and helps to make cycling more attractive.

7. Literature

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8. Appendix

8.1 Quote in Dutch 2.3.2:

"Fietsers hebben een eigen praktijklogica. Onder het plein voor de Universiteitsbibliotheek is bijvoorbeeld een prachtige fietskelder gemaakt. Toch wemelt het op de Drift van de fietsen. Een fiets parkeer je zo dicht mogelijk bij de plaats van bestemming, naast de deur. Dat is een wetmatigheid. Ook in de spits pakt de fietser zijn plek. In bossen stuiven fietsers de Wittevrouwenstraat in, wriemelen tussen de auto's door en weten een plek vóór de auto te bemachtigen waardoor de auto's stapvoets erachter aan rijden. Gaat goed." …… *"Waarom dan de hele route met nieuw rood asfalt bedekken en het obstakel Spinozabrug het hoofd bieden met een tunnel ter waarde van drie miljoen euro? En dat is dan nog maar één route. Ook door het Wilhelminapark, de Springweg, de Herenstraat, de Leidseweg, de Voorstraat komen hoofdfietsroutes. In de Prins Hendriklaan ligt al rood asfalt. De fietsstraat is een zware ingreep, vergelijkbaar met een busbaan of een wandelstraat in een winkelgebied. Het is een uiting van het masterplandenken."* (Orthel, 2013)

8.2 Survey 3.4:

Enquête: Serie:

Universiteit Utrecht

Enquête fietsbeleving jongeren

Beste student,

Graag nodigen wij je uit om deel te nemen aan ons onderzoek omtrent fietsbeleving van studenten. Met deze enquête willen wij de manier waarop je de omgeving waarin je fiets ervaart meten. Je kunt hierbij denken aan de groenvoorzieningen, de verandering van het uitzicht en de aanwezigheid van onder andere winkels en cafés. Het onderzoek zal bestaan uit een aantal korte vragenlijsten en een aantal korte video's. Dit onderzoek is van belang voor het afronden van onze master Urban Geography aan de Universiteit Utrecht.

Je medewerking aan de enquête wordt door ons zeer gewaardeerd. Het kost je ongeveer 25 minuten om de video's te bekijken en de enquête in te vullen. Bij elke vraag is slechts één antwoord mogelijk, tenzij anders aangegeven.

Deze enquête is anoniem en wij zullen de informatie uit dit onderzoek vertrouwelijk behandelen.

Bij voorbaat danken wij je voor je medewerking!

Meike en Sanne

1	**Kruis het vakje aan (één antwoord mogelijk)**	
1.1	Heb je beschikking over een fiets?	0 Ja 0 Nee
1.2	Hoe vaak maak je gemiddeld gebruik van de fiets?	0 Nooit 0 Ongeveer 1 keer per maand 0 Ongeveer 1 keer per week 0 Tot 3 keer per week 0 Meer dan 4 keer per week
1.3	Hoe vaak maak je gemiddeld gebruik van openbaar vervoer binnen de stad Utrecht?	0 Nooit 0 Ongeveer 1 keer per maand 0 Ongeveer 1 keer per week 0 Tot 3 keer per week 0 Meer dan 4 keer per week
1.4	Heb je een ov-studentenkaart of een ander (betaald) reisproduct?	0 Ja, een ov-studentenkaart 0 Ja, een ander reisproduct, namelijk… 0 Nee
1.5	Heb je een rijbewijs?	0 Ja 0 Nee (ga door naar vraag 2)
1.6	Heb je beschikking over een auto?	0 Ja 0 Nee (ga door naar vraag 2)
1.7	Hoe vaak maak je gemiddeld gebruik van de auto?	0 Nooit 0 Ongeveer 1 keer per maand 0 Ongeveer 1 keer per week 0 Tot 3 keer per week 0 Meer dan 4 keer per week

