

# **Neighbourhood Liveability and Active modes of transport**

## **The city of Amsterdam**

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### Acknowledgment

The curiosity to understand what makes out cities better, and how we can understand the city from the eyes of the citizens is what led me to choose this topic of research. Looking back, I could have chose many different routes for this research, and the choice that was made is one drop in the ocean.

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I am eager and excites to start my professional path, to have the opportunity to bring the theory into practice, in an even more complex reality.

Enjoy the reading,

Yael Federman

**Abstract**

The present study investigates the relationship between liveability and the use of cycling and walking for transport. In the context of this study, liveability is measured by analyzing three dimensions: civic engagement in local issues, social relations between neighbours, and the composition of the physical environment such as the presence of communal spaces and the proximity of residential areas to places that cater to daily needs. A case study was conducted in the city of Amsterdam using a convenience sample of 71 voluntary participants (44 women and 27 men).

The participants filled out an online questionnaire that was evaluated statistically. First, a correlation between the variables was evaluated, and this was followed by a regression analysis that determined the direction of the correlation.

The results suggest that there is a partial relationship between cycling and the liveability of urban spaces. A positive correlation was found between cycling and satisfaction; participants who cycled more often reported higher levels of satisfaction with their neighbourhoods. There was also a positive correlation between cycling and civic engagement; participants who cycled more often reported higher levels of civic engagement regarding issues affecting their neighbourhoods. A correlation between walking and social relations between neighbours was not found.

## 1. Introduction

For much of the second half of the 20<sup>th</sup> century, urban streets were perceived as routes, which were used primarily by vehicles, connecting different areas of a city. Even though the function of urban streets remains the same, the importance of the street as a public space for social and communal encounters has become increasingly important over the past three decades (Jacobs, 1993). The design and structure of a city's streets (among other factors) influences the nature of social occurrences and the evolution of communities. However, this relationship is reciprocal, and communities also influence the design of their streets and neighbourhoods.

More and more people, including planning professionals and academics, are seeking to improve the liveability of neighbourhoods. Among the most relevant questions concerning this topic are: How can planners create more liveable neighbourhoods? And what makes our neighbourhoods more liveable? These questions are the starting point and inspiration for this research project.

### 1.1. Liveability, cycling and walking

Liveability is a central concept for urban planning, and it appears in both academic literature and non-academic documents, such as those outlining municipal policies and city plans. Although the term "liveability" is widely used, it lacks a unified definition, and it can be argued that it is a highly relative term. Nevertheless, the concept remains prevalent, and the ambiguity of the term allows diverse stakeholders to take interest in liveability as a goal of public policy (National Research Council, 2002).

The concept of liveability may include topics related to social, physical and safety concerns (Gemeente Amsterdam Directie Openbare Orde en Veiligheid Bureau Onderzoek en Statistiek, 2013), as well as issues of economics, education and public health (Pampanga et al., 2015). Liveability is often used as a ranking tool that draws on diverse indicators to evaluate neighbourhoods and cities. These indicators include, but are not limited to, public safety, social relations, maintenance of the streets, open spaces and proximity to job opportunities (Leby & Hashim, 2010). Local facilities and networks of transportation are also important factors for ranking liveability. They can function as stimulators for community life and the restoration of a "positive sense of community" (Transit Cooperative Research Program, 1997).

This study focuses on the social aspects of liveability, which include topics like personal relations between neighbours, social engagement, and the existence of physical elements (such as public spaces) in a neighbourhood that foster social encounters. Liveability in this case study is used in order to understand community related aspects together with the general satisfaction of citizens from their neighbourhood. By assessing people's perceptions of the physical common space, the level at which citizens feel socially connected to

community life and to what level do people feel they are actively involved in their community.

Research shows that expanding the number of transportation options in a community is related to increased levels of liveability (Young & Hermanson, 2012), regardless of the actual frequency of cycling and walking. Indeed, better mobility and accessibility are related to higher levels of liveability. And the presence of alternative mobility options that allowed individuals to choose a mode of transport that met their particular needs was found to be a positive stimulus for increasing the level of liveability of a community (Transit Cooperative Research Program, 1997). Meanwhile, slow traffic (walking and cycling) was found to influence citizens' perceptions of their neighbourhoods, and to encourage informal meetings between people in public spaces (D Appleyard, 1981). These slower forms of transport promote and strengthen interpersonal relations between neighbours and create a feeling of community and, thus, greater liveability.

Many factors influence whether or not people choose to cycle or walk, such as the presence of appropriate infrastructure for cyclists and pedestrians. Social factors also affect this decision. Studies show that social support influences the modes of transportation that people decide to use (Eriksson & Forward, 2011). Furthermore, perceptions and the social environment affect attitudes toward cycling and travel behaviour (Willis et al., 2015). Thus, prevailing attitudes in the immediate social surroundings and the behaviour of friends, co-workers and family all have a great influence on transport choices, particularly on the choice to cycle.

This study will focus on how individuals perceive community related aspects of liveability, and their relationship to personal choices in transportation, particularly on the choice to cycle and walk. The goal of the study is twofold. First, it seeks to determine whether there is a correlation between the choice of cycling and walking as means of transportation and increased levels of liveability. Second, it attempts to demonstrate whether people who live in more liveable communities tend to engage in cycling and walking as means of transport more frequently, or, if people who tend to cycle and walk more as a mean of transport will be more engaged and satisfied from their neighbourhood.

## **1.2. Research aim and research question**

In urban planning circles, interest in car-free, walkable cities is rising. This trend can be traced to two primary sources. On the one hand, environmental concerns, particularly the desire to decrease carbon emissions, have influenced urban planning professionals to eschew motorized forms of transportation. On the other hand, shifting away from motorized travel has had a positive effect on quality of people's life.

One can assume that as more cyclists and pedestrians begin to enter urban streets, the ratio of humans to cars begins to change. More human activity in the streets can lead to more

informal meetings between people, and thus higher levels of liveability. From this conclusion, one could extrapolate that liveable communities might lead to an increase in public safety and thus a greater desire to be in the street and to use more active modes of transportation. This research aims to examine these claims, and to see whether there is a correlation between personal choices in transportation and liveability.

This study will utilize existing theories of liveability, focusing on the particular aspects that the concept encompasses, and the relation between liveability and personal choices of active modes of transportation (e.g. cycling, walking). Against this background, the central research question is as follows:

Does liveability correlate with personal choices regarding active modes of transportation, and vice versa?

### **1.3. Scientific and social relevance**

Both liveability and the use of active modes of transportation are related to higher levels of health (Lowe et al., 2013). These factors are not merely associated with the absence of disease, but with complete physical, mental, and social wellbeing (WHO, 2008). The use of active modes of transportation implies a healthier way of living, and thus a healthier population (Lowe et al., 2013). Additionally, an inverse relationship was found between the use of active modes of transportation and cancer mortality, morbidity, and middle-aged morbidity (Oja et al., 2011). There are also lower levels of negative migration from liveable communities (National Research Council, 2002) and higher levels of satisfaction.

Community restoration projects may promote the use of active modes of transportation and vice versa. Demonstrating such a correlation could help researchers understand how to create healthy sustainable communities, and could contribute to the development of more effective public policies that address the use of active modes of transportation and community development.

Although the relationship between the variety of choices for transportation and liveability has been discussed extensively in the literature (Young & Hermanson, 2012), the relationship between liveability and personal choices in transportation has not yet been investigated. The current study will address this lacuna by defining the concept of liveability as a measure of community strength and a sense of belonging, and, from there, examining the correlation between liveability and the choice of participants to cycle and walk as means of transportation.

## **2. Theoretical background**

The term “liveability” has become popular over the last decade (Lowe et al., 2013). It is defined in different ways by different scholars, and it is used as a planning tool or as a tool for measuring and comparing neighbourhoods and cities around the world. It addresses a wide range of factors using ranking methods, which give scores to different elements of a neighbourhood (transport options, land use, health, education, safety, etc.). Due to the ambiguity of the term, it is also possible to measure liveability as the sum of factors that exist in or are absent from a neighbourhood. In other words, to use it as a means to evaluate a neighbourhood from the perspective of the needs and wants of the people who live or intend to live in a particular place. Already, in the 1960s, Jacobs (1961) wrote about designing space for creating “liveable streets” that promote a sense of community. In the following decades, Johnson (1974) emphasized the proximity effect on social contact, and D. Appleyard (1981) referred to streets as places for people that should therefore be designed as liveable places for citizens. He found an association between liveable neighbourhoods with slow traffic patterns. B.S. Appleyard (2005) addresses community liveability, specifically the effect of designing safe streets and routes to school for children. These approaches all emphasize the perception that streets should be planned for people and the importance of planning in creating a liveable community. Following the work of the aforementioned studies, this research project tries to focus on the aspect of active transport and its correlation to community liveability. This chapter attempts to create a better picture of community liveability by reviewing the various ways in which the term is used in academic and planning literature, and then emphasizing the particular dimensions of community liveability that are relevant to this research project. It will then focus on the different motives that encourage people to cycle and walk.

### **2.1. The concept of liveability**

Different communities and people emphasize different underlying variables when defining liveability. These differences can be attributed to the different perceptions, values, and desires of the individuals that are judging the liveability of a place. Moreover, in some contexts, liveability has become so closely intertwined with sustainability that it suffers from conceptual overlapping as well as a lack of a clear definition (Young & Hermason, 2012). However, there is some consensus regarding the key elements of liveable communities (Lowe et al., 2013). Generally speaking, these include physical, social, economic and educational elements.

Liveability addresses the relation between people in a particular place (community) and the physical environment where this relation takes place. One definition of liveable communities suggests that, “a liveable community is one that has appropriate housing, supportive community, features services and adequate mobility options, which together facilitate personal independence and the engagement of residents in civic and social life” (Kochera et al., n.d, p.6). As one can see, this definition of liveability relies on physical elements measures, that influence community engagement and levels of independent of a



community. Thus, the engagement of residents in civic and social life may be on its own a good indicator of liveability in a neighbourhood, and might help us understand to what extent people care about their surroundings.

Allison et al. (2005) found that liveable communities develop strong identities, and members invest time and effort in the planning processes that maintain and help develop their communities. Thus, a more liveable community would tend to be more engaged in local development and help create “better” places for people to live in. Even if the basic needs of a community or an individual are provided for (i.e. infrastructure, health care, education, water, food, housing etc.), there is still a need to understand what are the desires of the community and what can be improved by planners and other decision makers to promote progress and improve liveability (de Hollander & Staatsen, 2003). The social components of the liveability index are of great importance because they represent how people experience their space. In other words, they reflect the ways in which the residents of a community perceive their community’s liveability. In a country such as the Netherlands, the ways in which individuals judge their surroundings is of great importance. These judgements include the social and environmental perspectives of residents on their neighbourhoods. (Ruth & Franklin, 2014).

