

# THE INFLUENCE OF THE URBAN ENVIRONMENT ON LONELINESS AMONG ELDERLY



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# The influence of the urban environment on loneliness among elderly

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## PREFACE

Dear reader,

This thesis is part of my graduation for the MSc specialisation Health and Society at Wageningen University.

In September 2017 I started working on this thesis. Even though I was already sure I wanted to do something with the influence of the environment on health, I had a difficulties figuring out what exactly I wanted to research. Luckily my supervisor Carlijn Wentink helped me a lot in this first stage of my research, which made me able to find a topic that matched my interests.

By writing this thesis I have learned a lot about conducting my own research. What I enjoyed most about it was the contact with elderly in the interviews, and seeing the first results of the research on paper.

I would like to thank Carlijn Wentink for giving me advice and guidance during the whole process, for making me more critical about my own work by asking the right questions, and by giving me constructive feedback. I also want to thank Margot Heddes from De Goede Zorg and Pia Wissel from community centre Ons Huis for helping me to find participants for my research. Of course I would also like to thank all participants who were willing to put time and energy in the interviews. Lastly, I want to thank my friends and family for supported me during this phase of my masters.

I hope you enjoy reading this thesis.

Lisanne van Herwijnen



## ABSTRACT

**Background:** loneliness is increasingly recognised as a serious threat for public health. In order to achieve healthy ageing in cities it is important to reduce loneliness among the elderly. A better understanding of how the relationships between the urban environment and loneliness among elderly in the Netherlands work is needed in order to be able to prevent loneliness in this age group with use of the urban environment. **Objective:** to gain more insight in the relationships between factors in the urban environment and loneliness among elderly. **Methods:** semi-structured in-depth interviews with 12 elderly in Apeldoorn and Wageningen have been conducted. In these interviews photo-elicitation was used to retrieve information from respondents about their thoughts and association with certain factors in the urban environment. **Results:** factors in the urban environment can influence loneliness among elderly via several pathways through both behaviour and perception, but also other more personal factors can play a role in the relationship. **Conclusion:** from this research it appears that factors in the urban environment influence loneliness among elderly via different perceptions and behaviours. However, the relations are complex and a more ecological model might be suitable for further investigation on this topic.



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## 1. INTRODUCTION

### 1.1 BACKGROUND

Due to improvements in living conditions and medical technologies, together with a decline in fertility rates, the world's population is ageing (United Nations, 2015). Especially in western countries, such as the Netherlands, the proportion of elderly compared to the younger population is growing rapidly. In 2017 the number of people above the age of 65 in the Netherlands is 3.1 million (18% of the population), and this number is growing (CBS, 2017). Predictions are that in 2040 26% of the Dutch population will be above the age of 65. With a rapidly increasing number of older adults in the Netherlands, the topic of "healthy ageing" is of growing interest. Healthy ageing can be described as *"a lifelong process optimizing opportunities for improving and preserving health and physical, social and mental wellness, independence, quality of life and enhancing successful life-course transitions"* (Peel, Bartlett & McClure, 2004, p. 115).

Since the eighties the number of elderly in the Netherlands living in nursing homes is decreasing, while the overall number of elderly is growing (van Duin, Stoeldraijer, van Roon, & Harmsen, 2016; Garsen & Harmsen, 2011). In 2014, 95% of elderly aged 65 and older was living at home, and of elderly aged 75 and older still 90% was living at home instead of in a nursing home (CBS, 2015). The increase of elderly living at home longer is mainly due to government policy, by reducing possibilities for elderly to reside in a nursing home, and by providing district nursing or opportunities for domestic help (van Duin et al., 2016; Rijksoverheid, n.d.). Elderly themselves also often prefer ageing-in-place, since they are attached to the environment where they have lived for a long time and where they can maintain their social support (Wiles et al., 2011).

However, according to the Consultant of State Property (the "Rijksbouwmeester"), most neighbourhoods are not designed for elderly since most of them are built after WWII to house younger families (Vleugels, 2017). Sidewalks with high curbs make it more difficult for elderly to move around and the nearest shops and public transport opportunities in these neighbourhoods are sometimes too far away. According to the Consultant of State Property, these neighbourhoods also often have a lack of meeting places since they were built purely for housing and not for the social function (Obbink, 2016). When the neighbourhood design is not suitable this can lead to a decline in mobility of elderly and to social problems, such as loneliness (Vleugels, 2017). This is especially important as elderly are already more prone to be lonely due to deteriorating health and a reduced social network (van den Berg, Kemperman, de Kleijn & Borgers, 2016; van Beuningen & de Wit, 2016; Scharf & de Jong Gierveld, 2008). Furthermore, the influence of the urban environment is larger for elderly living independently

compared to elderly in nursing homes, since the former are often more mobile and spend more time outside. There is thus a need for making neighbourhoods more suitable for the elderly.

Loneliness is the subjective experience of an unpleasant and involuntary lack of (quality of) social relationships (van Tilburg & de Jong Gierveld, 2007). It thus depends on the quality of these relationships rather than the quantity of them. Loneliness is different from social isolation since social isolation is about the objective amount of social interactions, and loneliness is about the subjective feeling (de Jong Gierveld, 1987). The feeling of loneliness is influenced by many factors, such as personal characteristics, type of household, health status, and the residential environment. (Volksgezondheidszorg, n.d.; Weijs-Perrée, van den Berg, Arentze, & Kemperman, 2015; Rantakokko et al., 2014). It is most prevalent among elderly, immigrants, and people with a low socioeconomic status (van Beuningen & de Wit, 2016). Loneliness is not only a problem on itself, but it can also cause poorer physical and mental health (Tiwari, 2013). Furthermore, people who are lonely have an increased risk of early mortality (Holt-Lunstad, Smith, Baker, Harris & Stephenson, 2015).

Attention for loneliness as public health problem has grown in recent years, although it is not a new or growing phenomenon (van Beuningen & de Wit, 2016). The municipalities of Amsterdam and Rotterdam, the two biggest cities of the Netherlands, have put reducing loneliness on their policy agenda (Gemeente Amsterdam, 2017; Gemeente Rotterdam, 2014). Dealing with loneliness in cities is necessary as the prevalence there is much higher than in rural areas (Volksgezondheidszorg, n.d.), mainly due to more social cohesion and stronger social ties in small villages (Simon, Vermeij & Steenbekkers, 2007). Policies about loneliness mostly focus on residents in general and not necessarily elderly, however, healthy ageing as mentioned before is on the policy agenda of many municipalities (e.g. Gemeente Utrecht, n.d.; Gemeente Maastricht, n.d.; Gemeente Groningen, 2017). Also, factors that come along with ageing, such as lower health and a reduced social network, cause elderly to have a higher risk of social isolation and loneliness (Scharf & de Jong Gierveld, 2008; van Beuningen & de Wit, 2016; van den Berg et al., 2016). Loneliness is a threat for healthy ageing, since it can reduce the social and mental wellbeing of elderly.

## 1.2 PROBLEM STATEMENT

Loneliness is increasingly recognised as a serious threat for public health, and in order to achieve healthy ageing in cities it is important to reduce loneliness among the elderly. Elderly are more dependent on their residential area as they are often less mobile than younger people (Filius, 1993; Kweon, Sullivan & Wiley, 1998). Due to more health problems elderly have to rely more on facilities and social contacts in their neighbourhood environment, and they are less able to visit other places in order to improve their wellbeing. The study of Melis, Gelormino, Marra, Ferracin and Costa (2015) also

found that the effect of the neighbourhoods built and social environment is dose-related, so it has a larger influence on people who are at home more. Children and adolescents spend a lot of their time at school, and adults often spend most time at work, while elderly are often retired which makes their home environment more important for them. As mentioned before, loneliness is influenced by several factors, of which many are on the individual level and thus cannot be changed easily. The urban environment however offers opportunities to prevent loneliness, since there are more possibilities for adjustments. This will be further explained in the theoretical framework (Chapter 2).

Most studies on the topic of the urban environment and loneliness until now have relied on quantitative data (van den Berg et al., 2016; Maas, Van Dillen, Verheij & Groenewegen, 2009; Scharf & de Jong Gierveld, 2008; Weijs-Perree et al., 2015). Those studies have shown a correlation between several factors in the urban environment and loneliness, however, little is known about how these relations work exactly. For example, green space could influence loneliness because it makes that elderly interact more with neighbours if they are surrounded by green space, or because the presence of green space gives them a certain feeling. Alidoust and Bosman (2015) conducted a small case study to investigate how the urban neighbourhood environment can support the social life of elderly. They found that accessibility, green spaces, and third places had a positive influence on elderly's social life. However, their study they focused specifically on social interactions, while for loneliness there could be other factors that play a role. Also, the study of Alidoust and Bosman (2015) has been conducted in Australia, which has different environmental characteristics than the Netherlands. A better understanding of how the relationships between the urban environment and loneliness among elderly in the Netherlands work is needed in order to be able to prevent loneliness in this age group with use of the urban environment.

### 1.3 AIM AND RESEARCH QUESTION

The aim of the current research is to gain more insight in the relationships between factors in the urban environment and loneliness among elderly. This insight is obtained by acquiring in-depth information about experiences and perceptions of elderly in the Netherlands of their urban neighbourhood environment. In this way it is aimed to generate more knowledge on what could work to prevent loneliness among elderly in the city, through adjusting the physical environment, and why this could work. Therefore the research question that is addressed in this study is:

What are potential mechanisms that explain the relationship between factors in the urban environment and loneliness among elderly?

## 2. THEORETICAL FRAMEWORK

This chapter explains the theoretical framework of this research: the four pathways of environmental health etiology of Commers, Gottlieb and Kok (2006). First, the model will be explained. Then the different factors from the urban environment, perceptions, behaviours, and the health outcome will be explained. Lastly, the model is adjusted towards the topic of urban environment and loneliness among elderly.

### 2.1 FOUR PATHWAYS OF ENVIRONMENTAL HEALTH ETIOLOGY

Commers, Gottlieb and Kok (2006) created a model that describes pathways through which the environment can influence health (Figure 1). This model has been created to enable public health professionals to identify links between the environment and health, so that action can be taken to make environments more health promoting.