2	**Kruis het vakje aan welke het meest van toepassing is (één antwoord mogelijk)**						
	Van welk vervoersmiddel maak je het meest gebruik op weg naar de volgende activiteiten?	Wandelen	Fiets	Auto	Openbaar vervoer	Anders	Niet van toepassing
2.2	Studie	0	0	0	0	0	0
2.3	Werk	0	0	0	0	0	0
2.4	Boodschappen	0	0	0	0	0	0
2.5	Winkelen	0	0	0	0	0	0
2.6	Uitgaan	0	0	0	0	0	0
2.7	Sport	0	0	0	0	0	0
2.8	Vrije tijd anders	0	0	0	0	0	0

3	**Kruis het vakje aan welke het meest van toepassing is (één antwoord mogelijk)**						
	Geef voor de volgende activiteiten aan op welke afstand ze van je huis zijn (denk hierbij aan de meest voorkomende locatie)	< 2,5 km	2,5 - 5 km	5 - 7,5 km	7,5 - 10 km	> 10 km	Niet van toepassing
3.1	Studie	0	0	0	0	0	0
3.2	Werk	0	0	0	0	0	0
3.3	Boodschappen	0	0	0	0	0	0
3.4	Winkelen	0	0	0	0	0	0
3.5	Uitgaan	0	0	0	0	0	0
3.6	Sport	0	0	0	0	0	0
3.7	Vrije tijd anders	0	0	0	0	0	0

Vul ook de vragen op de achterzijde van deze pagina in.

4	**Kruis het vakje aan welke het meest van toepassing is (één antwoord mogelijk)**

	Geef aan welke onderdelen van de omgeving je belangrijk vindt tijdens het fietsen	Geheel onbelangrijk	Onbelangrijk	Neutraal	Belangrijk	Zeer belangrijk
4.1	Verkeerssituatie	0	0	0	0	0
4.2	Bebouwing	0	0	0	0	0
4.3	Groenvoorziening	0	0	0	0	0
4.4	Aanwezigheid van winkels	0	0	0	0	0
4.5	Aanwezigheid van cafés	0	0	0	0	0
4.6	Aanwezigheid van woningen	0	0	0	0	0
4.7	Aanwezigheid van kantoren	0	0	0	0	0
4.8	Afwisseling in de route	0	0	0	0	0
4.9	Afwisseling in het uitzicht	0	0	0	0	0

Sla de pagina nog niet om!

Je krijgt eerst een video te zien. Vervolg daarna de vragenlijst

5	**Kruis het vakje aan (één antwoord mogelijk)**	
5.1	Ik ben bekend met deze route	0 Ja 0 Gedeeltelijk 0 Nee (ga door naar vraag 6)
5.2	Hoe vaak fiets je (een deel van) deze route?	0 Nooit 0 Maandelijks 0 Wekelijks 0 (Bijna) Dagelijks

6 - 10	**Kruis het vakje aan om aan te geven hoe je de volgende aspecten van de route ervaart (één antwoord mogelijk)**					
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
6.1	Ik vind de route veilig	0	0	0	0	0
6.2	Ik vind kwaliteit van het wegdek voldoende	0	0	0	0	0
6.3	Ik vind de route stressvol	0	0	0	0	0
6.4	Ik vind de route druk	0	0	0	0	0
6.5	Ik vind de route comfortabel	0	0	0	0	0
6.6	Ik vind dat de route goed doorstroomt	0	0	0	0	0
6.7	Ik vind dat er veel mogelijke routes zijn (zijstraten e.d.)	0	0	0	0	0
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
7.1	Ik vind de bebouwing afwisselend	0	0	0	0	0
7.2	Ik vind de bebouwing sfeervol	0	0	0	0	0
7.3	Ik vind de bebouwing aantrekkelijk	0	0	0	0	0
7.4	Ik vind de bebouwing interessant	0	0	0	0	0
7.5	Ik vind de bebouwing uniek	0	0	0	0	0
7.6	Ik vind de bebouwing verzorgd	0	0	0	0	0

Vul ook de vragen op de achterzijde van deze pagina in.