Each city uses different sets of indicators to evaluate liveability. A city chooses the indicators that reflect the needs and desires of its neighbourhoods and communities. For example, in the city of Johor, Malaysia, Pampanga et al. (2015) divided liveability into 11 domains: (1) urban infrastructure and services; (2) climate resiliency and disaster preparedness; (3) protection of urban environmental resources; (4) public health and wellness services; (5) access to quality education; (6) dynamism and promotion of the local economy; (7) ease in urban transportation and mobility; (8) good governance; (9) social equality and security; (10) social cohesion and connectedness; and (11) urban recreation and accommodation facilities. Each one of the domains consists of different variables, and the sum of those variables provide the rank for the domain (Pampanga et al., 2015). In Melbourne, Australia, the municipality distinguishes between 11 different policy areas (Lowe et al., 2013): crime and safety, housing, education employment and income, health and social services, transport, public open space, social cohesion and local democracy, leisure and culture, food and other local goods and natural environment. These indicators prioritize the “human aspect” of liveability and are used as a tool for better planning. In the city of Amsterdam, a 2015 survey used the following dimensions to measure liveability: housing, population composition, safety and nuisance, physical environment and proximity to services (RIGO Research and Advise, 2014). In addition to the aforementioned dimensions, an additional survey chose to add “public engagement” (Gemeente Amsterdam, 2016).

Liveability seems to be primarily related to the physical aspects of a particular place and the relationship between the environment and social life (Lowe et al., 2013). Moreover, it is usually conceived of as a quality of a place, which can be measured by observing physical

aspects of the environment. In developed countries (such as the Netherlands) where infrastructure and the physical environment are well established, analyzing people's perceptions of the quality of the physical environment, their social relations in the neighbourhood in which they live and their engagement in local processes is especially important in order to evaluate the liveability of a place (Okulicz- Kozaryn, 2011). Those aspects will be discussed in the following section.

## **2.2. Components of liveability**

Liveability can be evaluated through either social or physical dimensions. Researchers intend to observe the liveability of a neighbourhood through the eyes of the people who live in it. The main focus of the social domain is the people that live in the communities that are being studied. The subjects are evaluated by observing citizen involvement in the community, their social relations and the physical structures that support social occurrence.

### **2.2.1. Social dimension**

D. Appleyard (1981) found that the chances of spontaneously meeting neighbours in public spaces increase with greater use of slower modes of transport (cycling and walking) and reduced use of cars. In other words, when people cycle and walk in their neighbourhood they are more likely to meet and get to know their neighbours. Unplanned meetings, as such, might create trust and foster personal relations between neighbours, thus creating a more liveable and safe environment for citizens in the neighbourhood.

Personal relationships between neighbours are factors that affect the liveability of a place. The moral support that participants in these relationships provide for each other is a crucial factor that influences an individual's self-reported satisfaction with their surroundings. However, the quality of the relationship has an important influence, in and of itself, on liveability (Leby & Hashim, 2010). In conclusion, the existence of relationships between neighbours, and the quality of those relations, influence individuals' perceptions of their neighbourhoods.

In *Bowling Alone*, Putman D. (1995) discusses the importance of social capital. Social capital refers to the "non-material capital of a community"- social relations between members of a community and the shared norms and values that allow cooperation between community members (OECD, n.d.). In some cases, social capital is addressed as shorthand for social networks and norms of mutuality and trust (Sander & Putnam, 2010). Citizens with social capital were found to be happier and healthier, and there were lower rates of crime and improved economic productivity in their communities (Putman, 1995).

As such, one can say that social relations do not only influence the quality of a community but also its potential prosperity. Thus, it influences the liveability of a place.

The social dimension, by its nature, overlaps with levels of social engagement. Social trust, which has to do with the quality of relationships between people, is correlated with social

engagement across time and across countries. In places where there is more density of associational membership, citizens will be more trusting. Therefore, social capital includes the two facets of trust and engagement (Putnam, 1995). Engagement will be discussed thoroughly in the following section.

### 2.2.2. Social engagement in local issues

Researchers demonstrated a correlation between civically engaged communities and lower rates of urban poverty, better public health outcomes, and a more educated population (Putnam, 2001). In other words, civic engagement contributes to better and healthier lives. When members of a community are actively involved in day to day community life and local decision making, they influence the constitution of their neighbourhood and community.

Civic engagement in decision-making processes is an important aspect for the existence of democracy. There are two primary ways that citizens participate in these processes. In the first, data is collected and afterwards decision makers use it as a reference to make plans. The second is a bottom up process where the community is initiating the decision making process for themselves (Michels & De Graaf, 2010). Civic engagement, therefore, is more than simply an effort to create a bridge between citizens and their government. It also consists of citizen participation in local decision making and activities such as community events, mutual help, and local initiatives. This gives a better picture of the strength of the community across the participatory decision making process. When a community is involved in its own development, the common spaces of the community shift from areas that belongs to no one to places that belong to everyone (Hardin, 2003). Moreover, social engagement ensures that the community takes responsibility for itself, thus preventing neglect of physical and mental aspects of community life and generally promoting a healthier community.

### 2.2.3. Physical dimension

This section discusses the way the physical environment can affect one's mood and well-being, in direct or indirect ways, and thus influence liveability. The physical environment of a community, including the different material elements and their location in space, greatly influences the way people feel about their surroundings (Sauter & Huettenmoser, 2008). Generally speaking, streets that allow informal meetings between people result in a more liveable environment.

The density of an area can influence the amount and quality of socializing that takes place in it. Low-density areas are generally characterized by disperse social networks with few strong relationships; whereas high-density areas are typically characterized by smaller social networks with stronger ties (Raman, 2010). Moreover, physical proximity can positively influence perceptions of friendliness and community spirit (Raman, 2010). Proximity to daily needs such as education, health, food, leisure activities and transportation options has a positive influence on the liveability of a community and its members' perceptions of the

common space (Porter, 2002). The street together with designated open and public spaces provide places in the community for social meetings. These spaces play an important role in the creation of social life and liveable neighbourhoods (Cattell et al., 2008). Playgrounds for children, parks and community centres allow social occurrences to happen. This implies that the physical environment influences the social dimensions in a direct way. Urban vegetation is also related to the level of comfort that people experience in their environments. Mature trees were found to influence comfort levels due to the shade that they provide on the street level (Potcher, 2014) and the way they that they separate the sidewalk and the street, which creates a sense of safety for cyclists and pedestrians (Herrington, 1974).

The sense of place experienced by neighbourhood residents is related to personal satisfaction with life in a specific place (Leby & Hashim, 2010). The physical elements of space and social occurrences influence each other. Space provokes social “events,” and a sense of space can also be formed as a result of social occurrences (Löw, 2008). The perception of space is influenced by physical elements together with social relationships in the neighbourhood. Furthermore, the way in which an individual goes through space has an influence on social occurrences (Appleyard, 1981). When a person is driving or riding in a car, they do not directly experience being in the street. Their experience is mediated by being in a car, and, thus, they experience the space of the street in a different way than a cyclist, for example. Cyclists and pedestrians have a less mediated experience of the street, and therefore they have more opportunities for informal social interactions than people travelling in cars.

### **2.3. Active transport: influences and relation with liveability**

Cycling and walking as means of transport offer advantages that affect both the personal and communal levels of a society. The main advantages discussed in the literature address personal benefits, such as improved physical and psychological health, and social benefits that improve the wellbeing of the community and the environment. Cycling and walking can be perceived as physical activities that are practiced for the sake of exercise as well as means to reach a destination. In this sense they should be understood as providing a solution for two basic needs that members of a community experience: the need for transportation and the need for sport and leisure. Cycling as a mean of transport brings physical activity into daily life and as such promotes higher levels of physical and mental health. Furthermore, it has been found to be associated with higher levels of happiness. The commuter benefits indirectly from the use of active modes by doing physical activity “on the way” (Lathia et al., 2017). Since cycling and walking have been found to be beneficial on a personal and social levels (Wardman, 2007), much effort is being invested into understanding what encourages people to choose active modes of transportation.

Active modes of transportation or travel usually refer to travelling by bicycle or walking (Maibach, 2009). In this research, non-motorized transportation, active modes and cycling

and walking, will all refer to one's personal use of bicycle or walking as a mean of transport. Generally speaking, active modes of transport are environmentally friendly and promote health for participants and their communities (Wardman, 2007). Engaging in physical activity such as cycling and walking on a regular basis is significant in reducing a number of health-related problems, such as obesity, diabetes, certain forms of cancer, and depression (Pate et al., 1995). The use of active modes of transport instead of cars greatly contributes to reducing local air pollution, pedestrian injuries, and sedentary behavior. In the U.S.A, nearly a third of all greenhouse gas emissions are related to transport (Maibach, 2009). A study in the city of Barcelona in 2011, found that the benefits of cycling in terms of health and carbon dioxide emissions are greater than the risks that might be involved in cycling (Rojas-Rueda, 2011). It was found that neighbourhoods with slow traffic are safer, promote more informal meetings on the street and positively affect the perception of citizens over the neighbourhood (D. Apelyard, 1981). One way to create streets with slow traffic is by promoting the use of cycling instead of cars and other motorized vehicles. In the Netherlands, even though one quarter of all commutes are done by bicycle, cars are being used for 30% of commutes up to 5 km (Centraal Bureau voor de Statistiek, 2007).

Many factors influence the personal choice to cycle as a mean of transport. Some influences are related to the environment and its planning structure, such as infrastructure for cyclists, distance between daily activities and transportation options, while others are related to personal and cultural characteristics, such as age, gender and socio-economic aspects. These factors are examined in-depth in the following section, which will review the socio-economic, physical, environmental, cultural and social elements that influence transportation choices.

### 2.3.1. Socio-economic factors

This section presents different social factors that were found to influence levels of cycling and walking. Aside from age, gender and social composition, the influence of income as a predictor for cycling and walking habits as means of transportation is also discussed in the literature. Although there is an apparent difference in the transportation choices of low-income and high-income individuals (Shafizadeh & Niemeier, 1997), in so far as individuals earning lower incomes tend to cycle and walk more for transportation, the difference in countries such as Germany, Denmark and the Netherlands is minor (Pucher & Buehler, 2008).

#### **Age**

Different age groups tend to choose different modes of transportation. Furthermore, change is occurring over time. Elderly people (60+) are currently wealthier than their counterparts were 50 years ago, and they are more likely to have a driver's license and to own a car. The younger population (who can legally drive) is less likely to have a car, one out of five people under the age of 25 own a car. This may in part be explained by the internal migration of young populations to big metropolitan areas where owning a

car is less attractive than forms of alternative transportation (\*Centraal Bureau voor de Statistiek, 2015).

Young people cycle more than older people in the Netherlands; almost a third of all bicycle trips (32%) are done by people 18 years old or younger. For the proportion of the population over the age of 50, the frequency of cycling trips declines as well as the cycle share (Harms et al, 2014). Furthermore, the average cycling distance per day reduces with age. Individuals between the ages of 12-15 years old will cycle 6.5 kilometers on average, in comparison to individuals over the age of 65 years old who travel an average of around 2 kilometres per day (Centraal Bureau voor de statistiek, 2015). However, the distance cycled for leisure is increasing with age (Harms et. Al, 2014).

### **Gender**

Overall, women were found to cycle less than men for transport and for recreation (Heesch et al., 2012); however, the differences are most significant among populations who tend to cycle less. In countries where cycling rates are lower, men tend to cycle more, whereas in countries with high cycling rates, such as the Netherlands, one cannot find such a difference (Garrard et.al. 2008). Therefore, one can say that in the city of Amsterdam differences in cycling rates between genders are minor. Moreover, men and women are affected by different motives and constraints when making the decision to cycle. Women were found to be affected by more constraints, such as weather, distance, etc., than men (Heesch et al., 2012). Generally speaking, gender differences related to cycling in the Netherlands are not significant, and, on the contrary it has been shown that in the Netherlands woman cycle more often than men (Harms et. Al, 2014).

### **Social group**

The mode share of active transportation is also influenced by differences in population composition. For instance, lower rates of cycling are found among immigrants in the Netherlands (Harms et. al, 2014). It was found that non-western migrants tend to cycle less than people born in the Netherlands. Those findings are relevant for all trip purposes, all age groups and regardless of socio-economic differences (income, education etc.) (Harms et. al, 2014). The importance of cycling culture on the choice to cycle is made evident from these findings and the relationship is discussed in section 2.3.3 of this study.

#### **2.3.2. Physical characteristics of the built environment**

In planning studies one can find support for the fact that the physical environment affects the use of walking and cycling as modes of transportation and the frequency of physical activity (Saelens, 2003). According to Ewing and Cervero (2010) the physical environment is comprised of five D's: design, which includes sufficient sidewalks and cycling paths or lanes; diversity, which refers to the mixed use of land; density, which is comprised of residents

and/or employees; destination accessibility, which refers to the ease of access to employment possibilities; and distance to transit, which refers to accessibility to means of transportation, among others.

### **Street design**

Creating convenient walking and cycling paths or routes is one of the important factors in encouraging people to use active transport. With sufficient infrastructure for at least half of the journey, good parking places for bicycles and other related services such as showers in the workplace, cycling can become an important mode of transport with definite impact on modal split (Maibach, 2009).

### **Urban densities and mixed land use**

Connectivity and proximity are also highly influential on the mode of travel. When the destination of one's travel is within cycling or walking distance it is highly expected that those modes will be used. Proximity is determined by two other variables, density and mixed land (Saelens et al., 2003). More dense neighbourhoods with a mixed land use create an environment that encourages the use of cycling and walking because daily needs are more likely to be reached in a short distance.

### **Accessibility to other means of transport**

When less options of transportation are available, cycling is used less frequently as a means of transportation and there is a higher likelihood that commuters will choose to drive (Akar & Clifton 2009). Thus, investing in diverse public transportation and the construction of pedestrian friendly increases the amount of cyclists. In a similar way, when people need cars in order to reach the things that they enjoy, they are less likely to cycle (Emond and Handy 2012). A single transportation option is not enough to answer the mobility and accessibility needs of a community. In order to encourage people to cycle more, other transportation options should be provided to create a fully supported system. Nonetheless, the current study does not deal with other means of transportation (public transportation), and will focus on cycling and walking.

### **Destination accessibility**

Neighbourhoods with access to daily needs (work, food, health, leisure, etc.) within walking or cycling distance help maximize the benefits of all active modes of transport (Maibach, 2009). Krizek & Johnson (2006) found that people living less than 400 meters from a market tend to cycle or walk significantly more than those who live farther away.

As already mentioned, neighbourhoods with mixed land use allow people to reach their daily needs within shorter distances, thus encouraging the use of active modes of transport instead of cars (Saelens et al., 2003). Furthermore, in situations where travelling by bicycle is the quickest transportation option, its efficiency encourages the desire to cycle among commuters (Engbers & Hendriksen, 2010).

### 2.3.3. Cultural and social aspects

It is necessary to mention that public support is crucial for the successful implementation of transportation policies (Krizek & Johnson, 2006). From this, one can understand that public support for cycling as a mean of transport has an influence on how acceptable cycling is. Furthermore, enjoying cycling for recreation has a positive effect on choosing cycling as a means of transportation. Researchers have observed that there is a correlation between dissatisfaction related to driving and limited access to driving options and the use of active modes of transportation. However, as satisfaction with driving increases, the possibility of using bicycles as a mean of transport decreases (Dill & Voros, 2007).

Social opinion greatly influences the mode of transportation that people choose. The perception that cycling is “cool,” or a normal means of transportation, (Trapp et al. 2011 in Willis et.al, 2015) is positively related to the use of active modes of transport. The transportation preferences of others in one's surroundings and concerns over appearance seem to influence the decision to cycle (Willis et.al, 2015). Moreover, Eriksson and Forward (2011) found that social support is enough to encourage cycling, which is to say that subjective norms are more influential than the actual use of bicycles in an individual's surroundings (descriptive norms). For example, schoolchildren who were encouraged to cycle by their friends were more likely to cycle to school (Panter & Jones, 2010). One can conclude, then, that a supportive community, which is pro-cycling, will tend to cycle more than a community that is “anti-cycling” or indifferent to cycling. Cycling culture in the Netherlands has a significant influence over the choice to cycle. Although it started as a social claim and movement, planning processes and decisions have allowed cycling to become what it is today.

However, the number of cars in the Netherlands has increased by 25% in the past decade, from 6.3 million in 2000 to over 8 million in 2015. Furthermore, the number of motorcycles and mopeds has also increased (Centraal Bureau voor de Statistiek, 2015\*). Yet, the Netherlands still remains known for cycling, but this reputation should not be taken for granted. Efforts to understand the different motives and planning elements for encouraging bicycles as a means of transport are being undertaken in order to better understand and form suitable policies that encourage more people to cycle.

### 2.3.4. Other related aspects

Further influences on the choice to use active modes of transport are mentioned in the literature. Along with infrastructure, financial incentives are an important means of direct encouragement for the use of active modes (Maibach, 2009). Pricing policies such as the London Congestion Charging Scheme result in a decrease in car use and an increase in bicycle use. Reduced car parking, lower speed limits and policies that give priority to cyclists and pedestrians at intersections have a positive impact on the use of active modes. All of



these make it less attractive to use cars, and therefore make the use of other means more efficient in relative terms (Woodcock et al., 2007 in Maibach, 2009).

Last, but not least, there are some factors beyond human control, such as weather and topography, which influence the use of active modes. Mild summers, low humidity, and a level topography are some of the characteristics that increase expected use of active modes of transportation inside cities (Zahran, 2008). Saneinejad et al. (2012) found that wind and cold weather are related to less cycling and walking (especially among women), and surprisingly, a positive correlation was found between rain and walking.

## **2.4. Research questions**

The central research question as presented in chapter 1.2 addresses the relation between liveability and personal choices in transport (specifically cycling and walking). Building on previous literature on liveability, this project focuses on specific aspects of liveability that demonstrate the ways in which individuals perceive public space and community life by using three dimensions: social life, which includes the quality and amount of social relationships; the physical environment (RIGO Research and advise, 2014), especially the way in which individuals perceive public and common spaces; and engagement with local issues (Gemeente Amsterdam, 2016) i.e., how active citizens are in their community. The first and the third dimensions are indicators for the strength of community life and the second dimension reflects the way individuals perceive the public space and physical environment of their neighbourhood. These dimensions are the main focus of the study because they present liveability as a quality perceived by the inhabitants of the place that is being judged.

Since this study focuses on the city of Amsterdam, the selection of dimensions is influenced by those that were used in previous surveys of the city (RIGO Research and advise, 2014. ; Gemeente Amsterdam, 2016). However, the community aspects are emphasized and expanded.

We can see that understanding cycling behaviour is complex and influenced by many different factors. It is important to take this complexity into consideration when trying to isolate one aspect, in this case, communal aspects and their relation to cycling choices.

From the literature, three secondary questions can be formulated to specify the main research question:

1. Is there a correlation between cycling or walking for transportation on the one hand and engagement in local issues on the other?
2. Is there a correlation between cycling or walking for transportation on the one hand and social relations in the neighbourhood on the other?

3. Is there a correlation between cycling or walking for transport and a sense of satisfaction from the physical dimensions of the neighbourhood (open spaces, proximity to daily need etc.)?

### **Hypothesis**

It is expected that a positive correlation exists in each case between the different dimensions of liveability and cycling or walking as a means of transport. Furthermore, it is expected that a positive correlation exists between liveability and cycling or walking as a means of transport.

### **3. Methodology**

In this chapter, the methodological framework of the study will be presented. The research philosophy and strategy will be discussed together with the choice of methodology and the collection of data and analysis. Finally, the ethical aspects and validity and reliability of the research will be addressed.

#### **3.1. Research philosophy**

The main objective of this study is to determine to what extent there is a correlation between bicycle use and liveability; namely, if stronger and more engaged communities will tend to cycle more and vice versa. The nature of this study requires first understanding the dimensions that reflect the social and community dimensions of liveability, and later understanding the possible correlation between the variables while other possible influences are kept constant. Hence, this research was conducted within the positivist tradition, which tries to objectify and generalize a complex set of human behaviours and organize them into pattern. From this perspective it might be possible to argue that a quantitative approach may be effective for understanding the phenomenon.

#### **3.2. Research strategy**

First, an understanding of the theory of liveability and community related topics is needed in order to decide how to measure liveability. Knowledge about which indicators are best suited to determine the 'level' of liveability is necessary. To achieve this objective, relevant literature on liveability is reviewed together with literature on active modes of transport. Furthermore, a quantitative research approach is used in order to determine if there is a correlation between the use of active modes of transport and liveability. Each variable is measured separately for each person, and a correlation between the two variables is measured statistically. To avoid significant differences and to create a unified base line, the study focuses on one city and tries to see if differences can be found. The city of Amsterdam was chosen as a case study due to its relatively big size and its proximity to the location of the researcher.

Taking into consideration that human behaviour is a complex phenomenon, other variables are taken into account as possible influences on people's choice of transportation. Some other measures were already found to influence cycling behaviour. Social composition (Harms et. Al, 2014) gender, age and income level (Heesch et al., 2012; Harms et. Al, 2014) are measured together with the period of time during which the person has lived in the neighbourhood. This allows for a more realistic analysis to take place by taking into consideration, whenever possible, all the possible influences. The theory and data are examined together in order to accurately interpret the statistical findings.

### 3.3. Research methods

Liveability is measured with different tools and indicators depending on the purpose, location and scale of the study. Moreover, in some cases a description of liveability at a particular moment in time is provided and sometimes changes in liveability over a period of time are shown. The current investigation combines a case study model with a quantitative approach to evaluate the use of active modes of transport and the perception of participants about their neighbourhood and communities.

In order to understand cycling habits and the liveability of the city as perceived by its citizens, a self-reported survey was distributed. Individuals were asked to recall about their general habits and perceptions in a self-reported survey. The individuals' perspectives on their surroundings were chosen as the criteria for judging the quality of the surroundings.

A total of four variables were examined in the study. Liveability was divided into three variables, and these three variables were combined with "active transport," which constituted the fourth:

1. Cycling and walking habits
2. Liveability (which was divided into three subcategories):
  - a. Physical dimension
  - b. Engagement in local issues
  - c. Social relations

#### Respondents

The sample was composed of a research group of 71 participants (44 females and 27 males) between the ages 18-70, all of whom took part in this study on a voluntarily basis. The participants were chosen in a convenience sample. The participants were recruited through social media and in person on the streets. People who participated in the research through random meetings on the streets received a link to the questionnaires, which they answered online during their free time. Demographic data was collected to assess the possible control of confounding variables. The demographic description of the sample is presented in table 1. Data about family status, average income, education and time living in the neighbourhood is presented with frequencies and percentages from the research population.

Table 1: Frequencies and percentage of confounding variables

		total N (%)
<b>Age</b>	18-30	46 (64.8)
	30-50	22 (31.0)
	50-70	3 (4.2)
<b>Sex</b>	man	27 (38.0)
	woman	44 (62.0)
<b>Family status</b>	married	17 (23.9)
	single	54 (76.1)
<b>Average income per month (in Euro)</b>	0-1,551	33 (46.5)
	1,551-4,100	36 (50.7)
	4,000 +	2 (2.8)
<b>Education</b>	Middelbare school	3 (4.2)
	MBO	2 (2.8)
	Bachelor and HBO	32 (45.5)
	Master	29 (40.8)
	Gepromoveerd	5 (7.0)
<b>Time living in the neighbourhood</b>	less than a year	18 (25.4)
	1-5 years	28 (39.4)
	more than 5 years	25 (35.2)

### Instruments

One questionnaire consisting of two parts was composed in order to measure social aspects of liveability and collect data on bicycle use and walking habits of citizens in the city of Amsterdam.

The first part of the questionnaire (see Appendix 1) was presented accordingly to participants. It was used to assess people's cycling habits as a means of transport. People were asked to answer 9 multiple choices questions that relate to the use of cycling as a transportation method and the frequency that they used it as such. The questionnaires help to differentiate between different levels of users, from people who do not own bicycles or almost never use them, to people who use their bicycles every day for all their activities.

Walking habits were also collected. The score for cycling or walking was calculated in the following way, for people without children the score of question number 3 (“How often do you cycle in your daily routine?”) and question number 4 (“How often do you walk to a destination [to supermarket, work, to pick up the children, to friends, to bus/tram stop etc.]?”) was taken as it is. For people with children, a mean value was created to combine the scores of the two questions above together with the questions that address cycling or walking with children. The correlation between the two sub-questions about cycling and walking among the participants with children was found to be 0.66 and 0.26, respectively.

The second part of the questionnaire (see Appendix 1), includes 14 statements about liveability. The questions are rated on a five-point Likert-type scale ranging from “strongly disagree” to “strongly agree” (1- strongly disagree, 5- strongly agree). The questions are randomly organized and represent three sub dimensions which are included in liveability: **Physical dimension**, which refers to the perception of communal space and public facilities (“There is an active community centre in my neighbourhood, with a variety of activities”); **Engagement in local issues**, which refers to involvement in neighbourhood processes and community life, such as volunteering and one’s sense of responsibility over common spaces and issues (“I regularly volunteer in community projects or events”); and **Social relations**, i.e., the existence and quality of relationships between neighbours and a common sense of solidarity (“In case of a late night emergency I can call my neighbours for help”). Each dimension includes three to four statements. Three additional statements were added to assess the general satisfaction of participants with their neighbourhood. Some of the items are presented positively and some are presented negatively.

In order to evaluate the reliability of the liveability section of the questionnaire, a Cronbach  $\alpha$  test was conducted. This test measures the internal consistency of the questionnaire. It was found that the internal consistency values of “engagement in local issues” (Cronbach  $\alpha$ = 0.50) and “physical dimension” (Cronbach  $\alpha$ = 0.56) are sufficient but low, so caution should be taken when interpreting the results. The internal consistency of “social relations” (Cronbach  $\alpha$ = 0.59), “general satisfaction” (Cronbach  $\alpha$ = 0.81), and the whole questionnaire (Cronbach  $\alpha$ = 0.75) were found to be sufficient.

The questions in the questionnaire were influenced by the literature review, and the researcher’s experience. The questionnaire was examined by a group of experts for recommendations and improvement before being used.

In addition, confounding data was collected following the questionnaire. The participants were asked to answer multiple-choice questions about their age, gender, family status, average income, education, neighbourhood and the time that they had been living in the neighbourhood.

## **Procedure**

An online version of the questionnaires was made to help with distribution. The questions were translated to Dutch in order to increase the response among the local population. The questionnaires were spread online through social media and on the streets to passers-by who were given a link to the questionnaires, which they could fill out at home. The questionnaire was distributed in various locations around the city, addressing people from any neighbourhood in Amsterdam.

The purpose of the study and its course were explained to the participants verbally by the experimenter or by reading a short paragraph prior to their participation. In addition it was brought to the participant's attention that the current study was conducted by a Master's student at the Radboud University.

Each participant was asked to answer a questionnaire about transportation habits and liveability. After completing the questionnaire, all participants filled out a short demographic questionnaire (i.e. gender, age, family status, ethnicity, income and the location of the neighbourhood in which they live). They were given the option to leave their contact details in order to receive further information and the results of the research. There was no identification of participants during and after data collection. Any identifying details were coded and omitted from the analysis of results as well as from the final manuscript (dissertation). The data was not accessible to anyone but the researcher.

The hypotheses were examined with a Pearson correlation and a multiple regression analysis. Furthermore, they were considered in light of the literature analysis and previous knowledge about the topic.

### **3.4. Validity and reliability of the research**

Ethical research behaviour ensures that the rights of individuals and groups are respected, thus the individual right for privacy should be kept. Those principles are important for continued scientific inquiry (Hay, 2016). Anonymous and voluntarily answers of participants assure these principles.

As previously discussed, the research focuses on one city, at one point in time. The choice was made to focus on one city in a specific country in order to help minimize variables, such as cultural differences, weather and infrastructure that might influence the choice to cycle as a means of transport.

A third variable may influence both of the investigated variables. Or, the correlation might be explained as an outcome of self-selection, people who like to walk and cycle may choose to live in specific neighbourhoods and have specific characteristics. However, in order to assure that the results are reliable, different variables that were found to influence the use of active modes of transport or levels of liveability in previous studies were taken into

consideration while assessing the correlation between the investigated variables; age, gender, level of education, family status, income and time living in the neighbourhood were all taken into consideration. As a result, the questionnaires used in this study were built especially for the project. A small pilot project preceded that larger investigation. After the pilot project, the questionnaire was given to small group of people for comments and to help adjust the questions before they were used in the actual research.

The data collected remains anonymous, and is used statistically to evaluate the correlation between the two variables. The evaluation is not intended to judge whether a neighbourhood is a good place to live, but as a way to clarify the specific correlation with non-motorized transportation.



#### 4. Results

In this chapter, the statistical analysis of the collected data is presented. In section 4.2, I present descriptive statistics of the research variables. In section 4.3 the correlations between active modes and liveability are presented. A regression analysis that defines the direction of the relations between the variables is presented in section 4.4.

##### 4.1. Descriptive statistics

69% of the participants indicated that they are using a bicycle every day for day-to-day purposes, as shown in Table 2. Some of them (31%) also indicated that they walk daily to achieve their needs. Generally, 83% of the participants cycle, walk, or engage in both at least once a week for transport. None of the participants indicated that they never cycle, although 13% said they cycle less than two times per week. Among the participants who have children (18%), about 38% cycle with their children one to two times per week, and about 33% walk with their children to school or in the neighbourhood. Generally, the most common mode of transportation for travelling to work was cycling (59%). 18% said that they use public transportation (tram, bus, train and metro), and 15.5% said they use a car in order to get to work.

Table 2: Cycling and walking frequencies

		Number	Percent (%)
<b>Frequency of cycling</b>	Never	0	
	Less than 1 time a week	6	8.5
	1 to 2 times a week	3	4.5
	More than 3 times a week	13	18.8
	Every day	49	69.0
<b>Cycling with children</b>	Never	3	4.2
	Less than once a week	1	1.4
	1 to 2 times a week	5	7.0
	More than 3 times a week	1	1.4
	Every day	3	4.2
	No children	58	81.7
<b>Frequency of walking</b>	Never	3	4.2
	Less than once a week	10	14.1
	1 to 2 times a week	15	21.1

	More than 3 times a week	21	29.6
	Every day	22	31.0
<b>Walking with children</b>	Never	2	2.8
	Less than once a week	1	1.4
	1 to 2 times a week	4	5.6
	More than 3 times a week	3	4.2
	Every day	2	2.8
	No children	59	83.1
<b>Preferable mode to work</b>	No work	4	5.6
	Cycling	42	59.2
	Public transportation	13	18.3
	Car	11	15.5
	Walking	1	1.4

A score for cycling or walking was calculated for each participant. For people who stated that they have children, an average score for cycling or walking was calculated using two questions addressing walking and the two questions addressing cycling. The score for people without children remained the same as the value of the questions asking about the frequency of cycling or walking (for further explanation see section 3.3). The minimum and maximum values together with mean values and standard deviation of those average scores are presented in table 3.

Generally, cycling was found to be slightly more common than walking among the respondents as seen in table 3.

The correlation between cycling and walking was found to be negative and not statistically significant with  $r = -.038$ . For this reason, a variable of average cycling and walking will not be used.

Table 3: Mean values and Pearson correlation between average cycling and walking

	Minimum	Maximum	Mean (SD)	Walking
<b>cycling</b>	0.5	4	3.38 (1.001)	-0.038
<b>walking</b>	0	4	2.64 (1.15)	

The mean values together with the minimum and maximum values of the different dimensions of liveability and general liveability were calculated as shown in table 4. The mean value of “general satisfaction” was found to be the highest among the dimensions of liveability (M=4.13). On the contrary, the mean value of perception of the “physical dimension” was found to be 2.69, and the lowest of the variables.

Next, a Pearson correlation was examined among the different dimensions of liveability and between the different dimensions and total score of liveability. All the correlations are positive and most of them were found to be statistically significant. The correlation between the “physical dimension” and the “social dimension” and “engagement in local issues” was not found to be statistically significant.

Liveability is the mean value of all other dimensions; thus, there is no need to measure its correlation with the other dimensions. A positive and significant correlation was found between “general satisfaction” and the other dimensions (“social relations,” “physical dimension” and “engagement in local issues”). The strongest correlation was found with the social relations  $p=0.49$ , and the weakest with engagement in local issues  $p=0.38$ . Besides that, a positive significant correlation between social relations and engagement in local issues was found ( $p=0.31$ ). One can therefore conclude that the different dimensions of liveability address different and complementary aspects.

Table 4: Mean values, SD and Pearson correlation among liveability scales and liveability

	Min imu m	Maxi mum	Mean (SD)	Social relation s	Physical dimensio n	Engagement in local issues	General satisfactio n
<b>Social relations</b>	1	5	3.76 (0.88)		0.17	0.317**	0.498**
<b>Physical dimension</b>	1	5	2.69 (0.71)			0.162	0.243*
<b>Engagement in local issues</b>	1	4.5	3.49 (0.62)				0.388**
<b>General satisfaction</b>	1	5	4.13 (0.84)				
<b>Liveability</b>	1.2	4.5	3.4 (0.55)				

\*\*  $p<0.01$  \* $p<0.05$

#### 4.2. Correlation between liveability and active modes

In this section, I present the result of the correlation analysis between active modes and liveability. For this purpose, the following variables are used: the average cycling and walking scores, the different dimensions of liveability, and the general measure of liveability.

Table 5: Pearson correlations between cycling or walking and liveability

	Cycling	Walking
<b>Social relations</b>	0.117	<b>0.269*</b>
<b>Physical dimension</b>	0.128	-0.64
<b>Engagement in local issues</b>	<b>0.372**</b>	0.31
<b>Satisfaction</b>	<b>0.321**</b>	0.185
<b>Liveability</b>	<b>0.330**</b>	0.129

\*\*  $p < 0.01$  \*  $p < 0.05$

Positive and significant correlations were found between cycling on the one hand, and engagement in local issues, satisfaction, and the total score for liveability on the other hand (table 5). Namely, a greater frequency of cycling was correlated with greater engagement in local issues, higher satisfaction, and generally, with a greater total score for liveability. Frequency of walking was positively related with social relations. A greater frequency of walking was correlated with higher levels of social relationships in the neighbourhood. A negative correlation between physical dimension and walking was found. In other words, an increase in walking goes hand in hand with a decrease in satisfaction with open spaces in the neighbourhood, and greater feelings that it is unpleasant to walk in the streets.

#### 4.3. Regressions analysis between active modes and liveability

In this section, I present the results of a regression analysis between active modes and liveability and the inverse relationship. The goal of the analysis is to find out the direction of the correlation between the research variables.

In this study I chose to employ four regression models (table 6). The first checks whether the different dimensions of liveability influence levels of cycling or walking. The second predicts whether liveability influence cycling or walking. And the third and fourth check whether cycling or walking influences levels of the different dimensions of liveability, and liveability in general.

Table 6: Variables in regression analysis

	Independent variables	Dependent variables				
		Cycling	Walking			
<b>Regression 1,2</b>	Age					
	Gender					
	Education	+				
	Income	-				
	Seniority in neighbourhood					
	<b>Social relations</b>					
	<b>Physical dimension</b>					
	Engagement in local issues	+				
	<b>Satisfaction</b>					
	Liveability	+				
		Liveability	Social relations	Physical dimension	Engagement in local issues	Satisfaction
<b>Regression 3,4</b>	Age					-
	Gender					
	Education	-	-		-	
	Income	+	+			
	Seniority in neighbourhood	+				
	<b>Cycling</b>	+	+		+	+
	<b>Walking</b>					

Prior to assessing the regression models, Pearson correlations were calculated between the study variables and the confounding variables to see if the relationships expected from the literature review exist. Table 7 presents these correlations. It shows negative and significant correlations between age and both cycling and satisfaction; younger ages are related with more cycling and higher satisfaction. Furthermore, a negative and significant correlation was found between average incomes and cycling; so that lower incomes are related to higher rates of cycling. Given these correlations, age and average income levels are controlled in the regression analyses, together with gender, education, and seniority in the neighbourhood.

Since the correlation between cycling and walking is not statistically significant, they were not added to the regression models as controlled variables.

Table 7: Pearson correlations between confounding variables and the study variables

	Family status	Time living in the neighbourhood	Average income (per month)	Education	Age	Sex
<b>Cycling</b>	-0.231	-0.076	<b>-0.312**</b>	0.199	<b>-0.315**</b>	0.007
<b>Walking</b>	-0.04	-0.039	0.099	-0.115	0.012	-0.121
<b>Social dimension</b>	0.129	0.013	0.170	-0.082	-0.056	-0.156
<b>Physical dimension</b>	0.007	0.119	0.138	-0.003	-0.036	-0.054
<b>Engagement in local issues</b>	-0.073	0.001	-0.216	-0.116	-0.151	0.009
<b>Satisfaction</b>	-0.011	0.030	0.063	0.087	<b>-0.298*</b>	-0.018
<b>Liveability</b>	0.068	0.138	0.099	-0.056	-0.131	-0.027

\*\*  $p < 0.01$  \*  $p < 0.05$

The first two multiple hierarchical regressions were conducted in order to check whether the different dimensions of liveability and the total score of liveability predict levels of cycling or walking (tables 8 and 9).

In the first regression model (table 8), age, gender, education, income level and seniority in the neighbourhood were entered into the regression model in the first step as control variables. Age is a continuous variable, and the other variables were entered dichotomously as dummy variables: gender (0- females, 1-males), education (0- up to BA, 1- MA and PhD), income level (0- up to 1550 per month, 1- over 1550 per month) and seniority in the neighbourhood (0- up to 5 years, 1- over 5 years).

At second step, the different dimensions of liveability (social, physical, engagement in local issues and satisfaction) were entered to the regression model. The regression model was found to be significant for cycling, with 37% of the variance in cycling being explained in the model. Only income level and education were found to be a significant predictor, with higher education and lower income levels being related to greater frequencies of cycling. In addition, engagement in local issues was found to be a significant positive predictor, showing that greater engagement is related to greater frequencies of cycling.

In the second regression model (table 9), as in the first model, age, gender, education, income level and seniority in the neighbourhood were entered at the first step as control variables. At the second step, the total score of liveability was entered into the regression model. The regression model was found to be significant for cycling, with 37% of the

variance in cycling being explained by liveability. In other words, a greater liveability score is related to greater cycling frequency.

In both of the models walking was not found to be significant; that is, walking is not predicted by liveability and its dimensions.

Table 8: Predicting cycling and walking with liveability dimensions

	Cycling			Walking		
	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$
<b>Step 1</b>						
<b>Age</b>	-.024	.012	-.276	-.002	.015	-.023
<b>Gender</b>	.074	.227	.036	-.302	.293	-.127
<b>Education</b>	.475	.226	.239*	-.196	.292	-.085
<b>Income</b>	-.617	.223	-.309**	.385	.288	.167
<b>Seniority in neighbourhood</b>	.066	.271	.032	.108	.350	.045
<b>R<sup>2</sup></b>		.23**			.04	
<b>Step 2</b>						
<b>Age</b>	-.012	.012	-.140	.004	.016	.039
<b>Gender</b>	.078	.218	.038	-.252	.297	-.106
<b>Education</b>	.618	.226	.311**	-.162	.308	-.070
<b>Income</b>	-.636	.228	-.319**	.268	.312	.116
<b>Seniority in neighbourhood</b>	-.132	.264	-.063	.050	.361	.021
<b>Social relations</b>	.093	.147	.082	.237	.200	.181
<b>Physical dimension</b>	.130	.151	.093	-.242	.206	-.149
<b>Engagement in local issues</b>	.419	.193	.263*	-.085	.263	-.046
<b>Satisfaction</b>	.118	.162	.100	.216	.221	.158
	R <sup>2</sup> = .37,			R <sup>2</sup> = .12,		
	F(9, 61) = 3.93, p < .001			F(9, 61) = 0.93, p = .506		

\*  $p < 0.05$  \*\*  $p < 0.01$

Table 9: Predicting cycling and walking with total liveability score

	Cycling			Walking		
	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$
<b>Step 1</b>						
<b>Age</b>	-.024	.012	-.276*	-.002	.015	-.023
<b>Gender</b>	.074	.227	.036	-.302	.293	-.127
<b>Education</b>	.475	.226	.239*	-.196	.292	-.085
<b>Income</b>	-.617	.223	-.309**	.385	.288	.167
<b>Seniority in neighbourhood</b>	.066	.271	.032	.108	.350	.045
<b>R<sup>2</sup></b>		.23**			.04	
<b>Step 2</b>						
<b>Age</b>	-.012	.011	-.140	.001	.016	.011
<b>Gender</b>	.083	.207	.041	-.299	.294	-.126
<b>Education</b>	.621	.210	.312**	-.153	.298	-.066
<b>Income</b>	-.770	.207	-.386***	.340	.295	.147
<b>Seniority in neighbourhood</b>	-.205	.257	-.098	.029	.365	.012
<b>Liveability</b>	.723	.191	.401***	.212	.272	.102
	R <sup>2</sup> = .37,			R <sup>2</sup> = .05,		
	F(6, 64) = 6.29, p < .001			F(6, 64) = 0.60, p = .726		

\*  $p < 0.05$  \*\*  $p < 0.01$ 

The third and fourth multiple hierarchical regressions were conducted in order to check whether cycling or walking predict levels of liveability or its dimensions (table 10).

At the first step, age gender, education, income level and seniority in the neighbourhood were entered to the regression model as control variables. Cycling and walking were entered at the second step. The regression was measured for each one of the dependent variables (liveability and dimensions of liveability) separately.

The model was found to be significant for the total liveability score, engagement in local issues, social relations and general satisfaction with the neighbourhood. 29% of the variance in liveability, 22% in social relations, 24% of the variance in the variable “engagement in local issues” and 26% of the variance in “general satisfaction” were explained by walking



and cycling. Cycling only (and not walking) was found to be positively and significantly related with the above four variables (liveability, engagement in local issues, social relations and satisfaction), beyond age, gender, education, income level and seniority in the neighbourhood. In other words, greater frequencies of cycling are related to greater satisfaction with the neighbourhood, higher levels of engagement in local issues, greater social relations, and generally, greater levels of liveability.

The model regarding the physical dimension is not significant. This means that there is no statistical relation between walking or cycling for transport and the satisfaction of citizens with open spaces in the neighbourhood, a pleasant feeling to walk in the neighbourhood, and proximity to daily needs.

Table 10: Predicting liveability with cycling and walking

	Liveability			Social relations			Physical dimension		
	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$
<b>Step 1</b>									
<b>Age</b>	-.017	.007	-.341*	-.012	.011	-.157	-.011	.009	-.171
<b>Gender</b>	-.012	.134	-.011	-.266	.214	-.147	-.095	.179	-.065
<b>Education</b>	-.203	.134	-.184	-.378	.214	-.215	-.060	.178	-.043
<b>Income</b>	.211	.132	.191	.474	.211	.269*	.248	.176	.175
<b>Seniority in neighbourhood</b>	.374	.160	.324*	.231	.256	.125	.342	.213	.230
<b>R<sup>2</sup></b>		.13			.12			.06	
<b>Step 2</b>									
<b>Age</b>	-.010	.006	-.214	-.006	.011	-.079	-.007	.009	-.116
<b>Gender</b>	-.019	.124	-.017	-.237	.207	-.131	-.127	.179	-.087
<b>Education</b>	-.314	.127	-.285*	-.459	.212	-.261*	-.144	.183	-.102
<b>Income</b>	.352	.129	.318**	.559	.217	.317*	.366	.187	.257
<b>Seniority in neighbourhood</b>	.353	.147	.306*	.199	.246	.108	.340	.212	.229
<b>Cycling</b>	.251	.067	.452***	.233	.112	.264*	.148	.097	.208
<b>Walking</b>	.038	.052	.079	.153	.087	.201	-.068	.075	-.111
	R <sup>2</sup> = .29, F(7, 63) = 3.71, p = .002			R <sup>2</sup> = .22, F(7, 63) = 2.51, p = .024			R <sup>2</sup> = .11, F(7, 63) = 1.07, p = .391		

\*  $p < 0.05$  \*\*  $p < 0.01$

Table 10 continued: Predicting liveability with cycling and walking

	Engagement in local issues			Satisfaction		
	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$
<b>Step 1</b>						
<b>Age</b>	-.013	.008	-.241	-.033	.010	-.445**
<b>Gender</b>	.084	.153	.065	-.012	.201	-.007
<b>Education</b>	-.265	.153	-.212	.089	.200	.053
<b>Income</b>	-.199	.151	-.159	.220	.198	.130
<b>Seniority in neighbourhood</b>	.181	.183	.138	.472	.240	.268
<b>R<sup>2</sup></b>		.11			.16*	
<b>Step 2</b>						
<b>Age</b>	-.007	.008	-.129	-.027	.010	-.359*
<b>Gender</b>	.071	.146	.055	.008	.194	.004
<b>Education</b>	-.381	.149	-.304*	-.004	.198	-.003
<b>Income</b>	-.051	.152	-.041	.326	.202	.193
<b>Seniority in neighbourhood</b>	.162	.172	.124	.442	.230	.251
<b>Cycling</b>	.252	.079	.401**	.249	.105	.294*
<b>Walking</b>	.020	.061	.037	.125	.081	.171
	R <sup>2</sup> = .24,			R <sup>2</sup> = .26,		
	F(7, 63) = 2.82, p = .013			F(7, 63) = 3.13, p = .007		

\*  $p < 0.05$  \*\*  $p < 0.01$

## 5. Discussion, conclusion and reflection

### 5.1. Introduction

Human behaviour and personal choices are influenced by many factors; therefore, evaluating “how people experience their neighbourhood” is a complex task. The variables examined in the study were influenced by the relevant literature, and the interpretation of the findings is done in light of previous studies. This chapter will address the results in light of the research questions.

### 5.2. Conclusions

We can see that some of the hypothesis were accepted, or partially accepted, and some were rejected (Chart 1 and 2). This makes the general conclusion about the relation between liveability and active modes of transport complex and inconclusive.

Chart 1: Social liveability predicting cycling and walking

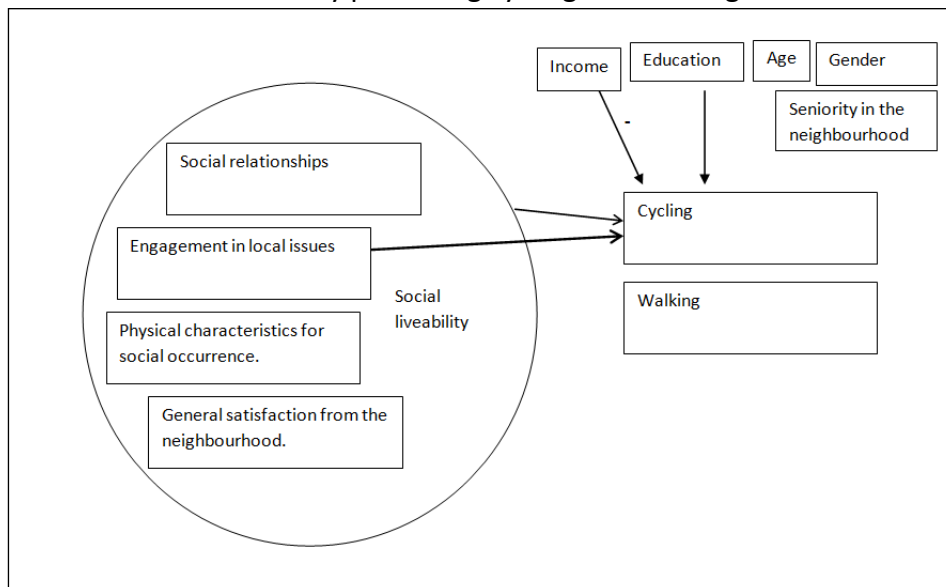
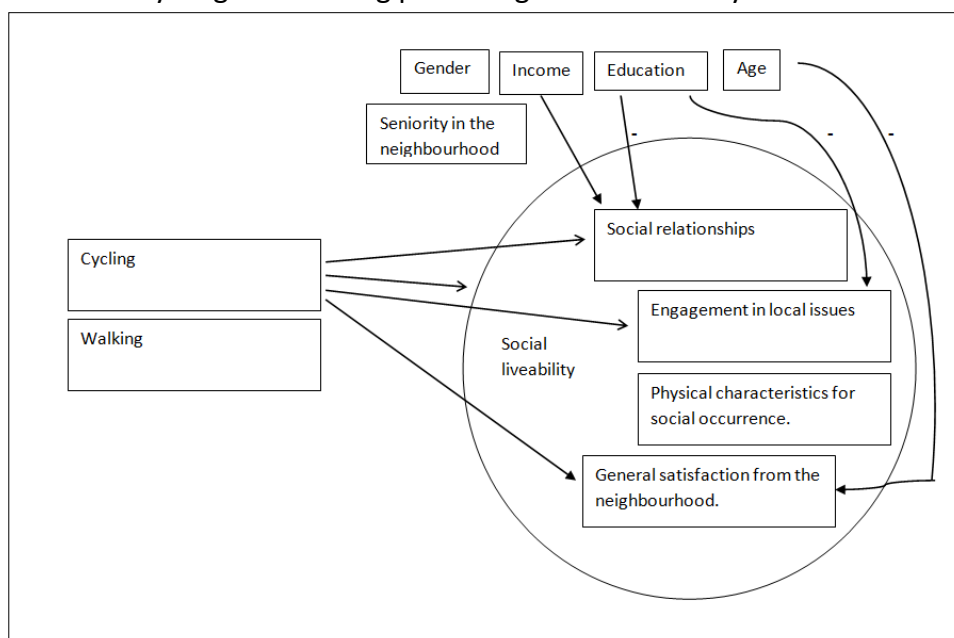


Chart 2: Cycling and walking predicting Social liveability



The research hypothesis that cycling or walking as means of transport is positively correlated with engagement in local issues was partially accepted. A positive correlation was found between cycling and engagement in local issues. This means that people who cycle more tend to be more engaged in local decisions and processes and vice versa. Walking, on the other hand, was not found to be related with engagement in local issues. Thus, we can say that people who cycle more as transport tend to be more involved in local issues and more invested in what happens to the physical and social common spaces. Furthermore, more engaged communities cycle more often.

Age was found to be negatively correlated to cycling, meaning that, in the population over 18, younger people tend to cycle more. Those findings are supported by the literature (Centraal Bureau voor de statistiek, 2015). Furthermore, it was found that income level is negatively correlated with cycling; meaning that, people with relatively low levels of income were found to use bicycles more frequently. The results on this matter partially coincide with the literature on the topic; since some previous research found that in countries such as the Netherlands, there are only minor differences in levels of cycling across income groups (Pucher & Buehler, 2008).

The relation between cycling and engagement in local issues exists regardless of the correlation between cycling and age and income. Thus, it can be assumed that people who use their bicycle more frequently consider themselves to be more involved in community projects or neighbourhood committees independent of age and income. Cycling in the neighbourhood creates less distance between the person and the street. Being in the street, as opposed to being in a car, might result in a transformation of the individual's perception of the common space. Rather than think of public spaces as not belonging to anyone, cyclists perceive them as belonging to everyone. This is a possible explanation for the greater sense of responsibility for the public space that cyclists report (Hardin, 2003). It is also possible that people who care more about their surroundings to begin with are more likely to cycle and will therefore be more involved in the community. This would mean that a third variable influences them both. People choose to cycle more often when they could reach most of their needs in their neighbourhood (Saelens et al., 2003), thus they spend more time locally, and are more exposed to "what happens in the neighbourhood". This experience might influence them to contribute to the development and maintenance of the neighbourhood.

The second research hypothesis—that the use of cycling or walking as a means of transport positively correlates with social relations in the neighbourhood—was partially excepted. After running a regression model without confounding variables, a relation between walking and social relations is seen; however, it is not statistically significant. But, after adding the confounding variables, a relation is seen only with cycling. Meaning that greater cycling is related to greater social relations. D. Appleyard's (1981) previous findings confirm the notion that when people walk more they tend to know more of their neighbours by name,

feel free to ask for help and generally have stronger social relationships in the neighbourhood. One explanation for the positive findings of previous studies regarding walking, compared with this study is, the low number of participants in the study. Furthermore, an even smaller proportion of the small starting sample size stated that they walk for day-to-day needs.

As we expected, greater frequencies of cycling were found to be related to more and better social relations. This goes together with the literature, that shows that, slow traffic is generally found to be related to increases in social relations (D. Appleyard, 1981). One reason for this is that people who move through their neighbourhoods slowly have greater chances of meeting others.

Cycling and walking are both slow means of transport, that can facilitate meeting others on the street to a great extent. Although cycling, as opposed to walking, does not allow for conversation and travel to take place simultaneously, it was found to be related to greater social relations. Thus, we can argue that walking, opposed to the statistical findings can be seen as well as a motivator to social relations together with cycling.

Social relations were not found to influence levels of cycling and walking. Still, it is interesting to look into the possible relationship between the variables. Social norms regarding cycling, specifically, are found to influence the individual's choice to cycle (Eriksson and Forward, 2011). But social relations (quantity and quality) as measured in this study were not found to influence the use of bicycles for transport. The quantity and quality of relations between neighbours ("How many neighbours do you know by name?" "Can you ask your neighbours for help?") does not indicate an effect on cycling.

The third hypothesis—that cycling or walking are positively correlated with sense of satisfaction with the physical dimensions of the neighbourhood (public spaces, proximity to daily needs, pleasant feeling walking in the neighbourhood)—was not accepted. A significant correlation was not found between the two variables. One possible explanation for the findings is that the internal Cronbach of the questions, which measure the physical dimension, was found to be relatively low. The implication is that the questions do not strongly measure the same thing. That might influence the findings.

Levels of cycling were found to influence people's general satisfaction with their neighbourhood. In other words, greater cycling frequency positively influences the positive feelings people have about their neighbourhood. Walking, on the other hand, is not found to be correlated with general satisfaction or liveability. Liveability is the average of its components (social relations, engagement in local issues and physical dimensions) together with general satisfaction. So, although it was found to be positively related to cycling (and not walking) and vice versa, in light of the other findings, it can only be said that it is partially related to cycling.

Research shows that cycling has positive influence on quality of life (Wardman, 2007). It offers positive environmental impacts (Rojas-Rueda, 2011; Maibach, 2009 ) and has a

positive influence on health (Pate et al., 1995). From this study we can see that cycling encourages greater engagement, or a greater will to be involved, in issues that affect the life in the neighbourhood. Furthermore, greater engagement leads to greater frequencies of cycling for transport. From this finding, we can see the importance of promoting cycling in order to promote liveable engaged community. Moreover, since engagement in local issues was found to positively impact levels of cycling, policies that support the engagement of citizens in local issues can indirectly lead to more cycling (a clean means of transport).

In the discussion of the liveability of streets, it is clear that different age groups rate different aspects as important to the liveability of the street and the neighbourhood (Appleyard, B. S., 2005). This study addresses the adult population and specific aspects of liveability. As such, it can only be said that liveability for adults is influenced by levels of cycling, and especially levels of social engagement and the will to influence “what happens in my neighbourhood”.

The role of planners is, in my opinion, to create sustainable living environments for people, while trying to keep a balance between man and nature. Thus, some steps need to be taken in order to understand how planning decisions affect people in the present and how they will continue to affect communities over time.

A community, as addressed in this research, is located in the neighbourhood. The neighbourhood is the daily, immediate, functional and sometimes social platform for communal occurrences. A community that has the power to stand behind its interests, lead development that suits its needs and give social support will be more sustainable for the present and the future. Bottom up processes and development have been demonstrated to be long lasting and successful (Michels & De Graaf, 2010). The relation between a sense of responsibility and involvement in communal life in the neighbourhood and cycling for transport is a starting point for further investigation of how to create a sense of community in cities and encourage sustainable growth.

It can be interesting for further research to look closely into the role of community engagement in the long term processes in the neighbourhood, that effect liveability. Together with looking at the different spatial catalysts for social engagement. This can be looked at over time in a city that is yet developing in the topic of cycling as transport.

### 5.3. Reflection

It is important to reflect upon the weaknesses and strengths of the study in light of practical, theoretical and personal choices that were made. Those choices influence the design and outcome of the research, and, thus, should be discussed. First of all, this research was chosen to be a quantitative study that focused on the city of Amsterdam, in order to minimize the impact of variables such as weather and culture. However, undertaking a study outside of the laboratory is vulnerable to many unexpected factors. Confounding

variables were collected, but it is impossible to grasp all the elements that influence cycling and walking.

Some of the factors that were not included in the research are car ownership, proximity to public transport, and the residential location of the respondents. The last, was collected during the research but was not included in the analysis. Some of the data was missing, and the wide range of neighbourhoods of participants made it difficult to include this variable. Maybe it could have been easier to focus on specific neighbourhoods in the city, chosen for the research. Or, to use a bigger sample (more participants), to allow more participants from each neighbourhood.

Perceptions related to safety greatly influence the way in which individuals evaluate their communities (Leby & Hashim, 2010). Although safety was not included as a direct variable, it was considered as part of the perception of physical space and as an outcome of a good social life in the neighbourhood.

In this kind of research, where human behaviour is being investigated together with personal perceptions, a mixed method could have provided a better understanding of the phenomena that were being investigated. Half-structured interviews together with the questionnaire might have helped to fill in the gaps of understanding. Second, the primary investigator composed the questionnaires, and they were inspired by questionnaires used in previous studies. Although a group of experts reviewed the questionnaires before they were used, a pilot study or the use of existing questionnaires could have helped to increase the validity of the tool.

When speaking with participants after they filled out the questionnaires, I became aware of a few particular issues. First, the limitation of the multiple-choice format that did not allow participants to answer the questions accurately. Sometimes participants chose answers that did not reflect their particular experience because they lacked a more appropriate choice. For example, differences in bicycle use between winter and summer were not included in the questionnaire. This lacuna made it harder to evaluate the answers. Second, questions such as “who are your neighbours?” proved to be ambiguous. Some subjects only consider the people in their building as neighbours, whereas others extend the title to the people that live on their street or in their neighbourhood.

Furthermore, the proposed schedule for completing this thesis did not match the time it required in reality. The process of collecting data took more time than the research proposal accounted for. This caused disruptions in the schedule.

Last but not least, this study looks at community on the level of the neighbourhood. In this sense community is tied to a certain physical place. As I worked on the thesis, I was confronted with the question of what constitutes a community, and I began to question the roles of community in our lives. I was left with many doubts regarding the ways in which the

term liveability is relevant to communities that exist in a digital era and that form beyond the physical space.



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**Appendix 1- Questionnaire**

## Part one- Transportation habits

1. Do you own your own bicycle? Yes\no
2. How often do you cycle in your daily routine?
  - a. Every day
  - b. More than 3 times a week
  - c. 1 or 2 times a week
  - d. Less than once a week
  - e. Never
3. How often do you walk to a destination (to supermarket, work, to pick up the children, to friends, to bus/tram stop etc.)
  - a. Every day
  - b. More than 3 times a week
  - c. 1 or 2 times a week
  - d. Less than once a week
  - e. Never
4. Do you cycle with your children in the neighbourhood (or to school)?
  - a. Every day
  - b. More than 3 times a week
  - c. 1 or 2 times a week
  - d. Less than once a week
  - e. Never
  - f. I do not have children
5. Do you walk with your children in the neighbourhood (or to school)?
  - a. Every day
  - b. More than 3 times a week
  - c. 1 or 2 times a week
  - d. Less than once a week
  - e. Never
  - f. I do not have children
6. In order to get to work, I usually use (choose the most suitable answer)
  - a. Public transportation (trun, train, bus)
  - b. Private car
  - c. Taxi (or Uber)
  - d. Bicycle
  - e. Walking

## Part two-Community liveability

The coming questions are addressing the neighbourhood which you live in.

Please choose the level in which you agree or disagree with the following statements (1- strongly disagree, 5- strongly agree)

- |  |           |
|--|-----------|
| 1. There are public open spaces for all ages in the neighbourhood  | 1 2 3 4 5 |
| 2. I feel at home in my neighbourhood  | 1 2 3 4 5 |
| 3. I am/ I would have liked to be part of my neighbourhood committee   | 1 2 3 4 5 |
| 4. If I could, I would choose to move away from my neighbourhood   | 1 2 3 4 5 |
| 5. I know my neighbours by name  | 1 2 3 4 5 |
| 6. I find it unpleasant to walk around the neighbourhood   | 1 2 3 4 5 |
| 7. In case that a development plan is occurring in my neighbourhood<br>(redesign of the street or a public space ), I want to voice my opinions about such project | 1 2 3 4 5 |
| 8. I feel <u>uncomfortable</u> to ask my neighbours for a product, like a cup of sugar, or coffee in<br>case I run out of these things?                            | 1 2 3 4 5 |
| 9. In case of a late night emergency I can call my neighbours for help   | 1 2 3 4 5 |
| 10. I regularly volunteer in community projects or events  | 1 2 3 4 5 |
| 11. when I see children play outside, I will watch them as they where my own   | 1 2 3 4 5 |
| 12. I can fulfil most of my daily needs<br>(food, education, leisure etc) in the neighbourhood   | 1 2 3 4 5 |
| 13. My neighbourhood offers high quality of life   | 1 2 3 4 5 |

## Part three- demographic data

Age: 0-18 / 18-30 / 30-50 / 50-70 / 70+

Gender: Female / Male / other

Family status: Married / single / single mother or dad

In which neighbourhood do you live?

[Binnenstad/Burgwallen](#) ([Oude Zijde](#) - [Nieuwe Zijde](#))[Grachtengordel](#) (Canal Belt) ([Negen Straatjes](#))[Haarlemmerbuurt](#)[Jodenbuurt](#)[Jordaan](#)[Kadijken](#)[Lastage](#)[Nieuwmarkt](#)[Oostelijke Eilanden](#) / [Czaar Peterbuurt](#)[Oosterdokseiland](#)[Plantage/Weesperbuurt](#)[Rapenburg](#)[Uilenburg](#)[Westelijke Eilanden/Gouden Reael](#)[Geuzenveld](#) ([De Eendracht](#))[Nieuw Sloten](#)[Oostoever](#)[Osdorp](#) ([De Aker](#)/[Middelveldsche Akerpolder](#))[Oud Osdorp](#)[Overtoomse Veld](#)[Sloten](#) (village)[Slotermeer](#)[Slotervaart](#)[Banne Buiksloot](#)[Buiksloot](#)[Buikslotermeer](#)[Floradorp](#)[Kadoelen](#)[Landelijk Noord](#) ([Durgerdam](#) - [Holysloot](#) - [Ransdorp](#) - [Schellingwoude](#) - [Zunderdorp](#))[Molenwijk](#)[Nieuwendam](#)[Nieuwendammerdijk en Buiksloterdijk](#)[Oostzanerwerf](#)



[Overhoeks](#)

[Tuindorp Nieuwendam](#)

[Tuindorp Oostzaan](#)

[IJburg](#) ([Haveneiland](#) - [Rieteilanden](#) - [Steigereiland](#) - [Zeeburgereiland](#))

[Indische Buurt](#)

[Oostelijk Havengebied \(Eastern docklands\)](#) ([Borneo-eiland](#) - [Cruquiseiland](#) - [Java-eiland](#) - [KNSM-eiland](#) - [Oostelijke Handelskade](#) - [Sporenburg](#))

[Oostpoort](#)

[Oud-Oost](#) ([Dapperbuurt](#) - [Oosterparkbuurt](#) - [Transvaalbuurt](#) - [Weesperzijde](#))

[Watergraafsmeer](#) ([Amsteldorp](#) - [Betondorp](#) - [Omval](#) - [Science Park Amsterdam](#))

[De Baarsjes](#) ([Admiralenbuurt/Mercatorbuurt](#) - [Chassébuurt](#) - [Trompbuurt](#))

[Bos en Lommer](#) ([Kolenkitbuurt](#) - [Landlust](#))

[Frederik Hendriksbuurt](#)

[Houthaven](#)

[Oud-West](#) ([Kinkerbuurt](#) - [Overtombuurt](#))

[Sloterdijk](#) (village)

[Spaarndammerbuurt](#)

[Staatsliedenbuurt](#)

[Waterwijk](#)

[Westerpark \(non-residential area\)](#)

[Zeeheldenbuurt](#)

[Apollobuurt](#)

[Buitenveldert](#)

[Hoofddorppleinbuurt](#)

[Museumkwartier \(Duivelseiland\)](#)

[De Pijp](#) ([Oude Pijp](#) - [Nieuwe Pijp](#) - [Diamantbuurt](#))

[Prinses Irenebuurt](#)

[Rivierenbuurt](#)

[Schinkelbuurt](#)

[Stadionbuurt](#) ([Olympisch Kwartier](#))

[Vondelpark](#) (park)

[Willemspark](#)

[Zuidas](#)

[Bijlmer](#)

[Bullewijk](#)

[Driemond](#) (village)

[Gaasperdam](#)

[Venserpolder](#)

[Sloterdijk \(business district\)](#) ([Teleport](#))

[Westelijk Havengebied](#) (harbor area) ([Ruigoord](#))

For how long do you live in the neighbourhood? Less than a year / 1 year- 5 years / more than 5 years

Average income per month: less than 1,551/ 1551-4,100 / more than 4,000

Years of education: High school education/Bechlore degree/ Master degree/ Phd

## Translation in Dutch

1. Ben je de eigenaar van je fiets? Ja/nee
2. Hoe vaak fiets je gemiddeld per dag?
  - a. Elke dag
  - b. Meer dan 3 keer per week
  - c. 1 of 2 keer per week
  - d. Minder dan 1 keer per week
  - e. Nooit
3. Hoe vaak loop je naar je bestemming? (bijvoorbeeld naar de supermarkt, werk, om de kinderen op te halen, om vrienden te bezoeken, de bus/tram te nemen etc.)
  - a. Elke dag
  - b. Meer dan 3 keer per week
  - c. 1 of 2 keer per week
  - d. Minder dan 1 keer per week
  - e. Nooit
4. Hoe vaak fiets je met je kinderen in de directe omgeving van de woning? (bijvoorbeeld naar school, naar een winkel of naar familie of vrienden)
  - a. Elke dag
  - b. Meer dan 3 keer per week
  - c. 1 of 2 keer per week
  - d. Minder dan 1 keer per week
  - e. Nooit
  - f. Ik heb geen kinderen
5. Hoe vaak loop je met je kinderen in de directe omgeving van de woning? (bijvoorbeeld naar school, naar een winkel of naar familie of vrienden)
  - a. Elke dag
  - b. Meer dan 3 keer per week
  - c. 1 of 2 keer per week
  - d. Minder dan 1 keer per week
  - e. Nooit
  - f. Ik heb geen kinderen
6. Als ik naar mijn werk ga, dan gebruik ik meestal de volgende optie: (kies het antwoord dat het beste je situatie weergeeft)
  - a. Openbaar vervoer (bus, tram, metro, trein etcetera)
  - b. Auto
  - c. Taxi (incl. bijvoorbeeld Uber)
  - d. Fiets
  - e. Lopen
  - f. Ik heb geen werk

De volgende vragen gaan over de wijk waar je woont.

Kies de mate waarin je het eens of oneens bent met de volgende uitspraken

(1- Heel erg mee oneens, 5- heel erg mee eens)

- |   |           |
|---|-----------|
| 1. Er zijn vrij toegankelijke openbare ruimtes voor alle leeftijden in de wijk (bijvoorbeeld een park, een plein)   | 1 2 3 4 5 |
| 2. Ik voel me thuis in de wijk  | 1 2 3 4 5 |
| 3. Ik ben/ik zou het leuk vinden om lid te zijn van de buurtcommissie   | 1 2 3 4 5 |
| 4. Als ik de mogelijkheid had zou ik deze wijk verlaten en verhuizen.   | 1 2 3 4 5 |
| 5. Ik ken mijn burens bij naam  | 1 2 3 4 5 |
| 6. Ik voel me ongemakkelijk wanneer ik in mijn wijk rondloop  | 1 2 3 4 5 |
| 7. In het geval dat er een ontwikkelingsplan voor mijn wijk wordt bedacht wil ik mijn mening over het project kunnen uiten (bijvoorbeeld: plannen voor een herontwerp van mijn straat of voor de herinrichting van een plein) | 1 2 3 4 5 |
| 8. Ik voel me er <u>ongemakkelijk</u> bij om mijn burens te vragen naar een levensmiddel, zoals een kopje suiker of koffie, in het geval dat deze bij mij thuis op zijn.  | 1 2 3 4 5 |
| 9. In het geval dat er midden in de nacht een noodsituatie ontstaat vraag ik mijn burens om hulp  | 1 2 3 4 5 |
| 10. Ik draag als vrijwilliger bij aan buurtprojecten of evenementen.  | 1 2 3 4 5 |
| 11. Wanneer ik kinderen buiten zie spelen let ik net zo goed op hen als dat ik op mijn eigen kinderen zou letten  | 1 2 3 4 5 |
| 12. Ik kan het grote deel van mijn dagelijkse behoeftes vervullen in de wijk (bijvoorbeeld dagelijkse boodschappen, sport, een cursus etc.)   | 1 2 3 4 5 |
| 13. Mijn wijk biedt mij een hoge levenskwaliteit  | 1 2 3 4 5 |

## Part three: demographic data:

Leeftijd: 0-18 / 18-30 / 30-50 / 50-70 / 70+

Geslacht: vrouw / man / anders

Family status: getrouwd / alleenstaand / alleenstaande moeder of vader

In welke wijk?

- [Binnenstad/Burgwallen](#) ([Oude Zijde](#) - [Nieuwe Zijde](#))
- [Grachtengordel](#) (Canal Belt) ([Negen Straatjes](#))
- [Haarlemmerbuurt](#)
- [Jodenbuurt](#)
- [Jordaan](#)
- [Kadijken](#)
- [Lastage](#)
- [Nieuwmarkt](#)
- [Oostelijke Eilanden](#) / [Czaar Peterbuurt](#)
- [Oosterdokseiland](#)
- [Plantage/Weesperbuurt](#)
- [Rapenburg](#)
- [Uilenburg](#)
- [Westelijke Eilanden/Gouden Reael](#)
- [Geuzenveld](#) ([De Eendracht](#))
- [Nieuw Sloten](#)
- [Oostoever](#)
- [Osdorp](#) ([De Aker/Middelveldsche Akerpolder](#))
- [Oud Osdorp](#)
- [Overtoomse Veld](#)
- [Sloten](#) (village)
- [Slotermeer](#)
- [Slotervaart](#)

- [Banne Buiksloot](#)
- [Buiksloot](#)
- [Buikslotermeer](#)
- [Floradorp](#)
- [Kadoelen](#)
- [Landelijk Noord \(Durgerdam - Holysloot - Ransdorp - Schellingwoude - Zunderdorp\)](#)
- [Molenwijk](#)
- [Nieuwendam](#)
- [Nieuwendammerdijk en Buiksloterdijk](#)
- [Oostzanerwerf](#)
- [Overhoeks](#)
- [Tuindorp Nieuwendam](#)
- [Tuindorp Oostzaan](#)
- [IJburg \(Haveneiland - Rieteilanden - Steigereiland - Zeeburgereiland\)](#)
- [Indische Buurt](#)
- [Oostelijk Havengebied \(Eastern docklands\) \(Borneo-eiland - Cruquiseiland - Java-eiland - KNSM-eiland - Oostelijke Handelskade - Sporenburg\)](#)
- [Oostpoort](#)
- [Oud-Oost \(Dapperbuurt - Oosterparkbuurt - Transvaalbuurt - Weesperzijde\)](#)
- [Watergraafsmeer \(Amsteldorp - Betondorp - Omval - Science Park Amsterdam\)](#)
- [De Baarsjes \(Admiralenbuurt/Mercatorbuurt - Chassébuurt - Trompbuurt\)](#)
- [Bos en Lommer \(Kolenkitbuurt - Landlust\)](#)
- [Frederik Hendrikbuurt](#)
- [Houthaven](#)
- [Oud-West \(Kinkerbuurt - Overtoombuurt\)](#)
- [Sloterdijk \(village\)](#)
- [Spaarndammerbuurt](#)
- [Staatsliedenbuurt](#)
- [Waterwijk](#)
- [Westerpark \(non-residential area\)](#)
- [Zeeheldenbuurt](#)

- [Apollobuurt](#)
- [Buitenveldert](#)
- [Hoofddorppeleinbuurt](#)
- [Museumkwartier \(Duivelseiland\)](#)
- [De Pijp \(Oude Pijp - Nieuwe Pijp - Diamantbuurt\)](#)
- [Prinses Irenebuurt](#)
- [Rivierenbuurt](#)
- [Schinkelbuurt](#)
- [Stadionbuurt \(Olympisch Kwartier\)](#)
- [Vondelpark \(park\)](#)
- [Willemspark](#)
- [Zuidas](#)
- [Bijlmer](#)
- [Bullewijk](#)
- [Driemond \(village\)](#)
- [Gaasperdam](#)
- [Venserpolder](#)
- [Sloterdijk \(business district\) \(Teleport\)](#)
- [Westelijk Havengebied \(harbor area\) \(Ruigoord\)](#)

Hoe lang woon je al in deze wijk? Minder dan 1 jaar / 1 - 5 jaar / meer dan 5 jaar

Gemiddeld netto inkomen per maand (dus na belasting): minder dan 1,551/ 1551-4,100 / meer dan 4,000

Onderwijs doorlopen tot: Middelbare school / MBO / HBO / Bachelor / Master /

Gepromoveerd