The influence of the environment condition (e.c.) on the health outcome (h.o.) can go via four pathways: via behaviour (1), via perception and behaviour (2), via perception (3), and with direct influence (4). An example of pathway (1) is when vegetables are easily available in the environment (e.c.), people will eat more vegetables (behaviour) and become more healthy (h.o). Pathway 2, that goes via perception and behaviour, can be illustrated with smoking. When people perceive that smoking is normal in their environment (e.c.), they will be more likely to start smoking or to continue smoking, which will affect their health (h.o.). Pathway 3, that goes via perception, can occur when people have lower stress levels (h.o.) when they are surrounded by nature (e.c.). Lastly, an example of pathway 4, the direct influence of the environment on health, are health problems (h.o.) caused by air quality (e.c.).

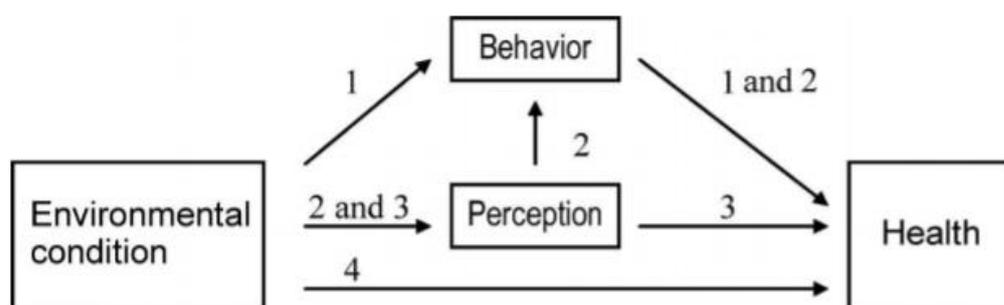


Figure 1. Four pathways of environmental health etiology (Commers et al., 2006).

The model of Commers et al. (2006) can be used in the current study to identify mechanisms that explain the relation between the urban environment and loneliness. Therefore, in this research the environmental condition in the model is the urban environment and the health outcome is loneliness among elderly.

## 2.2 URBAN ENVIRONMENT

Already quite some research has been done on the topic of the urban environment and health or loneliness among elderly. I have done an extensive literature review in order to identify factors in the urban environment that could have an influence on loneliness. In this literature review the following factors were found to possibly have an influence on loneliness: accessibility, green space, walkability, third places, facilities, and urban density (Alidoust & Bosman, 2015; Van den Berg et al., 2016; Kweon et al., 1998; Maas et al., 2015; Forsyth, 2015; Leyden, 2003; Demelle et al., 2013). In the current study the urban environment is defined as the physical environment of the city, however, this physical environment cannot be fully disconnected from the social environment since people are often involved. The factors that have been identified in the literature review will be explained hereafter in alphabetical order.

### *Accessibility*

Accessibility in the current research is physical accessibility, which is defined as the reasonable physical reach of facilities, goods and services for all segments of a population (Evans, Hsua & Boerma, 2013). Alidoust and Bosman (2015) found that accessibility of third places influenced the use of those places, and consequently influenced social interactions of elderly. Third places are public places other than home or work. This concept will be discussed later on since it is also one of the factors that have been identified in the literature study to possibly influence loneliness. Van den Berg et al. (2016) found a link between accessibility and loneliness, since elderly who lived near a highway access felt less lonely than those who did not, but it was not studied how this link worked. It is hypothesised in the current study that elderly living near a highway access have more possibilities to meet friends who live further away, or to join other activities. When elderly stop driving, this can have social implications as it makes it more difficult to visit friends live further away (Oxley & Fildes, 2000).

### *Facilities*

Facilities in this study are the public, commercial, and cultural services in the residential area, for example a supermarket, community centre or shopping centre (Van den Berg et al., 2016). In the study of Van den Berg et al. (2016) it appeared that elderly who are more satisfied with their neighbourhood

facilities feel less lonely, and it is hypothesised in the current study that those people use these facilities more often, which influences their place attachment and therefore loneliness.

### *Green space*

In an urban area, green space is a piece of land covered with grass, trees, shrubs, or other vegetation, such as parks, community gardens, and cemeteries (EPA, n.d.). In their literature review Alidoust and Bosman (2015) found that a substantial number of studies have researched the relation between green space and social relationships. However, in the current study two studies were found that specifically researched the influence of green space on loneliness among elderly. Kweon et al. (1998) found that green spaces fostered elderly's social interactions and in doing so strengthened their neighbourhood ties. The study of Maas et al. (2015) however found that the relationship between green and loneliness had more to do with the sense of community and place attachment than actual social interaction with neighbours.

### *Third places*

Third places are public places other than home or work where people go to socialize, for example a café, coffee shop, store or square (Oldenburg, 1989). This factor overlaps with facilities, as facilities are third places most of the time, but third places do not necessarily have to be facilities (e.g. a square is not a facility). Alidoust and Bosman (2015) found that social interactions of elderly often occur in third places, and thus a lack of third places prevented elderly to meet and interact with other people.

### *Urban density*

The amount of people in the area of residence could have an influence on loneliness, but connections between urban density and loneliness are not straightforward at first glance. Some studies suggest that higher urban density could reduce loneliness (Delmelle, Haslauer & Prinz, 2013), while others did not find a significant relation between the two (Van den Berg et al., 2016). However, when those studies are compared it can be seen that urban density is not used to refer to the same concept. In the study of Van den Berg et al. (2016), urban density refers to building density, while Demelle et al. (2013) refers to urban density as population density, so the amount of people. It is therefore suggested by the current research that population density could have an influence on both meeting people, and residential satisfaction.

## Walkability

According to Forsyth (2015), not one clear definition of walkability exists as it is used for different phenomena. In the current study walkability is referred to as traversable, compact, safe, and physically-enticing areas, so the focus is on environmental features rather than outcomes (Forsyth, 2015). Leyden (2003) found that residents living in walkable neighbourhoods are more likely to know their neighbours and to be involved socially, which indicates the walkability causes them to have more social interactions and a higher sense of community.

The factors in the urban environment that have been discussed can be filled in in the environmental condition box of the four pathways model of Commers (Figure 2).

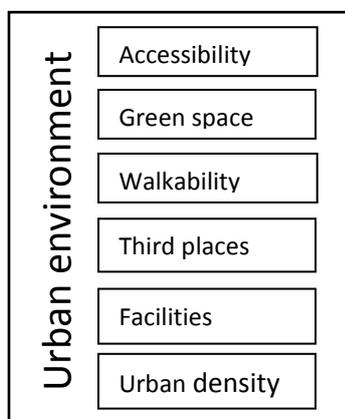


Figure 2. *Factors in the urban environment*

It can be seen that most factors from the urban environment are connected to each other. For example, third places and facilities have some overlap by their definition, accessibility always has to do with the transport to other places such as third places, and walkability and accessibility also have commonalities (i.e. a place is often easier accessible when the walkability is high). This is related to systems thinking in which the complexity and interdependency within and between systems is emphasized (Peters, 2014). Systems thinking is not only related to urban factors in this research, but also to the concepts of health and loneliness since they take place in social and environmental systems and sub-systems with many variables and interactions. It is still useful to study health with use of a simplified model, because it can give insight in how a small part of the system might work (Peters, 2014).

### 2.3 PERCEPTION AND BEHAVIOUR

The second part of the model is about how the environment can influence health. These pathways can go directly, or via perception and/or behaviour.

### *Perception*

Perception is the organization and interpretation of sensory information in order to understand this information (Goldstein, 2009). In this research perception is about perceptions related to the urban environment. In the literature review two types of perceptions in relation to the factors in the urban environment and/or loneliness are found: satisfaction with services and residential satisfaction (Van den Berg et al., 2016; Maas et al., 2015). Satisfaction with services is about how content elderly are with services that are provided in their neighbourhood environment. Residential satisfaction is about how happy elderly are with their place of residence, which could have an influence on loneliness (Van den Berg et al., 2016).

These perceptions can be filled in in the second box of the model.

### *Behaviour*

Behaviour is what a person does in response to a particular situation or stimulus (Cao, 2010). In this research behaviour is about behaviour related to the neighbourhood environment which could have an influence on loneliness. In relation to the previously mentioned urban factors, the following behaviours have been identified: visiting friends, doing activities, and meeting people (Alidoust and Bosman, 2015; Van den Berg, 2016; Kweon et al., 1998). Visiting friends is both about visiting friends that live nearby, as visiting friends that live further away. Doing activities refers to elderly doing organized activities, which can take place in facilities such as a community centre or nursing home, or in the outside environment. Lastly, meeting people is about both casual meetings and planned encounters in the neighbourhood environment.

The behaviours mentioned can be filled in in the third box of the model of Commers, as shown in Figure 3.