		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
8.1	Ik vind de hoeveelheid groen (parken, bomen, tuinen, perkjes) voldoende	0	0	0	0	0
8.2	Ik vind het groen afwisselend	0	0	0	0	0
8.3	Ik vind het groen sfeervol	0	0	0	0	0
8.4	Ik vind het groen aantrekkelijk	0	0	0	0	0
8.5	Ik vind het groen interessant	0	0	0	0	0
8.6	Ik vind het groen rustgevend	0	0	0	0	0
8.7	Ik vind het groen verzorgd	0	0	0	0	0
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
9.1	Ik vind de verschillende functies in de omgeving afwisselend	0	0	0	0	0
9.2	Ik vind de verschillende functies in de omgeving sfeervol	0	0	0	0	0
9.3	Ik vind de verschillende functies in de omgeving levendig	0	0	0	0	0
9.4	Ik vind de verschillende functies in de omgeving aantrekkelijk	0	0	0	0	0
9.5	Ik vind de verschillende functies in de omgeving interessant	0	0	0	0	0
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
10.1	Ik vind het verloop van de route afwisselend	0	0	0	0	0
10.2	Ik vind het verloop van de route interessant	0	0	0	0	0
10.3	Ik vind het verloop van de route rustgevend	0	0	0	0	0
10.4	Ik vind het verloop van de route uitdagend	0	0	0	0	0
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
10.5	Ik vind het uitzicht verrassend	0	0	0	0	0
10.6	Ik vind het uitzicht nieuwsgierig makend	0	0	0	0	0

11	**Kruis het vakje aan (één antwoord mogelijk)**						
	Stel je zou deze route in het echt fietsen, wat voor gevoelens verwacht je dat deze route bij je oproept?						
11.1	Gespannen	0	0	0	0	0	Kalm
11.2	Verveeld	0	0	0	0	0	Opgewonden
11.3	Gefrustreerd	0	0	0	0	0	Tevreden
11.4	Moe	0	0	0	0	0	Alert

Vul ook de vragen op de volgende pagina in.

12	**Kruis het vakje aan (één antwoord mogelijk)**					
	Ik vind dit een aantrekkelijke route om te fietsen naar	Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
12.1	Studie/werk	0	0	0	0	0
12.2	Boodschappen	0	0	0	0	0
12.3	Winkelen	0	0	0	0	0
12.4	Uitgaan	0	0	0	0	0
12.5	Sport	0	0	0	0	0
12.6	Vrije tijd anders	0	0	0	0	0

13	**Kruis het vakje aan (één antwoord mogelijk)**					
		Zeer negatief	Negatief	Neutraal	Positief	Zeer Positief
	Wat is je totaal oordeel over de fietsroute?	0	0	0	0	0

14	**Kruis het vakje aan (één antwoord mogelijk)**					
		Zeer kort	Kort	Normaal	Lang	Zeer lang
14.1	Voor mijn gevoel duurde deze route	0	0	0	0	0
14.2	Hoe lang verwacht je dat het afleggen van de route duurde in minuten? Omcirkel de seconden.	……minuten	15	30	45	Seconden
14.3	Hoe lang schat je de route in meters	……meter				
15	Geef een cijfer voor deze route (1 t/m 10)	…….				

Sla de pagina nog niet om!
Je krijgt eerst een video te zien. Vervolg daarna de vragenlijst op de volgende pagina.

5	**Kruis het vakje aan (één antwoord mogelijk)**	
5.1	Ik ben bekend met deze route	0 Ja 0 Gedeeltelijk 0 Nee (ga door naar vraag 6)
5.2	Hoe vaak fiets je (een deel van) deze route?	0 Nooit 0 Maandelijks 0 Wekelijks 0 (Bijna) Dagelijks