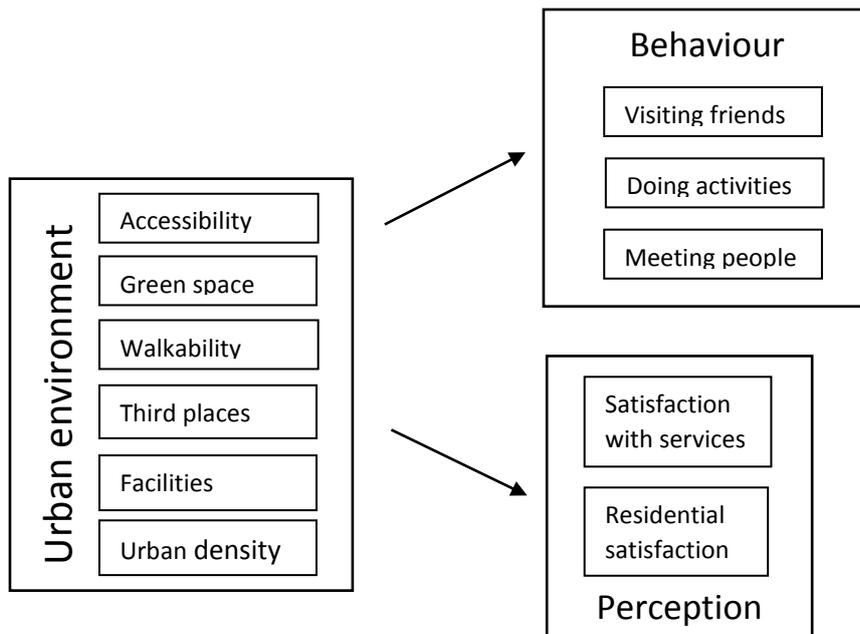


Figure 3. *Perceptions and behaviours of the urban environment*

## 2.4 PREDICTORS OF LONELINESS

From the literature review also several factors that have a direct influence on loneliness were found, which will be called ‘predictors of loneliness’. Predictors of loneliness found in the literature can be divided in factors that can be influenced by the urban environment, and factors that cannot. Social interactions, place attachment, and sense of community are found to have an influence on loneliness (van den Berg et al., 2016; Weijs-Perrée et al., 2015; Prezza, Amici, Roberti, & Tedeschi, 2001) while they can also be influenced by the urban environment. Social interactions are defined as verbal actions and reactions between two or more people, place attachment is *“the affective link that people establish with specific settings, where they tend to remain and where they feel comfortable and safe”* (Hernández, Hidalgo, Salazar-Laplace & Hess, 2007, p. 310), and sense of community is the feeling of belonging and involvement in the community (McMillian, 1976). Personal factors, such as (perceived) health and living alone are found to have an influence on loneliness among elderly (Rantakokko et al., 2014; van den Berg et al., 2016; Weijs-Perrée et al., 2015; Jennifer Yeh & Lo, 2004), however, those factors cannot easily be influenced by the urban environment and are therefore not included in the model.

## 2.5 CONCEPTUAL MODEL

Based on the literature, the model of Commers is adapted towards a conceptual framework for the current study as can be seen in Figure 4.

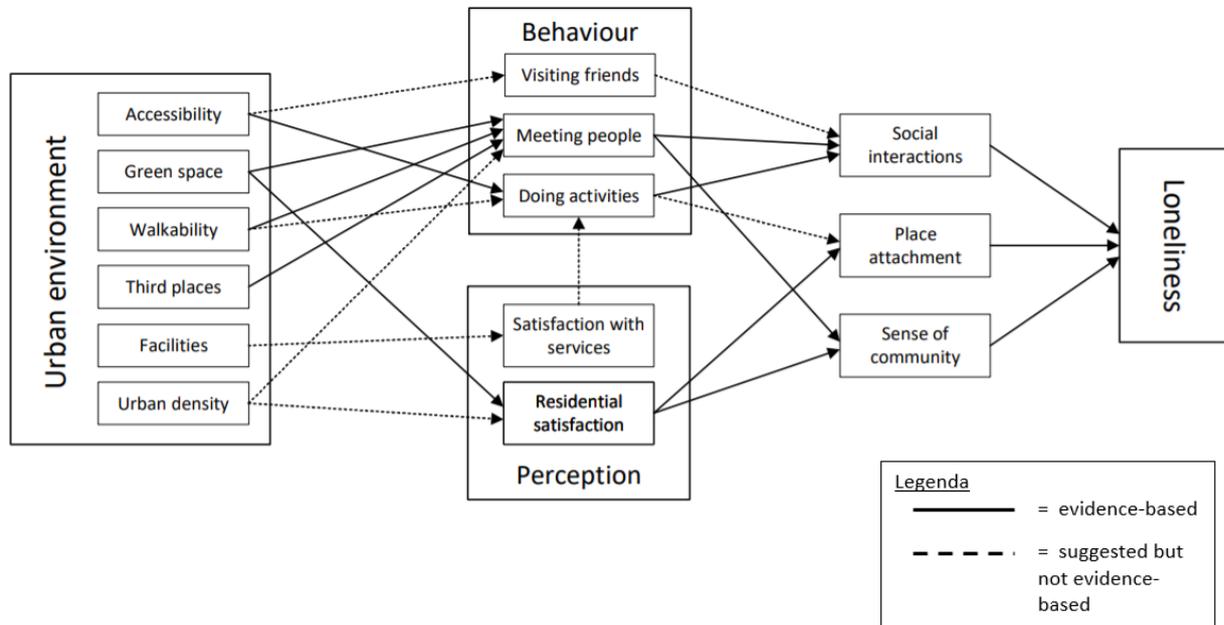


Figure 4. Influence of the urban environment on loneliness among elderly.

The conceptual framework consists of both relations that are evidence-based (continuous lines), and relations that are suggested by previous research are not evidence-based (dotted lines). The arrows in this model mean 'has an influence on', which can be both positive or negative influence. When the conceptual framework is compared to the model of Commers et al. (2006) it can be seen that none of the factors have a direct influence on predictors of loneliness (pathway 4). Factors in the urban environment such as air quality can have an immediate effect on health, but none of the factors identified in the literature is expected to have such immediate effect on loneliness.

The current study will explore relationships between factors in the urban environment and predictors of loneliness. The model is used as an hypothesis, so this research aims to make conclusions about whether or not the model is suitable for explaining the relationship between the urban environment and loneliness, and why.

### 3. RESEARCH QUESTIONS

The main research question of this research is: what are potential mechanisms that explain the relationship between factors in the urban environment and loneliness among elderly?

According to the model of Commers et al. (2006), pathways between the environmental condition and health can go via perception, behaviour, or both. In the conceptual framework it is hypothesised that the factors in the urban environment could influence perception and/or behaviour, and in this way could influence loneliness. Even though the topic of loneliness among elderly and the urban environment is already researched as can be seen in the previous chapter, an explorative research as the current is still useful. This will give a more broader picture of the mechanisms behind it, and see whether or not the relationships can be explained by this model. To investigate the mechanisms with use of the model of Commers et al (2006), the perceptions and behaviours of elderly have to be investigated and linked to both factors in the urban environment and to predictors of loneliness. Therefore the following research questions are identified:

1. What are perceptions of elderly of the urban environment?
2. How do elderly socially and physically behave in their neighbourhood?
3. How are those perceptions and behaviours related to factors in the urban environment?
4. How are those perceptions and behaviours related to predictors of loneliness?

## 4. METHODS

In this chapter the methods that were used in this research will be explained. In order to explore potential mechanisms that explain the relationship between factors in the urban environment and loneliness among elderly, information about elderly's view of the urban environment is needed, as well as how they behave in this environment. This information was obtained by conducting in-depth interviews, together with photo-elicitation. This concept will be explained below in section 4.1. Qualitative research is suitable in this case, since it gives opportunities for exploration of a topic (Boeijs, 2010), and mechanisms that explain the relationship between the urban environment and loneliness have not been extensively examined earlier.

### 4.1 DATA COLLECTION

#### *Interviews*

Semi-structured in-depth interviews were used to collect data since they give room for flexibility and elaboration, and can still give comparable qualitative data. Photos of the neighbourhood environment were shown and respondents were asked to voice their perception about the picture. For example if they like the place, why they like it, if there is a comparable place in their own environment, and what they do there. Respondents were also asked if there were other places in their neighbourhood they often came or which they liked. In addition questions have been asked without photos, for example how well respondents know their neighbours. The interview questions were based on the theoretical framework, so questions were about the perception of elderly of neighbourhood factors (with use of photo-elicitation), about their behaviour in their neighbourhood (e.g. the kind of activities they do there), and about predictors of loneliness (e.g. place attachment). The complete interview guide can be found in Appendix I.

While loneliness is the health outcome of this research, it was not directly asked to respondents whether they felt lonely or not. The main reason for this was that loneliness is a sensitive topic, and asking about it can give respondents an unpleasant feeling which is ethically undesirable. In addition, directly asking about loneliness can cause bias due to socially desirable answers. Loneliness also cannot be measured individually with the use of a loneliness scale. This scale is developed to calculate the average loneliness for thousands of respondents, so using this scale on individuals will not give trustworthy results (de Jong-Gierveld & van Tilburg, 2017). Therefore only questions about predictors of loneliness were asked in the interviews, which are social interaction, place attachment and sense of

community. Since these predictors are found to have an influence on loneliness it is assumed that conclusions can be made about preventing loneliness based on these predictors.

### *Photo-elicitation*

Photo-elicitation was used to retrieve information from respondents about their thoughts and association with certain factors in the urban environment. Photo-elicitation means that photographs are inserted in an interview (Harper, 2002). This can be a useful addition to verbal interviews since answers can become more specific and visual images are suitable for researching perception and association (Vanderveen, 2008). Prior to the interviews photos were taken of places in neighbourhoods where none of the respondents live. It was chosen to show all respondents the same photos of an unfamiliar neighbourhood environment to reduce bias through the quality of the photos and increase comparability of the results. A total of six photos were shown: a photo of a square with shops around, a photo of a courtyard, of a park, a shopping street, a supermarket and a community centre (see Appendix II). These photos were shown to respondents in order to trigger them to think about their own neighbourhood environment and make it easier for them to talk about it.

### *Observation*

Most neighbourhoods in which the respondents live were familiar to the researcher. However, to get an even better understanding of the context when elderly are talking about their own neighbourhood environment, an observation was conducted before or after the interview. In this way the researcher could get a better insight in what facilities there were in the neighbourhood environment of the respondents, where these facilities were located, how green the neighbourhood was, and what the general characteristics of the neighbourhoods were. This observation consisted of exploring the neighbourhood by using Google Maps, and walking through the neighbourhood. Simplified maps derived from Google Maps from the four neighbourhoods can be found in Appendix III. The observations were used to give context to the answers of respondents, so they will not be discussed in the results.

## 4.2 RESPONDENTS AND SAMPLING STRATEGY

The theoretical population in this research are elderly aged 65 or older who live independently in a city. A total of 14 respondents who met the criteria were interviewed, of which 12 interviews could be used in this research. One interview was not included since the respondent could not continue the interview due to health reasons, and one interview was excluded since the respondent had never been outside for the last years. Out of the 12 respondents, 10 reside at two different locations in Apeldoorn,

and two in two different locations in Wageningen. Respondents from Apeldoorn lived in apartments next to a nursing home, but still live independently. Respondents from Wageningen lived on their own, one in an apartment and one in a house. The age of respondents varied between 78 and 93. Nine respondents were female, three were male.