6 - 10	**Kruis het vakje aan om aan te geven hoe je de volgende aspecten van de route ervaart (één antwoord mogelijk)**					
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
6.1	Ik vind de route veilig	0	0	0	0	0
6.2	Ik vind kwaliteit van het wegdek voldoende	0	0	0	0	0
6.3	Ik vind de route stressvol	0	0	0	0	0
6.4	Ik vind de route druk	0	0	0	0	0
6.5	Ik vind de route comfortabel	0	0	0	0	0
6.6	Ik vind dat de route goed doorstroomt	0	0	0	0	0
6.7	Ik vind dat er veel mogelijke routes zijn (zijstraten e.d.)	0	0	0	0	0
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
7.1	Ik vind de bebouwing afwisselend	0	0	0	0	0
7.2	Ik vind de bebouwing sfeervol	0	0	0	0	0
7.3	Ik vind de bebouwing aantrekkelijk	0	0	0	0	0
7.4	Ik vind de bebouwing interessant	0	0	0	0	0
7.5	Ik vind de bebouwing uniek	0	0	0	0	0
7.6	Ik vind de bebouwing verzorgd	0	0	0	0	0

Vul ook de vragen op de achterzijde van deze pagina in.

		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
8.1	Ik vind de hoeveelheid groen (parken, bomen, tuinen, perkjes) voldoende	0	0	0	0	0
8.2	Ik vind het groen afwisselend	0	0	0	0	0
8.3	Ik vind het groen sfeervol	0	0	0	0	0
8.4	Ik vind het groen aantrekkelijk	0	0	0	0	0
8.5	Ik vind het groen interessant	0	0	0	0	0
8.6	Ik vind het groen rustgevend	0	0	0	0	0
8.7	Ik vind het groen verzorgd	0	0	0	0	0
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
9.1	Ik vind de verschillende functies in de omgeving afwisselend	0	0	0	0	0
9.2	Ik vind de verschillende functies in de omgeving sfeervol	0	0	0	0	0
9.3	Ik vind de verschillende functies in de omgeving levendig	0	0	0	0	0
9.4	Ik vind de verschillende functies in de omgeving aantrekkelijk	0	0	0	0	0
9.5	Ik vind de verschillende functies in de omgeving interessant	0	0	0	0	0
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
10.1	Ik vind het verloop van de route afwisselend	0	0	0	0	0
10.2	Ik vind het verloop van de route interessant	0	0	0	0	0
10.3	Ik vind het verloop van de route rustgevend	0	0	0	0	0
10.4	Ik vind het verloop van de route uitdagend	0	0	0	0	0
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
10.5	Ik vind het uitzicht verrassend	0	0	0	0	0
10.6	Ik vind het uitzicht nieuwsgierig makend	0	0	0	0	0

11	**Kruis het vakje aan (één antwoord mogelijk)**						
	Stel je zou deze route in het echt fietsen, wat voor gevoelens verwacht je dat deze route bij je oproept?						
11.1	Gespannen	0	0	0	0	0	Kalm
11.2	Verveeld	0	0	0	0	0	Opgewonden
11.3	Gefrustreerd	0	0	0	0	0	Tevreden
11.4	Moe	0	0	0	0	0	Alert

Vul ook de vragen op de volgende pagina in.

12	**Kruis het vakje aan (één antwoord mogelijk)**					
	Ik vind dit een aantrekkelijke route om te fietsen naar	Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
12.1	Studie/werk	0	0	0	0	0
12.2	Boodschappen	0	0	0	0	0
12.3	Winkelen	0	0	0	0	0
12.4	Uitgaan	0	0	0	0	0
12.5	Sport	0	0	0	0	0
12.6	Vrije tijd anders	0	0	0	0	0

13	**Kruis het vakje aan (één antwoord mogelijk)**					
		Zeer negatief	Negatief	Neutraal	Positief	Zeer Positief
	Wat is je totaal oordeel over de fietsroute?	0	0	0	0	0

14	**Kruis het vakje aan (één antwoord mogelijk)**					
		Zeer kort	Kort	Normaal	Lang	Zeer lang
14.1	Voor mijn gevoel duurde deze route	0	0	0	0	0
14.2	Hoe lang verwacht je dat het afleggen van de route duurde in minuten? Omcirkel de seconden.	……minuten	15	30	45	Seconden
14.3	Hoe lang schat je de route in meters	……..meter				
15	Geef een cijfer voor deze route (1 t/m 10)	…….				