Respondents were found by using different sampling strategies. The personal network was used as the main way to find respondents. A former employer of the researcher, a district manager of a care provider organisation for elderly, was contacted and asked if she could help by acquiring respondents. With her permission, short letters were distributed in two different apartments next to a nursing home in Apeldoorn. Elderly living in these apartments could fill their name and phone number on these letters, and bring them back to the reception of the nursing home. The researcher collected the returned letters and contacted the elderly who wanted to participate. This resulted in 12 respondents. Since this method gave a risk of having a too similar group of people, additionally community centres in Arnhem and Wageningen were approached. From most community centres there came no response. However, one community centre in Wageningen did help to collect respondents, which yielded two extra respondents.

#### 4.3 DATA ANALYSIS

In the analysis it is aimed to find links between behaviours and perceptions, and factors in the environment and predictors of loneliness. Data was analysed concurrently with conducting interviews which gave possibilities to adapt interview questions. Since on first sight themes that appeared from the interviews seemed to be suitable and complete, no interview questions were adapted, included or removed. With permission of respondents, all interviews were recorded and transcribed. After transcribing, the interviews were coded with use of NVivo. First open coding was done by identifying codes for each part of the interview, to discover themes that came up from the interview. Then axial coding was done, which involved combining codes that had a similar meaning, deleting codes that were not useful, and creating main codes and sub-codes. In this phase codes were classified, if possible, to concepts of the theoretical framework. This was done to be able to compare the findings with the theoretical framework. The coding tree can be found in Appendix III.

#### 4.4 ETHICAL CONSIDERATIONS

Since participants in this research are potentially vulnerable elderly, the Social Science Ethical Committee of Wageningen University has been asked for ethical approval. The ethical approval can be found in Appendix IV.

When conducting a research ethical issues always have to be taken into account. In this research basic ethical principles were followed, so confidentiality and anonymity of respondents were guaranteed, and their privacy was protected. Also the principles of non-maleficence and beneficence have been complied as the research does not harm any participant and in all cases puts the wellbeing of participants first (Bowling & Ebrahim, 2005).

Before the interviews participants were told what the interview questions will be about, what their answers will be used for, and that they are free to withdraw at any point of the research, so also after the interviews have been conducted. The research aim (to gain more insight in the relationships between factors in the urban environment and loneliness among elderly) was told after conducting the interview. This was done since it was expected that telling the research aim to participants beforehand could cause bias, since participants would be steered into thinking about loneliness. After the participants were informed about the aim of the research, they were asked if they still agreed that their answers would be used for this research. The request for consent can be found in the interview guideline, in Appendix I.

## 5. RESULTS

This chapter will give an overview of the results from the interviews. First, general perceptions of elderly of the urban environment, and their behaviour in it will be discussed. Then more detail will be given about how the perceptions and behaviours are related to specific factors in the urban environment, and it will be discussed how the perceptions and behaviours are related to predictors of loneliness. Lastly results that do not fit within the theoretical framework will be discussed. Results are sometimes illustrated with quotes from the interviews. The original quotes in Dutch can be found in Appendix V.

### 5.1 PERCEPTIONS OF ELDERLY OF THE URBAN ENVIRONMENT

In general, the interviewees can appreciate places where there is something to see. This can both be people or nature, as long as there is movement, or they can discover something new. Places like a shopping centre or supermarket can be nice, since it is lively and ‘gezellig’ (which in this context means there is a nice atmosphere). Some interviewees also like they sometimes meet other people there, which can be old friends or neighbours.

R#1: *“For me a shopping centre is a meeting place to feel people around you.”*

Nature is mentioned by all interviewees as being nice to be surrounded by. They like to visit a park, but they can also appreciate smaller green spaces, like trees, in an otherwise concrete area.

R#10: *“With those trees in it, and the shops around. That always gives a certain atmosphere. I love trees.”*

Nature makes they can unwind, and it changes with the seasons so there are often new things to see. Interviewees enjoy sitting in the sun, looking at water, trees, birds, and flowers.

In contrast, interviewees dislike places with large buildings, since it gives a less ‘human’ feeling, and places where you feel trapped due to a high urban density. Places where it is very crowded are also disliked by some interviewees, since it gives difficulties walking. However, places where it is very silent are disliked as well, because it can give an unsafe feeling.

#### *Safety*

Without explicitly asking, perceived safety comes up in the interviews as being important for the behaviour in of the neighbourhood environment of the interviewees. Some interviewees mention they

avoid silent places as the forest, silent roads and places at night, since they are afraid that something will happen to them such as being robbed.

*R#6: "Well, the forest.. you hear such horrible things nowadays. Then I think, I do not need that."*

So these places give them an unsafe feeling. The interviewees prefer places where it is slightly more crowded and where they are familiar, since they feel more safe there.

Also physical safety, such as not wanting to fall, is often mentioned as a reason to not go somewhere at a certain time, for example visiting a shopping centre or market at busy hours, or do activities such as cycling.

*R#7: "... and then I did not dare to cycle anymore. So now I have to walk everywhere."*

It is often mentioned that within a shopping centre (parked) bicycles and scooters make it more difficult and dangerous to move around, especially since most elderly interviewed are dependent on a wheeled walker or mobility scooter.

#### *Interim conclusion*

Respondents like places where they can see something happening, both medium crowded areas as more nature areas. Places where they do not feel safe are often avoided.

## 5.2 BEHAVIOUR OF ELDERLY IN THEIR NEIGHBOURHOOD

### *Gaze around*

Some interviewees like to gaze around in for example a shopping centre or supermarket, to look around and see what is sold in the stores, but without a goal. This sometimes causes them to meet other people in the neighbourhood. A few interviewees mention that going outside keeps you attentive. However, this much differs per person, as some interviewees also mention they do not like to maunder about without a goal.

### *Joining organised activities*

More than half of the interviewees joins organised activities in community centres. However, most of them go to the next-door nursing home where they also organise activities, instead of visiting

community centres that are open for everyone in the neighbourhood. This is more convenient for them since the nursing home is much closer than the nearest community centre. Respondents sometimes join organised activities in the nursing home as a replacement of activities they did before, but are now too far away.

R#9: “... and there I did gymnastics. Because from there [previous house] I could walk there, but from here it is too far. And now I’m doing gymnastics here [nearby nursing home].”

Most elderly that live next to a nursing home check the every-week schedule and only join activities if they feel like it. They also sometimes go together with neighbours, or meet neighbours on the way to the activity, since they all have to go the same way. Four interviewees go to a community centre in the neighbourhood, mostly where they have been a member for more than a decennium and where they know the people. Two interviewees say they do not like to join the activities, since they rather are working on their own hobby or they do not like to do games. Having hobbies causes some respondents to feel less need to go outside, since they can entertain themselves.

R#4: “I can be alone very well, I do handicraft and I puzzle.”

#### *Social contacts*

Most interviewed elderly regularly visit friends or family that live nearby, within walking distance from their home. For one interviewee it was the reason to move to where they live now, to

“.. have a place from which we can visit our friends who live here in the neighbourhood.” (R#2)

All interviewees do have some kind of contact with neighbours, but this contact is mainly superficial, so it does not go beyond saying hi or having a small talk in the corridor, or when they meet in for example the supermarket. Interviewees sometimes find it hard to make contact with neighbours in their apartment, because they live quite separated there and do not bump into each other that often. There are also a couple of interviewees who have no need for contact with their neighbours. Only a few interviewees have a bit more extensive contact with their neighbours, in which they visit each other regularly. Most interviewees have lived for a long time in their neighbourhood (not necessarily the current apartment), so they know quite some people there, with who they meet at home or see each other around.

#### *Interim conclusion*

The physical behaviour of elderly in their neighbourhood is often related to their social behaviour. They meet other people when they are gazing around and joining organised activities. Having regular

contact with friends or family often depends on the distance between them. Social contact with neighbours is often liked, but this contact is mainly superficial because of the separated living condition.

### 5.3 PERCEPTIONS AND BEHAVIOURS RELATED TO FACTORS IN THE URBAN ENVIRONMENT

#### *Accessibility*

Accessibility is a theme that comes up in every interview. As mentioned before, elderly often have to deal with physical decline, which makes the distance from their home to their daily needs more important. Interviewees rather walk around their house than going to a park that is somewhat further away, since it is much easier for them.

*R#2: "So I don't have to walk all the way to the park, I can also just go down here."*

Respondents also often choose to join organised activities in a nursing home that is nearby instead of a community centre that is further away. Only two respondents mention they have been member of a community centre for decennia, so they choose to stay there, even if it takes more time and effort to travel there. Many interviewees indicate they like the place where they live since it is close to shops, parks, a forest, a highway access and/or people they know. This makes it easier for them to go somewhere and easier for others to visit them.

#### *Facilities and third places*

In the interview questions were asked about factors in the environment, such a shopping centre, park or supermarket. All interviewees regularly visit a shopping centre, since they have to buy their necessities there. There is a difference among respondents if they like their shopping centre, or a shopping centre in general. About half of the respondents likes visiting a shopping centre: they find it 'gezellig', they meet people there or just feel people around them, find it nice to walk around and see what can be bought, or to drink a cup of coffee.

*R#11: It [shopping centre] is the heart of the neighbourhood.*

The other half of respondents mainly visit a shopping centre because they need to get the groceries, but they do not really enjoy staying there. Three interviewees say diversity in shops keeps a shopping centre more alive, because of the looks and the people it attracts. Some interviewees also mention the shopping centre is a nice place to occasionally go by, but they think it is too crowded for living there

and they would miss their privacy. One respondent on the other hand is thinking about moving to an apartment in the city centre, because of the crowds and liveliness.

Furthermore, eateries, especially places where you can drink coffee, and non-paid sitting possibilities such as benches are appreciated much by the interviewees. Sitting possibilities give them the opportunity to rest before going on with walking. This makes it possible to walk somewhat longer distances.

*R#2: "The first thing I look at is a place where I can rest for a while."*

Besides, eateries or benches can be places where they can meet someone or talk to someone they are already with.

### *Green space*

Parks are liked by most interviewees to walk through. They enjoy being outside and having nature around them. One respondent mentions he sometimes meets other people in the park when he relaxes on a bench, but all other responders enjoy the environment without meeting anyone there.