Sla de pagina nog niet om!
Je krijgt eerst een video te zien. Vervolg daarna de vragenlijst op de volgende pagina.

5	**Kruis het vakje aan (één antwoord mogelijk)**	
5.1	Ik ben bekend met deze route	0 Ja 0 Gedeeltelijk 0 Nee (ga door naar vraag 6)
5.2	Hoe vaak fiets je (een deel van) deze route?	0 Nooit 0 Maandelijks 0 Wekelijks 0 (Bijna) Dagelijks

6 - 10	**Kruis het vakje aan om aan te geven hoe je de volgende aspecten van de route ervaart (één antwoord mogelijk)**					
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
6.1	Ik vind de route veilig	0	0	0	0	0
6.2	Ik vind kwaliteit van het wegdek voldoende	0	0	0	0	0
6.3	Ik vind de route stressvol	0	0	0	0	0
6.4	Ik vind de route druk	0	0	0	0	0
6.5	Ik vind de route comfortabel	0	0	0	0	0
6.6	Ik vind dat de route goed doorstroomt	0	0	0	0	0
6.7	Ik vind dat er veel mogelijke routes zijn (zijstraten e.d.)	0	0	0	0	0
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
7.1	Ik vind de bebouwing afwisselend	0	0	0	0	0
7.2	Ik vind de bebouwing sfeervol	0	0	0	0	0
7.3	Ik vind de bebouwing aantrekkelijk	0	0	0	0	0
7.4	Ik vind de bebouwing interessant	0	0	0	0	0
7.5	Ik vind de bebouwing uniek	0	0	0	0	0
7.6	Ik vind de bebouwing verzorgd	0	0	0	0	0

Vul ook de vragen op de achterzijde van deze pagina in.

		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens	
8.1	Ik vind de hoeveelheid groen (parken, bomen, tuinen, perkjes) voldoende	0	0	0	0	0	
8.2	Ik vind het groen afwisselend	0	0	0	0	0	
8.3	Ik vind het groen sfeervol	0	0	0	0	0	
8.4	Ik vind het groen aantrekkelijk	0	0	0	0	0	
8.5	Ik vind het groen interessant	0	0	0	0	0	
8.6	Ik vind het groen rustgevend	0	0	0	0	0	
8.7	Ik vind het groen verzorgd	0	0	0	0	0	
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens	
9.1	Ik vind de verschillende functies in de omgeving afwisselend	0	0	0	0	0	
9.2	Ik vind de verschillende functies in de omgeving sfeervol	0	0	0	0	0	
9.3	Ik vind de verschillende functies in de omgeving levendig	0	0	0	0	0	
9.4	Ik vind de verschillende functies in de omgeving aantrekkelijk	0	0	0	0	0	
9.5	Ik vind de verschillende functies in de omgeving interessant	0	0	0	0	0	
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens	
10.1	Ik vind het verloop van de route afwisselend	0	0	0	0	0	
10.2	Ik vind het verloop van de route interessant	0	0	0	0	0	
10.3	Ik vind het verloop van de route rustgevend	0	0	0	0	0	
10.4	Ik vind het verloop van de route uitdagend	0	0	0	0	0	
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens	
10.5	Ik vind het uitzicht verrassend	0	0	0	0	0	
10.6	Ik vind het uitzicht nieuwsgierig makend	0	0	0	0	0	
11	**Kruis het vakje aan (één antwoord mogelijk)**						
	Stel je zou deze route in het echt fietsen, wat voor gevoelens verwacht je dat deze route bij je oproept?						
11.1	Gespannen	0	0	0	0	0	Kalm
11.2	Verveeld	0	0	0	0	0	Opgewonden
11.3	Gefrustreerd	0	0	0	0	0	Tevreden
11.4	Moe	0	0	0	0	0	Alert

Vul ook de vragen op de volgende pagina in.