*R#1: "Then I will walk in the park for an hour. [...] If I feel good, I will do that. And I really enjoy the nature then."*

Also other green spaces, such as forests nearby the neighbourhood or trees within a more built environment are liked a lot. Nature is seen as something alive, which makes it interesting to look at, and green space makes an environment more friendly according to the interviewees. Only one respondent says she does not like parks or forests, because she thinks it is too quiet there and it makes her feel unsafe. She rather goes to more crowded areas.

### *Meeting place*

Several places are mentioned as places where respondents often meet other people from the neighbourhood, such as a shopping centre, a courtyard, corridor of the apartment, or an eatery. A place that is most often mentioned by respondents is the supermarket. They have often change encounters there, since everyone in the neighbourhood needs to go to the supermarket from time to time. That means neighbours regularly go there and changes are high they bump into each other.

*R#11: "And we are not the only ones visiting the supermarket, but also other people come there. So it is a place where you might encounter other people."*

One respondent mentioned she specifically goes to the supermarket to meet other people at the coffee corner there.

### *Urban density*

Urban density comes up in interviews with three respondents. They mention they like places where there is space in between buildings, instead of high rise closely-spaced buildings. Lower buildings with more space in between have a more friendly and accessible appearance to them.

R#11: "... and this seems a bit more, well, human, let me put it like this. It seems a bit more friendly than high-rise buildings."

It appears that 'the more the better' or 'the less the better' does not apply for population density. Most interviewees mention they like lively places where there are other people, since it brings something to see and things are happening around them. They do not like silent places, since they feel unsafe there, they could be robbed for example. But they also do not like crowded places because this makes it difficult for them to move around, especially with a wheeled walker.

### *Interim conclusion*

From the interviews green space comes up more in relation to the perception than in relation to their behaviour. Facilities and third places both can be meeting places. They can also lead to residential satisfaction of respondents when respondents feel they have everything they need in their neighbourhood environment. Accessibility is important for visiting friends: when they live within walking distance it is much easier to visit them. It is also an important factor in deciding where to walk and where to go shopping, and for choosing where to join organised activities.

## 5.4 PERCEPTIONS AND BEHAVIOURS RELATED TO PREDICTORS OF LONELINESS

The predictors of loneliness as identified in the conceptual framework are social interactions, sense of community and place attachment.

### *Social interactions*

As said before, for social interactions with friends and family the distance is important for interviewees, since they visit friends and family more often when they live within walking distance. Contact with neighbours can be difficult, especially in an apartment, because they live quite separated there and do not see each other that often. Most interviewees have lived for a long time in their neighbourhood and they know quite some people there, which they sometimes bump into when going to a shopping centre or supermarket.

### *Sense of community*

Most interviewees have a high sense of community since they have lived for a long time in the same neighbourhood and they know many people there. Going to activities in the nearby nursing home, or in a community centre can give a feeling of belonging. Interviewees sometimes go together with neighbours, or meet people there who are in the same kind of situation as them. This could create a sense of community. However, some interviewees mention they do not go to a community centre since they do not know what is organised there, or they think it is only for younger people. These expectations might give the feeling of not belonging somewhere.

Some interviewees mention they regret that they cannot do certain things anymore, like their hobbies, cycling around or joining organised activities.

*R#2: "And then they had a meeting upstairs. And they don't have an elevator. So that is a shame, I would have gone there with pleasure. Well, getting older comes with handicaps and you have to accept them. But this one I found very annoying."*

One interviewee mentions she regrets she moved to where she lives now, as in the previous apartment there was more supervision and more social contacts. This kind of regret can influence the sense of community, since it can create a feeling of not belonging anymore.

Some interviewees seem to have had a higher sense of community when they lived in a low-rise house compared to the apartment they live in now. They feel more separated in their apartment since they cannot see people walking in front of their home. However, some also felt alone in their old neighbourhood when everyone around them moved or passed away, and there came new people who were much younger and had their own lives.

### *Place attachment*

When asking about place attachment, most interviewees say they are attached to the place where they live now, since they have lived in that neighbourhood for a longer time. They are accustomed to it and familiar with it, and some even mention the neighbourhood is part of their life. When they go to the supermarket or walk around, they often meet people they know from there. They also like that shop employees or owners know who they are, so they can help them if necessary. Some interviewees also appreciate they live in a relatively green environment and to have shops nearby where they can get their daily necessities. In this sense it matches the conceptual framework which shows that residential satisfaction influences the place attachment.

## 5.5 OTHER RESULTS

Not every theme that came up in the interviews fits into one of the boxes identified in the theoretical framework. However, these themes are important in exploring the relationship between the urban environment and loneliness among elderly, so they will be discussed in this section.

### *Attitude towards own situation*

When getting older certain things can be reduced, such as the amount of loved ones around you, or your own health. In almost every interview a decline of health was mentioned, which in turn caused a reduction of places where to go. However, about half of the interviewees mention they enjoy what they can do, and that they are happy they still have what they have, like their mental health and social contacts.

R#8: *"I am still clear-headed. And I have nice contacts with the nursing staff, with everyone."*

This attitude can have an influence on the perception of the interviewees, because they have a positive way of viewing places where they still can go. It also influences their behaviour since they still do the things they can do, such as activities in the nearby nursing home, or walking to the nearby shopping centre.

### *Mobility*

For most interviewees walking is their main mode of transportation, sometimes with help of their wheeled walker, or use of a mobility scooter. Only one interviewee uses the bike for cycling around, and two still drive a car, which gives them possibilities to travel a bit further and to explore new places or to visit friends or family. Interviewees also walk for recreation, to enjoy the environment, especially nature, to see something around them, and to keep active.

### *Physical health*

It is important for most interviewees that there are possibilities for walking nearby, such as a park, and that the roads are well-maintained and there are enough sitting possibilities. As mentioned before, physical health also plays a role in respondents' decision to go somewhere, because they have to make sure they won't fall. Seven interviewees mention they have physical limitations which makes them less able to travel long distances or even go outside at all.

R#5: *"I am already happy if I can get to the shopping centre with help of my wheeled walker. Then I can sit there, drink a cup of coffee, and go back."*

Children of the respondents sometimes help when they want to join an activity like going to the theatre, or a Christmas dinner, and one interviewee says her daughter pushes her wheelchair when they go shopping, or go to the park. Because of their physical limitations interviewees also appreciate help from shop employees or owners while shopping.

*Interim conclusion*

Attitude, mobility, and physical health have an influence on the behaviour of respondents, and physical health is also important for the perception of safety. These factors are thus important in exploring the relations between the environment and loneliness, and therefore indicate that the relation between factors in the urban environment and loneliness among elderly might not be as linear as suggested in the theoretical framework.

## 6. DISCUSSION

The main research question of this research was:

*What are potential mechanisms that explain the relationship between factors in the urban environment and loneliness among elderly?*

In order to give an answer to this question, the Four Pathways of Health Etiology model of Commers et al. (2006) has been used. In this chapter the most important findings from the results will be discussed, and they will be compared to the conceptual framework. After that, the framework will be adjusted according to the results found in this research. Lastly, limitations and recommendations will be discussed.

### 6.1 COMPARISON OF RESULTS AND CONCEPTUAL FRAMEWORK

Many themes in that came out the interviews correspond to the conceptual framework, but also differences can be found.

#### *Similarities between results and conceptual framework*

Part of the factors in the urban environment that came up in the interviews can be attributed to the fact that specific photos from these factors were shown to respondents. These factors were the facilities supermarket, shopping centre and community centre, the third places square and courtyard, and green space. However, it is expected that the factors supermarket, shopping centre, community centre and green space would have come up in the interviews anyways, since almost all respondents gave extensive answers on those topics, and often referred back to it later in the interview. This is in line with the study of Alidoust and Bosman (2015), who found that social interactions of elderly happened mostly in third places. However, in this study it has not been specified in what type of third places most of the interactions happened. The factors square and courtyard were less extensively discussed, so they seem to be less important for respondents. This could be due to the fact that a square for respondents was very much related to a shopping centre, so they elaborated more on that. It was expected that a courtyard could be a meeting place for elderly, but since none of the respondent lived in a senior housing this factor was less relevant.

Other factors in the urban environment that came up from the interviews which were not explicitly asked for were eateries and sitting possibilities. Eateries and sitting possibilities seem to influence how the environment is liked. It also influences the walkability since most interviewees had some kind of physical decline, which made places to sit down necessary when walking longer distances. Furthermore, population density was important in how respondents liked a place, since most

respondents like lively places and places where there is something to see. Another factor that matches with the conceptual model is accessibility. Accessibility played an important role for respondents in deciding to go or to not go somewhere, for example a community centre or visiting friends or family. This corresponds to the studies of Van den Berg et al. (2016), and Alidoust and Bosman (2015), who found that accessibility of third places influenced the use of those places, and therefore influenced social interactions of elderly.

Behaviours that could influence the predictors of loneliness are also corresponding to the conceptual framework. These are visiting friends and family, meeting people, and joining organised activities. All of these behaviours have an influence on the social interactions. Furthermore, visiting friends and family could have an influence on place attachment, and meeting people and joining organised activities on sense of community.

#### *Differences between results and conceptual framework*

Also some topics that do not correspond to the conceptual framework came up. Firstly, from the interviews it seems that the behaviours mentioned in the conceptual framework are not only influenced by the factors in the urban environment, but also by if they are gazing around or not, and by the mobility of the elderly. The importance of mobility is also reflected in the study of Van den Berg et al. (2016), who found that the use of different transport modes reduces loneliness. Physical health also seems to be an important factor influencing behaviour, just like a positive attitude towards one's own situation. A negative attitude can put emphasis on what they cannot do anymore and can give a feeling of not belonging anymore, and thus influence the sense of community. Lund (2003) also found that social ties in the neighbourhood were significant related to the attitude towards walking. The factor of physical health and attitude towards one's own situation do not really fit within any of the boxes, since they are more personal characteristics. However, it is important to also take these factors into account since they have an influence on the mechanisms behind factors in the urban environment and loneliness among elderly.

Safety turned out to be very important for the behaviour of respondents, in particular in making the decision to not go somewhere at a certain time. The type of safety that came back in the interviews was perceived safety, as opposed to actual crime rates. This is in line with the results from the study of Piro, Næss and Claussen, (2006), who found that perceived safety for women was strongly associated with their physical activity. This safety is thus a perception and therefore fits within the box of 'perception' in the theoretical framework. Perceived safety of elderly can be influenced by the population density and by their own (perceived) physical health.

Satisfaction with facilities does not really influence if the facilities are used or not, as hypothesized in the conceptual framework. For example, respondents mostly went to the nearest supermarket regardless of how much this specific supermarket was liked, so for this accessibility is more important. Also for community centres the distance is more important for respondents in deciding whether to go there or not than how much the community centre is liked. Satisfaction with services can however influence the residential satisfaction, when respondents feel they have the right shops for them, there are eateries, sitting possibilities, and they can do activities in the community centre which they like.

In the conceptual framework can be seen that green space both influences behaviour, since it can function as a meeting place, and perception since it gives more residential satisfaction. However, from the interviews it seems that green space is much more linked to residential satisfaction than to meeting people. Almost all respondents liked parks and urban areas with green space in it, since it makes the environment more calm and it gives them something to see as nature is alive and it changes with the seasons. Respondents (except for one) did not mention they often met other people there, so it was purely the environment they liked. This does not match with the study from Kweon et al. (1998), who found that green space did influence the social interactions with neighbours. An explanation for this can be the country in which this study was conducted, namely the United States. In the study of Maas et al. (2015), conducted in the Netherlands, it also has been found that green space has more to do with perception than actual social interactions with neighbours.

Residential satisfaction seems to have an influence on place attachment, since respondents were very positive about the green aspects of their neighbourhood. This relationship however can also go the other way around, since respondents that are attached to their neighbourhood, for example because they have lived there all their life, are more satisfied with living there. From the interviews it cannot be said whether or not residential satisfaction is related to sense of community, which it does in the model. The sense of community seems to be mostly determined by how long someone lives in their neighbourhood and if they feel they belong there. Place attachment also seems to be partly determined by the length of residence in the neighbourhood, because it caused respondents to be more accustomed to their neighbourhood. This can be related to visiting friends and meeting people, since they know more people in the neighbourhood.

## 6.2 ADJUSTED MODEL

The conceptual model as discussed in Chapter 2 can be adjusted according to the results found in this research.

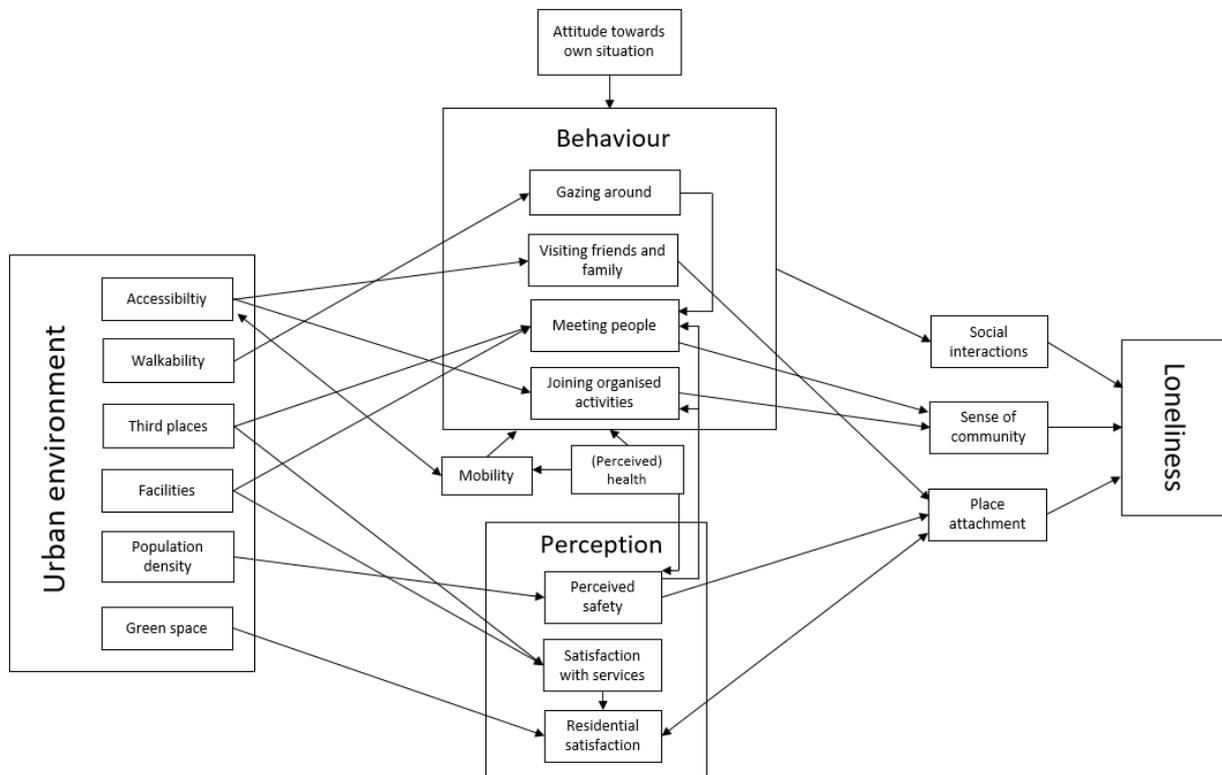


Figure 5. *Adjusted Four Pathway model based on results.*

This model shows that the relations are very complex, especially when it is taken in mind that also the factors in the urban environment are interrelated. This fits within the theory of system thinking, which was shortly mentioned in the theoretical framework (Chapter 2). To reduce loneliness among elderly with use of the urban environment it is thus not sufficient to only look at the effect of the separate factors, but the broader system has to be taken into account. For example a more ecological model might be suitable for further investigation on this topic, because of this can take the interdependencies between different factors into account.

## 6.3 LIMITATIONS

A model is a representation of reality, which is useful for interpreting and researching the reality, but it is not the reality itself. The model of Commers et al. (2006) that is used for this research is very linear: one factor influences the next one. However, as can be seen in the results from the interviews, it

appears that these relations are not that straightforward. Some themes that came up from the interviews did not fit within any of the boxes of the theoretical framework, while they were important for exploring the relationships between the urban environment and loneliness among elderly. Perceptions from the urban environment and behaviours in this environment are not only influenced by factors in the urban environment, but also more personal factors such as attitude towards one's own situation or physical health play a role. Furthermore, the residential satisfaction could influence the place attachment of elderly, but this relationship can also go the other way around. The reality is thus not as clear-cut as presented in the theoretical framework. This can already be seen in the adjusted framework, in which the complexity is more reflected.

Another limitation of this research is the lack of variation in respondents. All respondents lived in Apeldoorn or Wageningen, so it is unclear whether or not results would be the same in other Dutch cities. However, it is expected that results would not differ that much in other cities, since Apeldoorn and Wageningen are located in the middle of the Netherlands and are rather average in size. Also almost all respondents lived in the same housing type, namely an apartment. Results could be different if more respondents would have lived in low-rise buildings, or in senior housings. Lastly, the theoretical population were elderly above the age of 65, and respondents between the age of 78 and 93, which is less diverse than the theoretical population. Since nowadays people between the age of 65 and 75 are mostly still quite active, it is unclear whether or not results from this research can be generalised to the whole theoretical population.

Finally, as with any type of research, especially qualitative research, the researcher could have caused some bias. Respondents could have been influenced by the way of asking interview questions or by the photos that the researcher showed. It is not expected that this has caused respondents to give false information. However, other ways of asking, or showing different kind of pictures, could have stimulated respondents to give more or less information about certain topics. It has been tried to reduce this bias as much as possible by using an interview guide, and by asking respondents if there were other places in the neighbourhood where they liked to come.

## 6.4 RECOMMENDATIONS

### *For municipalities*

First of all, it would be useful for municipalities to take a more system thinking approach when wanting to target loneliness among elderly in the city with use of the environment. In this they should take into account the connections between factors in the urban environment, such as accessibility and third

places, or walkability and accessibility. Also a more social intervention that targets the attitude towards one's own situation can have an effect, not only because it might in itself already make elderly feel happier, but also because it can make that elderly will make more use of the urban environment, which could influence loneliness. When the broader system is taken into account it might be easier to see what the most important factors are to focus on for reducing loneliness among elderly.

However, based on the model also some more specific recommendations can be made in order to prevent and reduce loneliness among elderly in the city with use of the urban environment. First of all, there should be enough green space in the neighbourhood. This green space does not have to be a large park, but are rather multiple smaller areas of green space since this already seems to improve the residential satisfaction of elderly. It is also important that facilities such as a supermarket and shops are nearby, and that there are opportunities for joining organised activities in the neighbourhood. Shopping centres can be made lively through variation in shops, which makes it more appealing for elderly, and makes them feel safe. In order to stimulate spontaneous encounters it is recommended to have meeting places within apartment buildings, for example a kind of small living room with a table and chairs, where you can drink a coffee. Lastly, it is recommended to have enough sitting possibilities within the urban environment, so elderly have the chance to walk longer distances and broaden their world.

#### *For further research*

In the current research it could be seen that a linear model is not most suitable for studying this topic. Therefore it would be useful for further research on the topic of the urban environment and loneliness among elderly to use more ecological model to see how environment influences loneliness.

Furthermore it would be interesting to study this topic including younger elderly between the age of 65 and 75. In this way it can be seen how the urban environment influences loneliness for them, and it can be seen what the difference is with older the older elderly participating in this research. It would also be interesting to see if the same results will be obtained when conducting a research on this topic in a different part of the Netherlands.

## 7. CONCLUSION

This research gave insight in how the relations between factors in the urban environment and loneliness among elderly might work. The Four Pathways of Environmental Etiology model of Commers et al. (2006) gave understanding in in how these relations could work through the perception of elderly of the urban environment, and/or through their use of the neighbourhood environment. The results showed that the urban environment can influence loneliness among elderly via several of these pathways. However, the results from this research did not all fit within the Four Pathway model. This indicates that the relations between the urban environment and loneliness are not as linear as hypothesised in the conceptual framework. Therefore a more ecological model might be suitable for further investigation on this topic, because of the many interdependencies that exist in the relationship between the urban environment and loneliness among elderly.

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Heel erg bedankt dat u mee wilt werken aan dit onderzoek. Ik zal mezelf eerst even kort voorstellen. Ik ben Lianne, en ik studeer aan de Universiteit van Wageningen. Ik doe dit onderzoek als afstudeeropdracht voor mijn masteropleiding Gezondheid en Maatschappij. Zoals u misschien al weet gaat dit onderzoek over ouderen en wat zij doen in de buurt op sociaal en fysiek gebied, en hoe ze de buurt ervaren. Ik zal eerst een aantal foto's van plekken in andere buurten laten zien en hier wat vragen bij stellen, en dit kunnen we vergelijken met de eigen buurt. Daarna zal ik nog wat vragen stellen over uw eigen ervaringen. Alle informatie die u hier verteld is vertrouwelijk, dus ik zal ervoor zorgen dat uw naam nergens vermeld wordt en dat wat u nu vertelt niet aan u te linken is. Het interview zal ongeveer een half uur tot een uur duren, maar dat is ook grotendeels afhankelijk van de antwoorden. U bent vrij om op elk moment uit het interview te stappen, mocht u dat willen. Ook mag u naderhand laten weten als u liever niet heeft dat uw antwoorden gebruikt worden in het onderzoek. Vind u het goed dat het interview wordt opgenomen? Dat is voor mij handig bij het uitwerken.

Opname aan: Vanuit onderzoek richtlijnen moet ik vragen of u akkoord gaat met het gebruik van uw antwoorden voor dit onderzoek. Gaat u akkoord? Heeft u nog vragen voor we met het interview beginnen?

1. Kunt u misschien kort wat over uzelf vertellen? (Hoe oud bent u? Waar komt u vandaan? Waar woont u nu (straatnaam)? Hoe lang woont u hier?)

Ik zal nu wat foto's laten zien van plekken in andere buurten zodat u daar uw mening over kunt geven.

2. [foto van plein]
  - a. Wat vindt u van deze plek?
    - i. En waarom?
  - b. Hoe zou u u voelen als u op deze plek zou zijn/als u hier zou lopen?
  - c. Heeft u ook zo'n plek in uw buurt?
  - d. Komt u daar graag?
  - e. Wat doet u daar meestal?
3. [foto van hofje]
  - a. Wat vindt u van deze plek?
    - i. En waarom?
  - b. Hoe zou u u voelen als u op deze plek zou zijn/als u hier zou lopen?
  - c. Heeft u ook zo'n plek in uw buurt?
  - d. Komt u daar graag?
  - e. Wat doet u daar meestal?
4. [foto van park]
  - a. ...
  - b. ..
  - c. ..

- d. ..
- e. ..
- 5. [foto van winkels]  
A, b, c, d, e
- 6. [foto van supermarkt]  
A, b, c, d, e
- 7. [foto van buurtcentrum]  
A, b, c, d, e
- 8. Zijn er nog andere plekken in de buurt waar u graag komt?
  - a. Welke?
  - b. Waarom komt u daar graag?
  - c. Wat doet u daar meestal?
- 9. Wat voor activiteiten doet u verder in uw buurt?
- 10. Kent u ook mensen in de buurt?
  - a. Hoeveel ongeveer?
  - b. Hoe vaak ziet u deze mensen?
- 11. Waar ziet u deze mensen meestal?
  - a. Spreekt u dan af of is het een toevallige ontmoeting?
  - b. En waarom daar?
- 12. Bent u gehecht aan uw buurt?
  - a. En waarom?
  - b. U zou dus wel/geen moeite hebben om te verhuizen?
- 13. Welke aspecten of dingen in de buurt maken het voor u makkelijker om naar buiten te gaan?
  - a. En welke aspecten maken het moeilijker? / is de route naar winkels e.d. goed te doen?
- 14. Wilt u verder nog wat toevoegen? Heeft u nog vragen of opmerkingen?

Bedankt voor uw tijd en antwoorden.

Waar denkt u dat het onderzoek over gaat? Deze informatie wil ik uiteindelijk gebruiken om wat te kunnen zeggen over de invloed van de omgeving op eenzaamheid bij ouderen. De resultaten van dit onderzoek zullen dus vooral gaan over eenzaamheid. De factoren in de buurt waar ik u vragen over heb gesteld hebben volgens de literatuur te maken met eenzaamheid en ik hoop met dit onderzoek inzicht te geven in hoe eenzaamheid voorkomen zou kunnen worden. Als u niet wilt dat uw antwoorden hiervoor gebruikt worden mag u het zeggen, dan zal ik deze niet gebruiken.

APPENDIX II PHOTOGRAPHS USED FOR PHOTO-ELICITATION



1. Square



2. Courtyard



3. Park



4. Shopping street

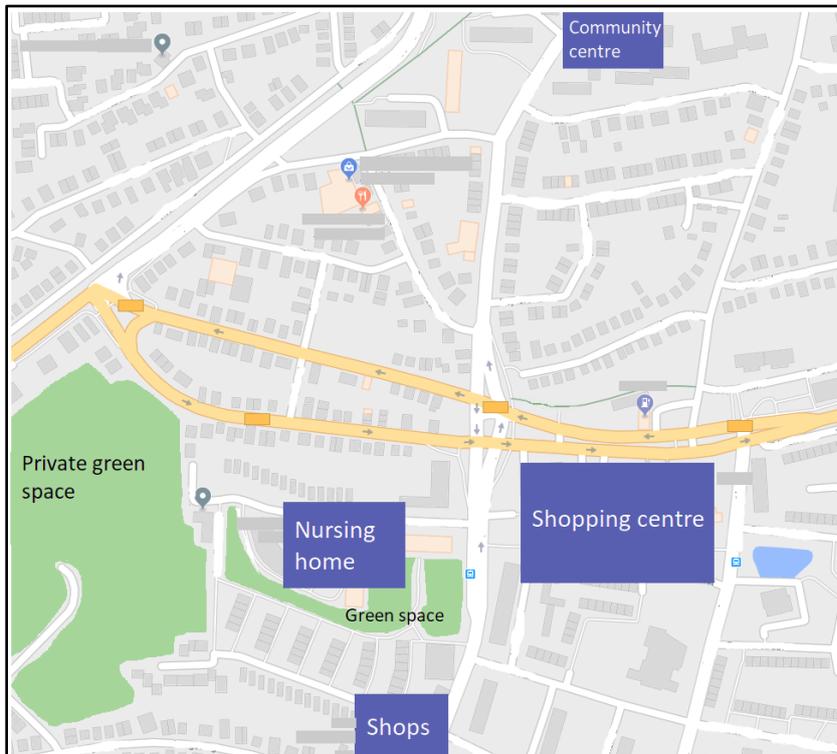


5. Supermarket

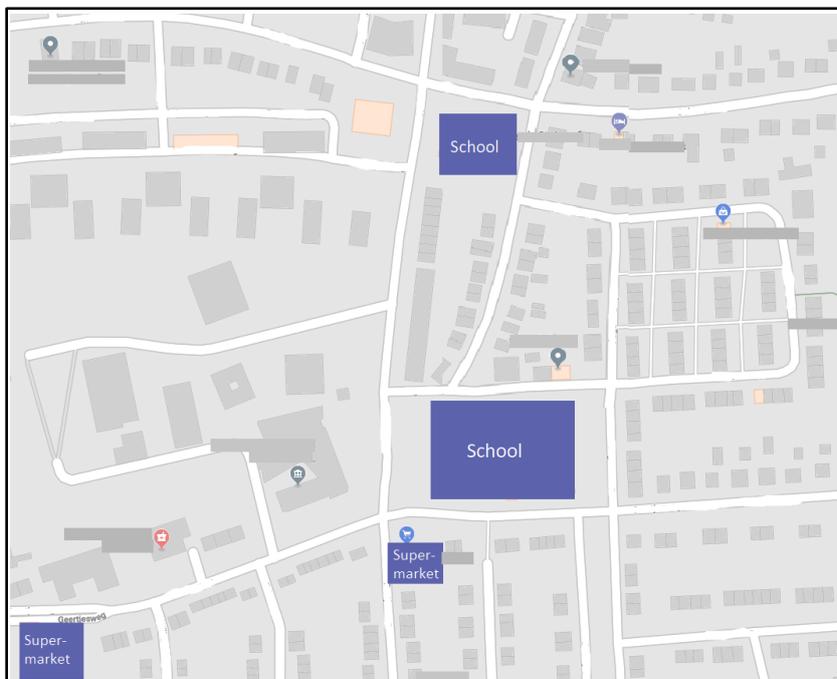


6. Community centre

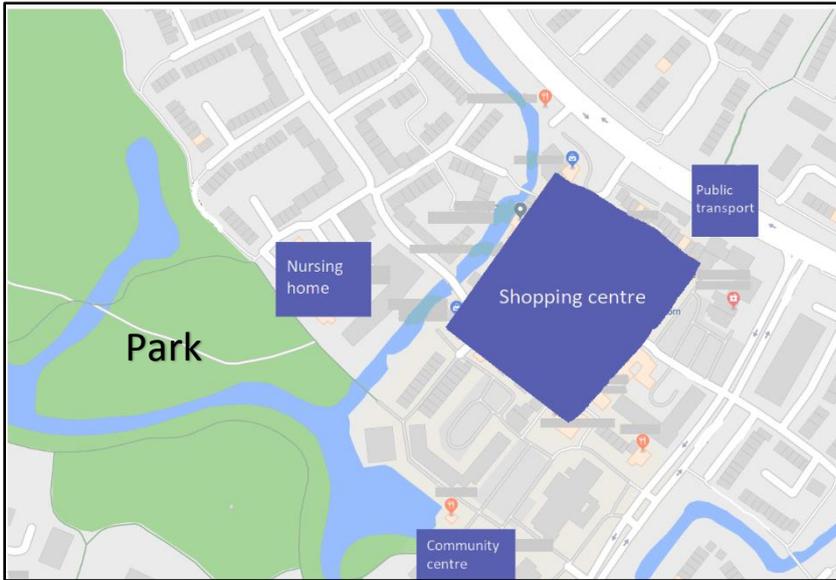
APPENDIX III MAPS OF NEIGHBOURHOODS RESPONDENTS



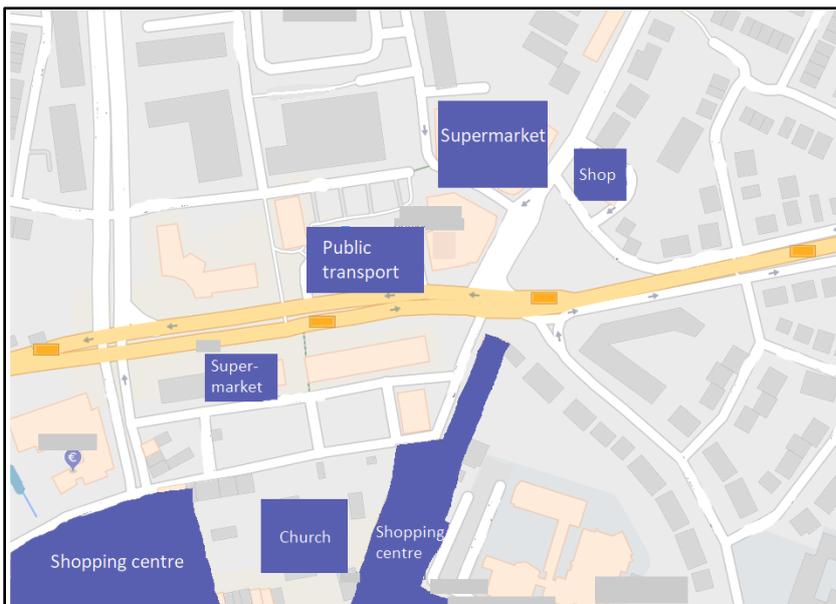
Neighbourhood 1



Neighbourhood 2

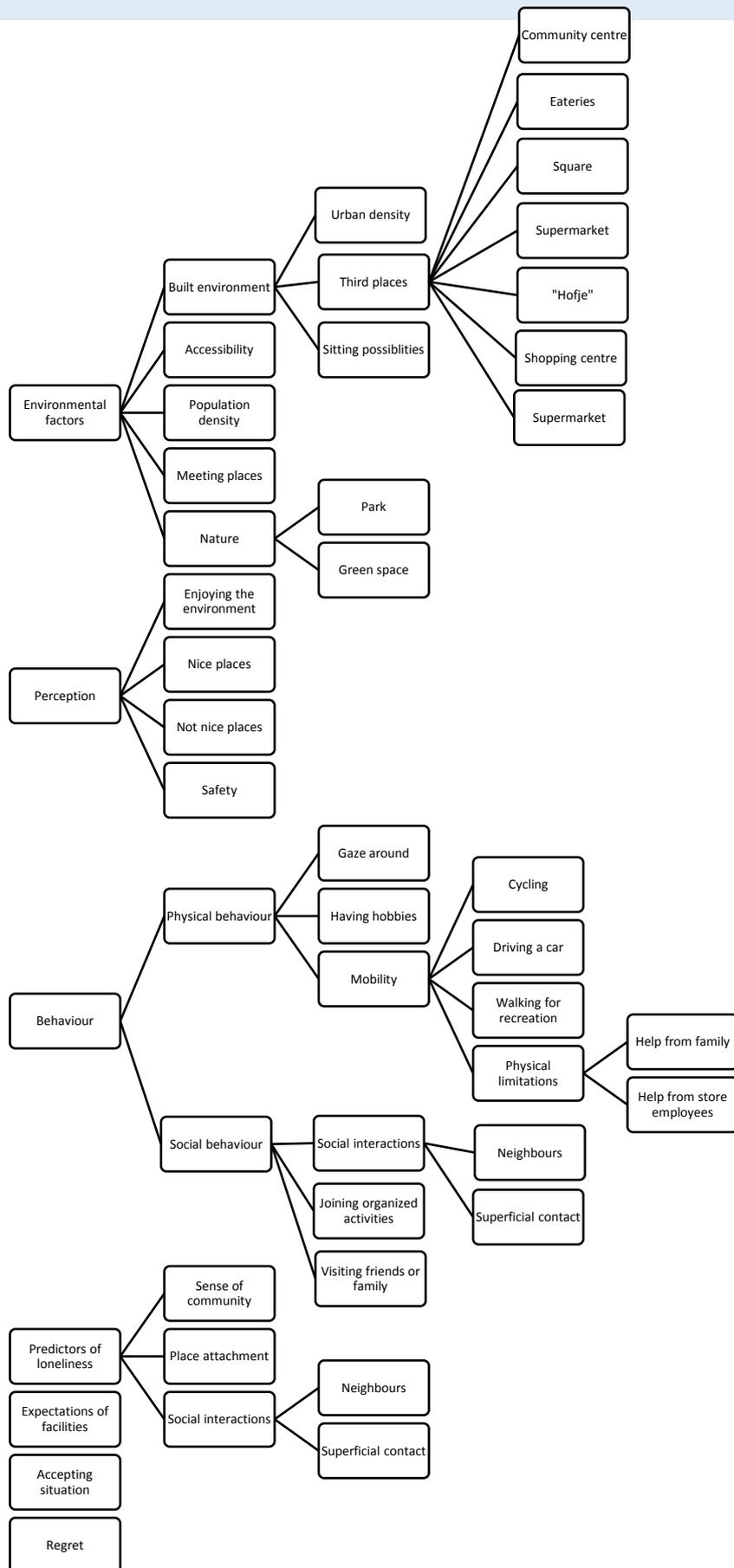


*Neighbourhood 3*



*Neighbourhood 4*

APPENDIX IV CODE TREE





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To whom it may concern

The following project proposal has been reviewed by the Social Sciences Ethics Committee (SEC):

Title: Influence of the Physical Environment on Loneliness Among Elderly in the City  
Project team: Lisanne van Herwijnen  
Funding: -  
Period: November 2017 – February 2018  
Location: -

The Committee has concluded that the proposal deals with ethical issues in a satisfactory way and that it complies with the Netherlands Code of Conduct for Scientific Practice.

With kind regards,

Professor Dr Marcel Verweij  
Chair Social Sciences Ethics Committee

DATE  
4 December 2017

SUBJECT  
Ethical approval of research project

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## APPENDIX VI INTERVIEW QUOTES

Respondent number	Quote in Dutch	Translation in English
1	Een winkelcentrum is volgens mij ook een ontmoetingsplek om mensen om je heen te voelen.	<i>I think a shopping center is a meeting place to feel people around you</i>
10	Met die bomen erin, en rondom met de winkels. Ja dat geeft altijd een bepaalde sfeer. Ik ben gek op de bomen.	<i>With those trees in it, and the shops around. That always gives a certain atmosphere. I love trees.</i>
5	Ik ben al blij dat ik achter de rollator tot het [winkelcentrum] kom, kan ik daar even zitten, kopje dingetjes en dan weer terug.	<i>I am already happy if I can get to the shopping centre with help of the wheeled walker. Then I can sit there, drink a cup of coffee, and go back.</i>
9	"... en daar was ik op gymnastiek. Want dan kon ik vandaar nog wel lopen, maar vanaf hier is het me te ver. En nou ben ik hier op gymnastiek.	<i>... and there I did gymnastics. Because from there [previous house] I could walk there, but from here it is too far. And now I'm doing gymnastics here [nearby nursing home].</i>
4	En ik kan heel goed alleen wezen, ik handwerk en ik puzzel.	<i>I can be alone very well, I do handicraft and I puzzle.</i>
2	..., om een plekje te hebben van waaruit we onze vrienden die hier in de buurt wonen kunnen bezoeken.	<i>... to have a place from which we can visit our friends who live here in the neighbourhood.</i>
11	Het is een beetje het middelpunt voor zo'n wijk.	<i>It [shopping centre] is the heart of the neighbourhood.</i>
2	Het eerste waar ik naar kijk is een plek waar ik even kan uitrusten.	<i>The first thing I look at is a place where I can rest for a while.</i>
1	Dan ga ik er lekker een uurtje wandelen in het park ... En als ik me goed voel, dan doe ik dat. En dan geniet ik ook ontzettend van de natuur.	<i>Then I will walk in the park for an hour. [...] If I feel good, I will do that. And I really enjoy the nature than.</i>
11	En gaat niet alleen bij ons zo [naar supermarkt gaan], maar ook bij andere mensen. Dus het is nog wel eens een plek waar je ook nog andere mensen treft.	<i>And we are not the only ones visiting the supermarket, but also other people come there. So it is a place where you might encounter other people.</i>
11	...en dit komt wat meer, ja, menselijk, laat ik het zo zeggen. Het komt wat vriendelijker over vind ik altijd dan hoogbouw.	<i>... and this seems a bit more, well, human, let me put it like this. It seems a bit more friendly than high-rise buildings.</i>
6	Nou, in het bos, je hoort tegenwoordig zulke akelige dingen. Dat ik denk van, dat hoeft niet voor mij.	<i>Well, the forest.. you hear such horrible things nowadays. Then I think, I do not need that.</i>
2	Dus ik hoef niet helemaal naar het park te lopen, ik kan ook naar beneden zakken.	<i>So I don't have to walk all the way to the park, I can also just go down here.</i>
7	En toen durfde ik niet meer te fietsen. Dus ik moet nu alles lopen.	<i>... and then I did not dare to cycle anymore. So now I have to walk everywhere.</i>
2	En toen hadden ze de vergadering boven. En ze hebben geen lift. Dus het is jammer, ik was er echt met plezier naartoe gegaan.	<i>And then they had a meeting upstairs. And they don't have an elevator. So that is a shame, I would have gone there with</i>

	Maar ja, het ouder worden komt met handicaps en dat moet je accepteren. Maar deze vond ik wel heel vervelend, kan wel zeggen dat ik erg boos was.	<i>pleasure. Well, getting older comes with handicaps and you have to accept them. But this one I found very annoying.</i>
8	Ik heb ze nog goed op een rijtje. En ik heb wel wat leuke contacten met de zorg en zo, met iedereen.	<i>I am still clear-headed. And I have nice contacts with the nursing staff, with everyone.</i>