12	**Kruis het vakje aan (één antwoord mogelijk)**					
	Ik vind dit een aantrekkelijke route om te fietsen naar	Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
12.1	Studie/werk	0	0	0	0	0
12.2	Boodschappen	0	0	0	0	0
12.3	Winkelen	0	0	0	0	0
12.4	Uitgaan	0	0	0	0	0
12.5	Sport	0	0	0	0	0
12.6	Vrije tijd anders	0	0	0	0	0

13	**Kruis het vakje aan (één antwoord mogelijk)**					
		Zeer negatief	Negatief	Neutraal	Positief	Zeer Positief
	Wat is je totaal oordeel over de fietsroute?	0	0	0	0	0

14	**Kruis het vakje aan (één antwoord mogelijk)**					
		Zeer kort	Kort	Normaal	Lang	Zeer lang
14.1	Voor mijn gevoel duurde deze route	0	0	0	0	0
14.2	Hoe lang verwacht je dat het afleggen van de route duurde in minuten? Omcirkel de seconden.	……minuten	15	30	45	Seconden
14.3	Hoe lang schat je de route in meters	……..meter				
15	Geef een cijfer voor deze route (1 t/m 10)	…….				

Sla de pagina nog niet om!
Je krijgt eerst een video te zien. Vervolg daarna de vragenlijst op de volgende pagina.

5	**Kruis het vakje aan (één antwoord mogelijk)**	
5.1	Ik ben bekend met deze route	0 Ja 0 Gedeeltelijk 0 Nee (ga door naar vraag 6)
5.2	Hoe vaak fiets je (een deel van) deze route?	0 Nooit 0 Maandelijks 0 Wekelijks 0 (Bijna) Dagelijks

6 - 10	**Kruis het vakje aan om aan te geven hoe je de volgende aspecten van de route ervaart (één antwoord mogelijk)**					
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
6.1	Ik vind de route veilig	0	0	0	0	0
6.2	Ik vind kwaliteit van het wegdek voldoende	0	0	0	0	0
6.3	Ik vind de route stressvol	0	0	0	0	0
6.4	Ik vind de route druk	0	0	0	0	0
6.5	Ik vind de route comfortabel	0	0	0	0	0
6.6	Ik vind dat de route goed doorstroomt	0	0	0	0	0
6.7	Ik vind dat er veel mogelijke routes zijn (zijstraten e.d.)	0	0	0	0	0
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
7.1	Ik vind de bebouwing afwisselend	0	0	0	0	0
7.2	Ik vind de bebouwing sfeervol	0	0	0	0	0
7.3	Ik vind de bebouwing aantrekkelijk	0	0	0	0	0
7.4	Ik vind de bebouwing interessant	0	0	0	0	0
7.5	Ik vind de bebouwing uniek	0	0	0	0	0
7.6	Ik vind de bebouwing verzorgd	0	0	0	0	0

Vul ook de vragen op de achterzijde van deze pagina in.

		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens	
8.1	Ik vind de hoeveelheid groen (parken, bomen, tuinen, perkjes) voldoende	0	0	0	0	0	
8.2	Ik vind het groen afwisselend	0	0	0	0	0	
8.3	Ik vind het groen sfeervol	0	0	0	0	0	
8.4	Ik vind het groen aantrekkelijk	0	0	0	0	0	
8.5	Ik vind het groen interessant	0	0	0	0	0	
8.6	Ik vind het groen rustgevend	0	0	0	0	0	
8.7	Ik vind het groen verzorgd	0	0	0	0	0	
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens	
9.1	Ik vind de verschillende functies in de omgeving afwisselend	0	0	0	0	0	
9.2	Ik vind de verschillende functies in de omgeving sfeervol	0	0	0	0	0	
9.3	Ik vind de verschillende functies in de omgeving levendig	0	0	0	0	0	
9.4	Ik vind de verschillende functies in de omgeving aantrekkelijk	0	0	0	0	0	
9.5	Ik vind de verschillende functies in de omgeving interessant	0	0	0	0	0	
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens	
10.1	Ik vind het verloop van de route afwisselend	0	0	0	0	0	
10.2	Ik vind het verloop van de route interessant	0	0	0	0	0	
10.3	Ik vind het verloop van de route rustgevend	0	0	0	0	0	
10.4	Ik vind het verloop van de route uitdagend	0	0	0	0	0	
		Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens	
10.5	Ik vind het uitzicht verrassend	0	0	0	0	0	
10.6	Ik vind het uitzicht nieuwsgierig makend	0	0	0	0	0	
11	**Kruis het vakje aan (één antwoord mogelijk)**						
	Stel je zou deze route in het echt fietsen, wat voor gevoelens verwacht je dat deze route bij je oproept?						
11.1	Gespannen	0	0	0	0	0	Kalm
11.2	Verveeld	0	0	0	0	0	Opgewonden
11.3	Gefrustreerd	0	0	0	0	0	Tevreden
11.4	Moe	0	0	0	0	0	Alert

Vul ook de vragen op de volgende pagina in.

12	**Kruis het vakje aan (één antwoord mogelijk)**					
	Ik vind dit een aantrekkelijke route om te fietsen naar	Zeer oneens	Oneens	Niet oneens/ niet eens	Eens	Zeer eens
12.1	Studie/werk	0	0	0	0	0
12.2	Boodschappen	0	0	0	0	0
12.3	Winkelen	0	0	0	0	0
12.4	Uitgaan	0	0	0	0	0
12.5	Sport	0	0	0	0	0
12.6	Vrije tijd anders	0	0	0	0	0

13	**Kruis het vakje aan (één antwoord mogelijk)**					
		Zeer negatief	Negatief	Neutraal	Positief	Zeer Positief
	Wat is je totaal oordeel over de fietsroute?	0	0	0	0	0

14	**Kruis het vakje aan (één antwoord mogelijk)**					
		Zeer kort	Kort	Normaal	Lang	Zeer lang
14.1	Voor mijn gevoel duurde deze route	0	0	0	0	0
14.2	Hoe lang verwacht je dat het afleggen van de route duurde in minuten? Omcirkel de seconden.	……minuten	15	30	45	Seconden
14.3	Hoe lang schat je de route in meters	……..meter				
15	Geef een cijfer voor deze route (1 t/m 10)	…….				

Je bent klaar met het bekijken van de video's. Ga naar de volgende pagina voor het laatste deel van de vragenlijst.

16	**Vul de nummers van de route in**				
		meest			minst
16.1	Zet de routes in volgorde van ervaren afstand				
16.2	Zet de routes in volgorde van ervaren tijdsduur				
16.3	Zet de routes in volgorde van aantrekkelijkheid				

17	**Kruis het vakje aan of vul het juiste antwoord in**		
17.1	Wat is je geslacht?	0 Man	0 Vrouw
17.2	Hoe oud ben je?	..... jaar	
17.3	Wat voor opleiding doe je momenteel	0 MBO niveau 1	0 WO Bachelor
		0 MBO niveau 2	0 Pre Master
		0 MBO niveau 3	0 WO Master
		0 MBO niveau 4	0 Anders, namelijk…
		0 HBO Bachelor	
17.4	Hoe lang studeer je in Utrecht?	.....jaar	……..maanden
17.5	Wat is je woonplaats? (als je in Utrecht woont geef aan in welke wijk)	……	
17.6	Wat is je woonsituatie?	0 Uitwonend	0 Thuiswonend
17.7	Met welke cultuur voel je je verbonden? *(er zijn meerdere antwoorden mogelijk)*	0 Nederlandse	0 Surinaamse
		0 Marokkaanse	0 Antilliaanse
		0 Turkse	0 Anders, namelijk…

Je bent klaar met de vragenlijst. Bedankt voor je medewerking!

Het je vragen of opmerkingen? Laat het ons weten!
Wil je graag de resultaten ontvangen, vul dan je e-mailadres in.

E-mailadres:
Opmerking: