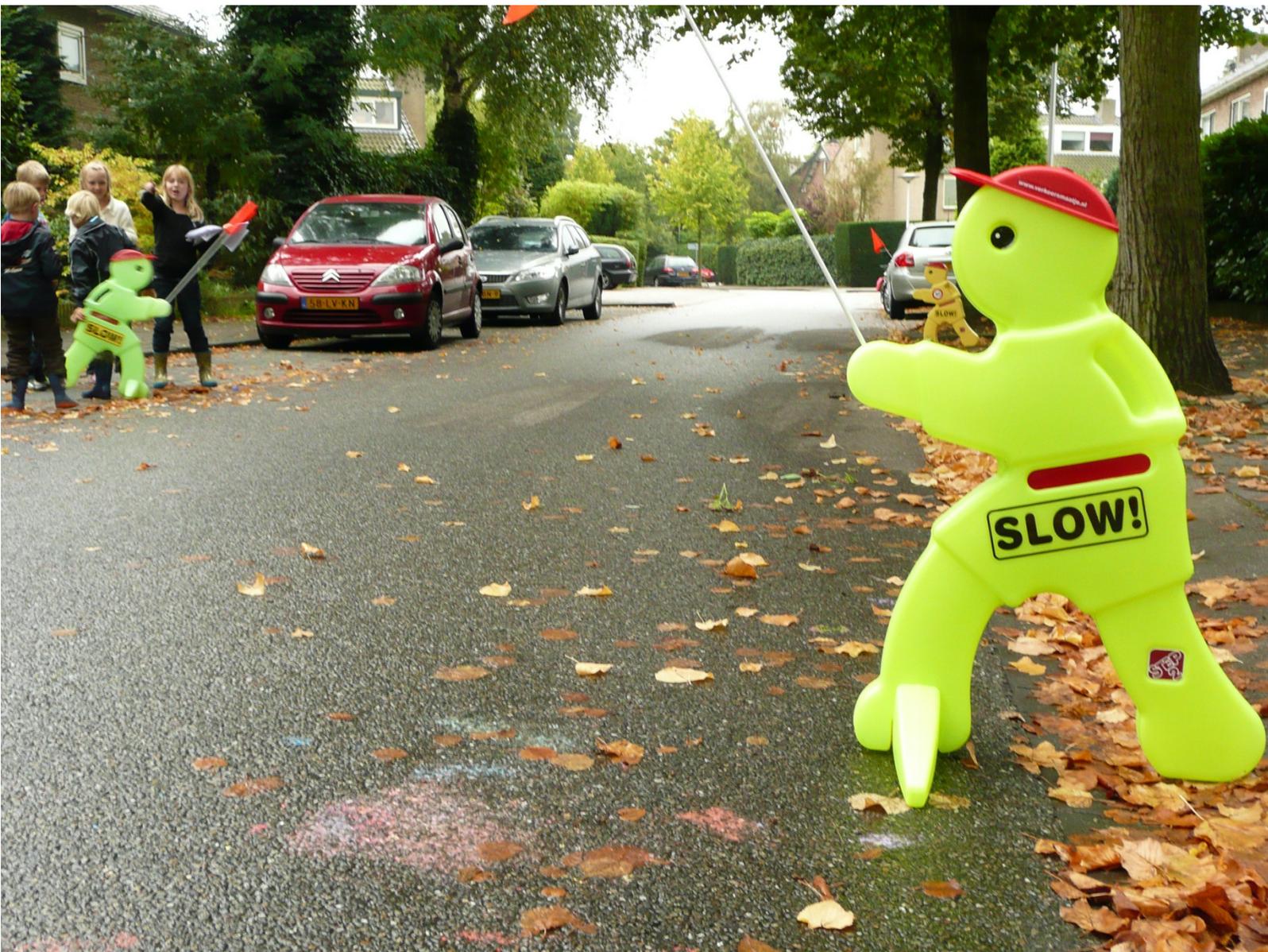


Roaming around the neighborhood

Increasing children's independent mobility by targeting care takers' perceptions of the neighborhood in interventions



Mathijs Mulder
s2749181

Bachelor thesis
Spatial Planning & Design

Supervisor: dr. F. Niekerk



university of
 groningen

faculty of spatial sciences

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Author	Mathijs Mulder s2749181 m.mulder.23@student.rug.nl
Study University	Ba Spatial Planning and Design University of Groningen Faculty of Spatial Sciences
Supervisor	dr. F. Niekerk f.niekerk@rug.nl
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Abstract

This research aims to provide insights into how care takers' perceptions of the physical environment can be used to increase the allowed independent mobility of children in Beijum and the Oosterparkwijk, two different neighborhoods in Groningen. The two neighborhoods are compared and the differences between them will be described. Data for this comparison have been collected via a survey among care takers in the two neighborhoods. Next to the collected data, a review of literature has been done in order to describe why the independent mobility of children is important and how it can be increased.

It is well-known that playing outside, is beneficial for the development of children. On top of that, unsupervised playing helps them to develop skills they need in a later stage in life. However, the boundaries that children get imposed, limit them in their independent mobility (Vlaar et al., 2019). The independent mobility is an essential part for children to learn social skills and to stay healthy both physical and mental. Care takers heavily influence their children, aware and unaware. With that they also influence how their children see the physical environment. Most care takers give their children rules and boundaries for when they go outside unsupervised. Those rules and boundaries mostly relate to car infrastructure and the need to find their children when needed. Especially the extension or elimination of those boundaries have a positive influence on a child's independent mobility. This can be done by including "woonerven" in the design of a neighborhood, prioritizing pedestrian and cyclist networks and implementing child friendly infrastructure such as a "Kindlint". The comparison between Beijum and the Oosterparkwijk shows that care takers in Beijum perceive less obstructions to the allowed independent mobility of their child than care takers in the Oosterparkwijk.

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Chapter 1: Introduction

1.1 Background

In the past years the importance of outdoor playing for children has been stressed several times. Especially since it is evident that modest amounts of physical activity contribute to the well-being and health of children (Janssen & Leblanc, 2010). This can be seen in reduced depression, obesity and cardiovascular risk factors. However, the number of children that play outside has declined in the period from 2013 to 2018 as showed in research by Jantje Beton (2019). In the research by Jantje Beton, researchers found that children, aged four to fourteen, on average play outside for 8,4 hours per week. Although this is more than the recommended sixty minutes per day, researchers found that 58% of the children in the response group play outside for less than 8,4 hours. Even more worrying is that 15% of the children never plays outside. Data collected by the Dutch National Institute for Health and Environment, supports the data found by Jantje Beton (2019). Data for 2019 shows that 56% of the children aged 4 – 11 achieves the sixty minutes of moderately intensive exercise (RIVM, 2020). A publication by Kennisplatform Verkeer en Vervoer (2008) expresses the worry of the limited outside play areas in neighborhoods. Existing play areas are removed to make room for buildings or parking areas, resulting in an increased distance to the remaining play areas. In research by Vlaar et al. (2019) it's stated that a parents' perception of the environment is an important factor in explaining the physical activity their child engages in.

In existing research there has been limited attention for if and how the perceptions in a suburban neighborhood differ from the perceptions in a city neighborhood. In the city of Groningen, Beijum (figure 1) is a suburban neighborhood that was built in the late 1970's, focusing on the "woonerfgedachte". It was planned with low rise housing, a lot of public green and with car infrastructure that leads the cars around smaller residential areas (Schroor, 2009; Gemeente Groningen, 2013). Beijum is a neighborhood mostly developed for families with children, which is in line with the "woonerfgedachte". The spacious design with a lot of green makes it an ideal place for families with children (M3H Architecten, 2012).



Figure 1: Location of Beijum

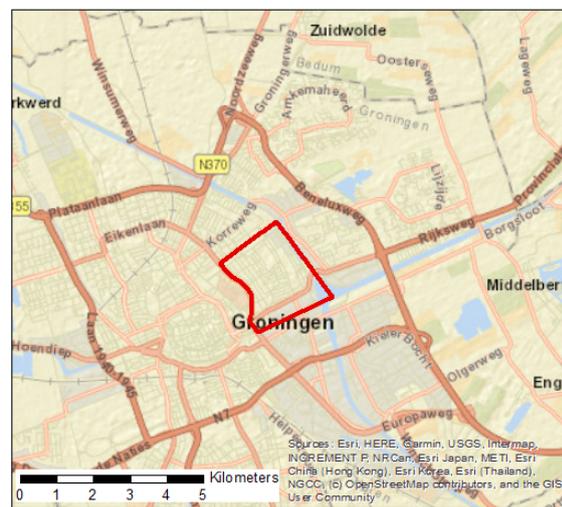


Figure 2: Location of the Oosterparkwijk

The Oosterparkwijk (figure 2) is a city neighborhood which has been developed in the early 1900's to counter the housing shortage in the city (Schroor, 2009; Gemeente Groningen, 2012). The design of the neighborhood was mainly driven by economic and infrastructural motives, which we can still see in the straight roads (f.e. Oosterhamrikkade, Gorechtkade and Zaagmuldersweg). With the development of the area "De Velden" in the Oosterparkwijk, this neighborhood added a lot of single-family homes (Bewonersorganisatie Oosterpark, 2020).

Since both neighborhoods try to attract families with children, it is relevant to see how the care takers¹ perceive the neighborhood, in order to provide (future) neighborhood developments, focusing on families with children, with recommendations on which aspects of the perceived environment need to be targeted.

1.2 Research Problem

This research contributes to explaining which part a care takers' perception on the physical environment plays in the allowed independent mobility of a child as explained by Vlaar et al. (2019). This will be done by doing research in two different neighborhoods in Groningen. Determining what parts of the physical environment care takers see as a threat or as an opportunity to outdoor playing, might help in eliminating those threats and using the opportunities in future developments or neighborhood renewals. By comparing two neighborhoods, different influential aspects of a care takers' perception might emerge. The focus in this study will be on care takers who raise (a) child(ren) aged five to twelve.

The main question that helps researching this problem is:

How can a care taker's perceptions of the built environment, influence a child's allowed independent mobility in Beijum compared to the Oosterparkwijk?

The sub questions that will be helpful in answering the main question are:

- *What are the physical barriers care takers perceive in their neighborhood?*
- *What can be changed, according to care takers in Beijum and the Oosterparkwijk, in order for care takers to allow their children to roam more freely?*
- *What are the differences in a care takers' perception between Beijum and the Oosterparkwijk?*
- *How do care takers' perceptions relate to a child's allowed independent mobility?*
- *How can a care takers' perception help in the (re)development of (future) neighborhoods?*

1.3 Relevance

In recent years there has been a lot more attention for exercise and outdoor playing of children. According to the RIVM (2020) and Jantje Beton (2019) almost half of the Dutch children going to primary schools does not get enough exercise. Resulting in obesity or in some cases even mental health problems (Mutrie and Parfitt, 1998, in Biddle et al., 2004). To counter this, urban form might help in providing more opportunities for exercise. According to Vlaar et al. (2019), it is especially useful to target perceptions of parents, in order for them to provide them with unsupervised outdoor playing.

Future interventions to increase a child's unsupervised outdoor playing could focus on the change of a care taker's perception of the environment to influence the allowed independent mobility, which is supported by the research of Van Loon and Frank (2013). However, the research does not recommend for which aspects need to be targeted to change the perceptions of care takers. A research on how care takers' perceptions of the built environment differ in two neighborhoods, is especially interesting. It might explain if and how different urban forms influence a child's allowed independent mobility. The research into these two neighborhoods might give insights in how similar neighborhoods can be developed. By looking at the similarities and differences in care takers' perceptions between these neighborhoods we can make predictions for similar neighborhood developments. Please note that this research is specific for these two neighborhoods so derived conclusions might not be exactly the same for other neighborhoods.

¹ In this research the term care taker is used instead of parent. The term care taker broadens the perspective by also including foster parents and other relatives (f.e. grandparents) that take care of a child.

1.4 Structure

Within this paper the main and sub questions will be elaborated on consecutively. In order to do so, the second chapter will discuss the relevant concepts for this research and those concepts together will form a theoretical framework. With the help of the different discussed concepts a conceptual model is formed, which aims to explain the basis of this research. Chapter three explains the methodology used for the research and this will provide an explanation of how this research is executed. The different means of data collection and data analysis are explained in this chapter, together with any ethical aspects this research might have encountered. Chapter four will delve into the results, by elaborating on the collected data this chapter answers the secondary questions as stated in chapter one. Chapter five will contain the most important findings and an answer to the central question as stated in paragraph 1.2. Chapter six will contain a reflection on this research and recommendations for future research.

Chapter 2: Theoretical framework

2.1 Importance of physical activity

Physical activity is important for children, especially during their growing years (Hills et al., 2007; Page et al., 2010), because it contributes to a child's physical health. However, more important is the influence on children's mental and social development, since it reduces symptoms of depression and possibly stress and anxiety (Dunn et al., 2001). On top of that, physical activity also has a positive influence on self-confidence, self-esteem, energy levels, sleep quality, the ability to concentrate (Shilton & Naughton, 2001, in Hills et al., 2007), life satisfaction, happiness and social skills (Westman et al., 2019). In a literature review by Mutrie and Parfitt (1998, in Biddle et al., 2004), the researchers conclude that children who are physically active are less likely to suffer from mental health problems. Similar research among adults shows similar effects on mental health (Biddle & Mutrie, 2001, in Biddle et al., 2004). Westman et al. (2019) state that active modes of travel have a positive effect on psychological and cognitive domains of well-being. They note that outcomes in these studies with adults are comparable to the studies conducted with children. This research states that physical activity influences health and well-being of children in a positive way, as concluded by most of the mentioned authors.

2.2 Influence of the urban environment

The research by Van Loon and Frank (2011) provides a conceptualization of how the built environment influences the physical activities of children. According to the authors, the built environment consists of two aspects: access and design. Access consists of the facilities in the proximity and of the connectivity of a place. An area with a higher density may result in higher active movements since it is easier for children to access facilities by foot or bike. For example, when a park which is located closer to where children live, it may be used more frequently. When looking at design, we might see wider streets as barriers. On top of that, the design of a playground or park can contribute to being visited more often (Ridgers et al., 2007, in Van Loon & Frank, 2011). According to Spence and Lee (2003, in Van Loon & Frank, 2011) higher-level interventions on the physical environment influence more people as opposed to interventions on a lower-level. Lower-level interventions will focus more on specific streets where the benefit is for the residents in that street, whereas people from all socioeconomic backgrounds can profit from the higher-level developments of new parks or other freely accessible public infrastructure. An additional benefit from interventions focused on increasing physical activity among children and adolescents, is that adults may also benefit from these interventions, which may result in higher physical activity among older people as well. Important to note is that interventions in the environment alone may not be enough. Van Loon & Frank (2011) state the necessity to target the perceptions of people as well, to align these perceptions with the objective characteristics of the environment.

2.3 Independent Mobility

Whereas the research by Van Loon and Frank (2011) provides an explanation on how the urban environment influences physical activities by children, the research by Vlaar et al. (2019) gives insights in how a care taker's perception of the neighborhood influences the territorial range of their children. Vlaar et al. (2019) state that independent mobility contributes to engaging in active transportation and playing outside, both of which positively influence "physical activity, interaction with the environment, development of cognitive skills and social interaction". These aspects are important for the well-being of children, but also for their health according to Janssen & Leblanc (2010). Schoeppe et al. (2014) also state the importance of independent mobility in the development of cognitive skills, social skills, decision making and spatial and traffic safety skills.

The concept independent mobility is split into two variants by Vlaar et al. (2019): allowed independent mobility and actual independent mobility. Actual independent mobility is conceptualized with the term

territorial range (the area in which a child can move free from supervision). Allowed independent mobility is indicated by boundaries set by care takers and the neighborhood as perceived by the care taker. When care takers have a more positive perception of the environment, they are more likely to allow their children to roam for larger distances (Vlaar et al., 2019) and those larger distances are associated with a higher independent mobility. However, there should be noted that license for independent mobility as given by care takers is mostly measured by the allowed activities not by where children are allowed to go (Bhosale et al., 2017, in Vlaar et al., 2019). On top of that, the aspect of ‘stranger danger’ (being afraid of the child being taken or hurt by a stranger) is especially associated with a limitation of the independent mobility of a child. On the other hand, a larger number of neighborhood relations and the presence of designated walking facilities contribute to allowed roaming as well. The study showed that roaming allowance was a great predictor for the actual distances their children roamed, showing the importance to target parental perceptions in increasing the independent mobility of children.

2.4 Conceptual model

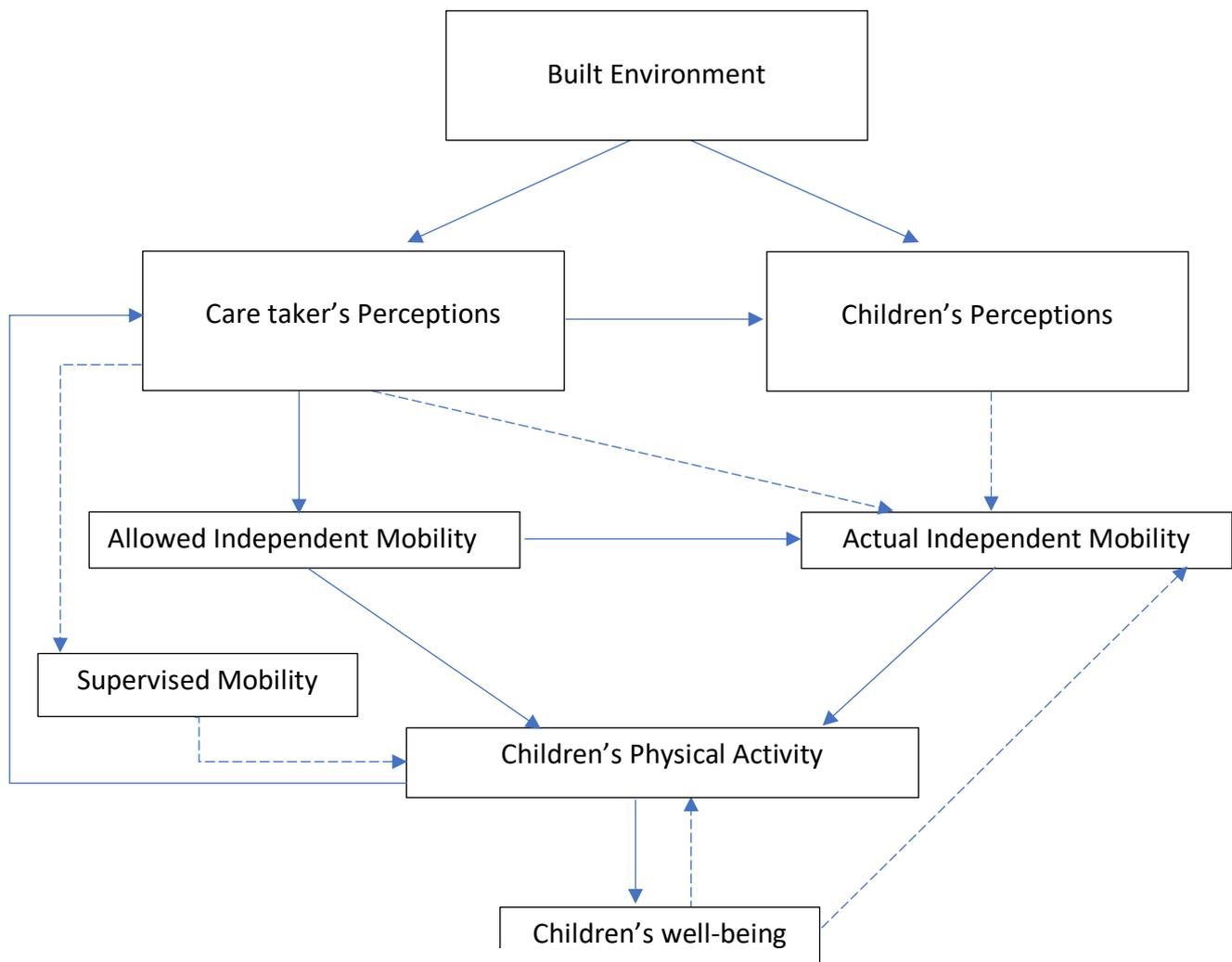


Figure 3: Conceptual model

This research aims to explain the effect of the built environment on a care taker's perception. As stated in the paragraphs preceding this model, the care taker's perceptions on the built environment will in turn influence the independent mobility of their children. Independent mobility can be split into allowed and actual independent mobility. With tracking actual independent mobility being hard without the use of GPS and within a short period of time, this research mainly aims at describing the influence on the allowed independent mobility. The focus will be on to what degree care takers let their children roam the neighborhood unsupervised, therefore the influence of a care takers' perception on how their children perceive the neighborhood, will not be considered. Supervised mobility is also of influence to children's physical activity. However, this research aims to explain the importance of the independent mobility of children. Therefore, supervised mobility is not included in this research. Altogether this resulted in a conceptual model as seen in figure 3.

Chapter 3: Methodology

3.1 Data collection

This research is a case study, which compares two different types of neighborhoods in the city of Groningen: Beijum and the Oosterparkwijk. It is interesting to see how these historically different neighborhoods may lead to differences or similarities in the influences of care takers' perceptions of the built environment on the allowed independent mobility of children between the age of 5 and 12 years. Characteristics of the population could also have an influence on the perception of care takers. However, these characteristics are more or less the same for both neighborhoods according to data from the CBS (2019). The research will be done by a combination of quantitative and qualitative research methods. The use of a quantitative method is chosen to get a more general view of both neighborhoods to possibly derive general conclusions for those neighborhoods. Next to that a qualitative method can be used to get a more detailed view of the perceptions in the neighborhoods.

3.1.1 Multiple choice and multiple answer questions

The use of surveys is useful to explain the perceptions of care takers' in a more general way. On top of that, care takers' might be more willing to fill in a survey, because it forms a lower threshold for participating as compared to interviews. The survey consists of two parts (Appendix 1), the first part is about freedom of movement and the second part is about positive influences and barriers that care takers recognize in the neighborhood. In both parts care takers will be given statements to which they have to reply to what degree they agree or disagree with the statement. Next to that, two multiple answer questions are included to identify positive influences and obstructions that care takers perceive to the allowed independent mobility of their child(ren).

3.1.2 Open questions

Next to the multiple choice and multiple answer questions, the survey contains open questions. Since it is difficult to measure perception, this allows the interviewees to explain their perceptions of the environment in more detail, giving a more qualitative view on the neighborhoods. In these open questions the respondents are asked what they think of the identified barriers and positive influences in the built environment, why these places influence the degree to which they allow their child to move around independently and why they perceive the barriers as such. Moreover, the open questions provided the opportunity to ask care takers what they want to change to allow their child to move beyond those barriers and what the strengths are of the place they identify as a positive influence. Open questions provide respondents with the means to express their reasoning more accurately as opposed to fixed-response multiple choice questions (Clifford et al. 2010).

3.1.3 Maptionnaire maps

In these surveys, maptionnaire maps are included so care takers can map the allowed independent mobility of their child and point out areas in the physical environment that influence their child's allowed independent mobility. By using a maptionnaire there is a possibility to ask respondents to mark the boundaries to their child's allowed independent mobility and to let respondents mark points which they see as an extension or limitation to the allowed independent mobility of their children. This provides the opportunity to see if different respondents identify the same or similar reasons for the allowed independent mobility of their children. The data of the maptionnaire can be easily processed using Geographical Information Systems (GIS), this allows for the data to be visualized after which patterns might emerge (Clifford et al. (2010). In the first maptionnaire map, the respondents will be asked to identify the area where their child is allowed to move around in unsupervised (allowed independent mobility), this is included to see if respondents give their children similar boundaries. For the second map, care takers are asked to mark the dangerous traffic situations they experience within their neighborhood. The third and fourth map are linked to the multiple answer questions about the positive influences and obstructions that care takers experience. These maps provide them with the

option to point out the areas they listed in the multiple answer question. All maps are included to help identify similarities and differences between the received responses.

3.1.4 Approach

To recruit respondents, the survey has been supplied to care takers in Beijum and the Oosterparkwijk by distributing flyers with a QR-code and a link to the survey, door-by-door in these neighborhoods. In the first week of May, 250 flyers (Appendix 2) were distributed per neighborhood. In trying to approach as many care takers as possible, most flyers were distributed to houses where children seemed to live. Especially houses with visible toys, playing equipment and/or children's bicycles were targeted. Next to the flyers, the survey was posted on social media and different organizations were contacted. The organizations that were contacted are WIJ Oosterparkwijk, WIJ Beijum, the St. Fransiscusschool, cultural organization De Wijk De Wereld, playground association SV Oosterpark and residents' organization Oosterpark. This resulted in 36 respondents of which 24 respondents replied to all statements (Appendix 3). The response to the survey is too low to say something about the populations, but this was not the intention of this research, since it has an exploratory nature. Unfortunately, only 17 respondents used the maptionnaire maps of which only five people used all maps. Of those 17 respondents to the maptionnaire maps, seven respondents replied for Beijum and ten respondents replied for the Oosterparkwijk.

3.2 Data analysis

The data that is collected through the survey, is analyzed using descriptive statistics. The reply possibilities for the statements in the survey are presented as ordinal data to categorize the perceptions of the respondents. The open questions are related to the statements answered before them, giving useful insights in why respondents agree or disagree with the statements. Next to the total response to the multiple choice and multiple answer part of the survey, the response is also split in Beijum and Oosterparkwijk, to identify differences and similarities between both neighborhoods. Response for the questions are translated in a percentage of total respondents per neighborhood. The descriptive statistics of the survey data, the GIS maps and the review of literature, are used to research the main question and its sub questions.

3.3 Ethical considerations

This research contains data about the mobility of children, therefore it is important to consider the ethics of this research. Paramount is that the identity of the respondents to the survey will be anonymized and that participation will be completely voluntary. If desired, respondents can receive a summary of the research results.

The research was conducted during the outbreak of COVID-19, therefore social distance measures had to be taken in to consideration. Reaching respondents had to be done via digital means or via means which do not require physical meetings.

Chapter 4: Results

4.1 Perceived physical barriers in the neighborhoods

Care takers limit their child’s independent mobility to barriers they perceive. A study in four European countries by Fyhri et al. (2011) concludes that most care takers limited their child’s mobility because of the perceived traffic danger. This is something which can also be seen in the response to this research’s survey. More than half of the respondents are worried that their child will encounter dangerous traffic situations, even after also stating that the environment they live in is safe enough for their children to go out unsupervised. When asked what limits the allowed independent mobility of their children, the most prevalent answer is that children are not visible for their surroundings (especially for road users), closely followed by roads with a speed limit over 30 km/h. When looking at the maptionnaire responses (figure 4 and 5; for enlarged version see Appendix 4) especially the last factor is observed. The roads which are meant for through traffic are mostly straight asphalt roads, which have no traffic calming measures to ensure motorized vehicles conform to the speed limit of 50 km/h. In Beijum this is the ring road which connects the different “woonerven”² areas. The seven maptionnaire respondents from Beijum, identified dangerous traffic situations along this ring road (figure 4). The identified area of danger in the figure, is stated by the respondent to be an area with a lot of criminality and drug dealing. In the Oosterparkwijk, the ten maptionnaire respondents mostly see the Zaagmuldersweg as an area of danger, with multiple dangerous traffic situations (figure 5). Next to that, they also identify dangerous traffic situations on roads with a speed limit of 30 km/h, mentioning the lack of traffic calming measures to make sure road users adhere to the speed limit. With regards to the positive influences on the area of independent mobility, maptionnaire respondents marked locations which are mostly free of cars (parks, “woonerven” and a shopping area). Respondents mention the absence of cars and the room for children to play freely, when they are asked to support why they identified the location as a positive influence.

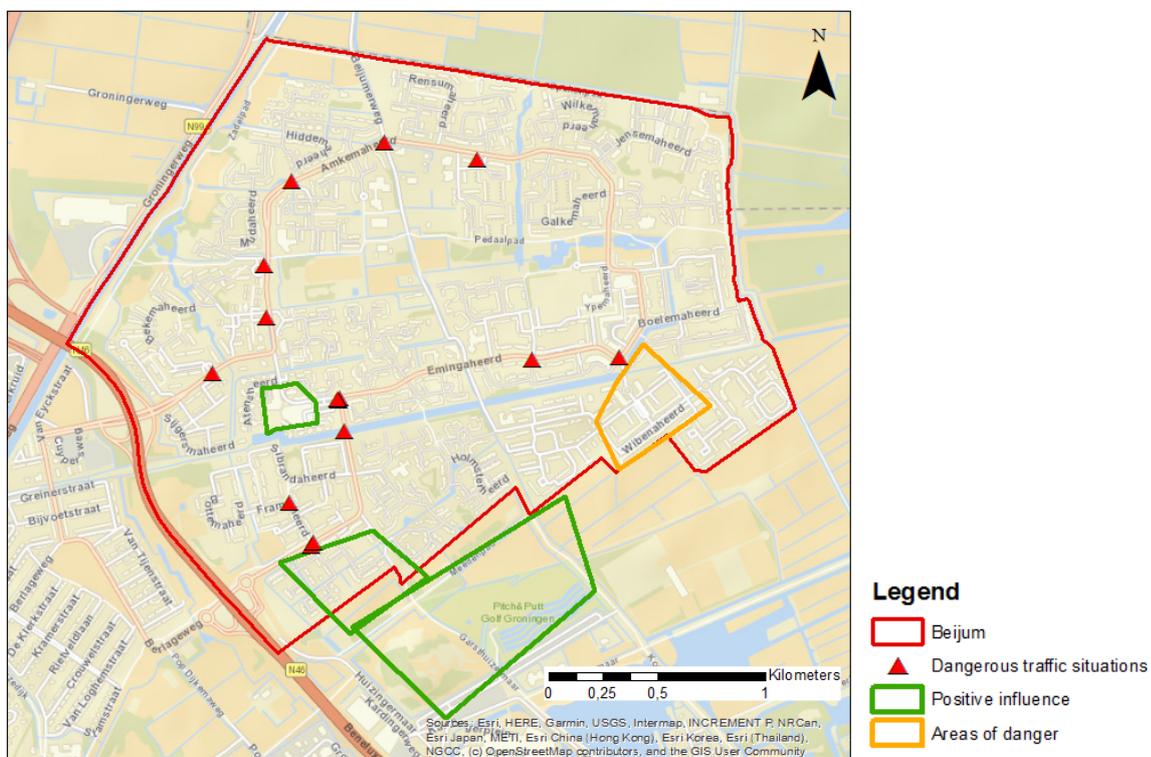


Figure 4: Maptionnaire response for Beijum

² “Woonerven” are residential areas with 15 km/h speed limit zones for destination traffic

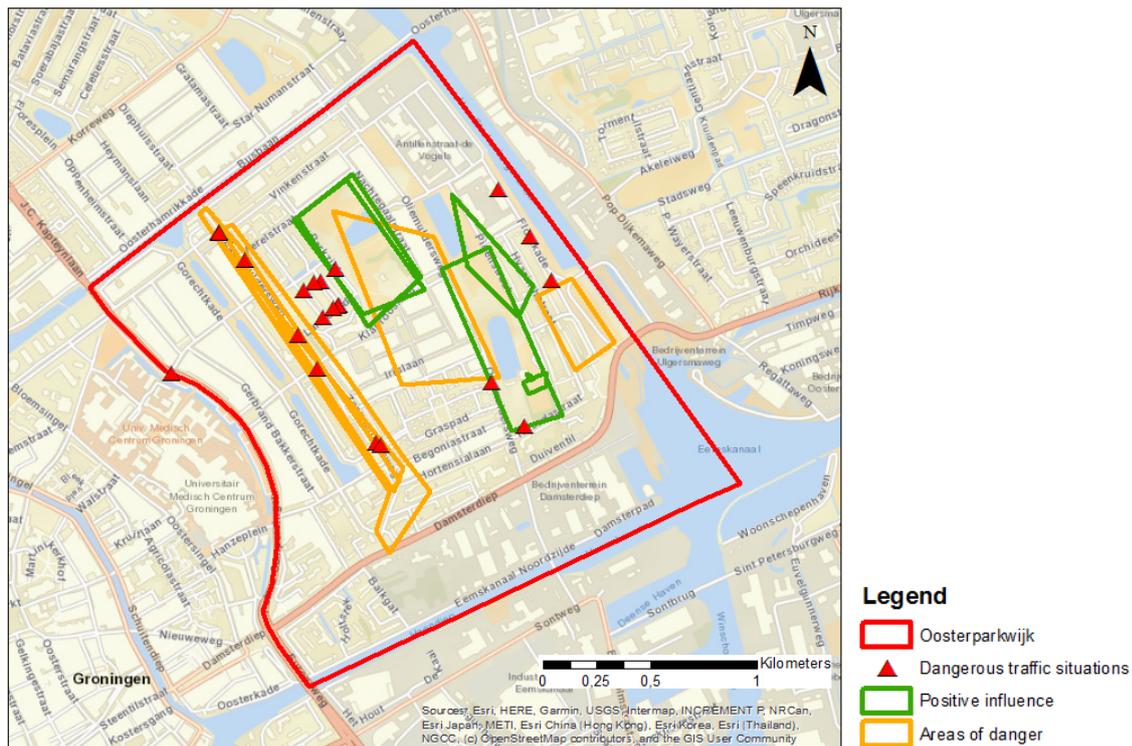


Figure 5: Maptionnaire response for the Oosterparkwijk

A map with registered traffic accidents by STAR (2020) shows a similar pattern. Most traffic accidents take place at those long asphalt roads with a higher speed limit. This might also be a reason for care takers to identify these roads as a barrier to their child. On top of that, almost half of the respondents, state that the absence of pedestrian crossings and the absence of a clear separation between car lanes, cycling path and sidewalk are an obstruction to the allowed mobility of their child. According to the publication by Kennisplatform Verkeer en Vervoer (2008), especially all things related to traffic are a threat to children. Children are shorter than grownups and therefore they see the world in a different perspective. Children cannot look over hedges and parked cars, giving them a limited view on their surroundings. Next to that they continue to state that children have difficulties locating sounds and estimating speeds, making it harder for them to participate in traffic. Therefore, the perspective of children is needed in urban design, to mitigate these risks.

4.3 Proposed changes to the environment by care takers

Respondents were asked what they want to change in their neighborhood in order for them to provide their child with a larger area for independent mobility. Eleven out of thirteen respondents proposed measures which relate to the infrastructure. The addition of more pedestrian crossings, traffic calming measurements and a lower speed limit are most prevalent. The respondents all mention one or more of those measures. Three of those eleven respondents even go as far as making the neighborhood (semi) car-free, giving more space to pedestrians and cyclists. These measures are all in line with the afore mentioned barriers that care takers perceive, not only in this research but also in other research (Fyhri et al., 2011). Two respondents from Beijum that did not mention measures with regards to the physical environment state that the physical environment is not really their biggest problem. They think drug dealing, shady people and loitering of youth is a bigger problem. The problems these care takers see might have overshadowed the obstructions they experience with regards to the physical environment. Therefore, they might not have proposed changes to the physical environment. Research by Kneeshaw-Price et al. (2015) shows that crime-related safety and stranger danger is influencing parental perceptions of the neighborhood, resulting in decreased physical activity of children. When including care takers in the process of environmental changes, this is an aspect which needs to be included as well.

4.4 Differences and similarities between Beijum and the Oosterparkwijk

Looking at the history of the two neighborhoods, they differ a lot from each other based on why and how the neighborhoods were built. With the introduction of the Housing Act in 1901, Groningen was able to do something about the poor living conditions and the shortage of houses in the city. The Housing Act made it mandatory for municipalities to draft expansion plans for their city, in which they planned the houses, streets, canals and squares (Van der Cammen & De Klerk, 2003). The Oosterparkwijk was built between 1919 and the 1950's and the different parts were all built by the municipality or housing agencies as a reaction to the housing shortage in the city. Features which can still be seen are the straight long roads and the similar housing types (Schroor, 2009). These features give away that the neighborhood was completed according to the original expansion plan and show the economic way of thinking while planning the neighborhood (Hacquebord & Overbeek, n.d.).

The neighborhood Beijum was built according to the “woonerf” thought. In the 1970's neighborhoods were no longer focused on concentric growth of cities and they became more decentralized neighborhoods, with their own facilities. Beijum is a green neighborhood with different “woonerven” and was specifically planned for families with children (Schroor, 2009). The “woonerven” were linked by a ring road, resulting in areas which were only used by destination traffic, resulting in ideal places for children to play. According to Van der Cammen & De Klerk (2003) these neighborhoods were believed to be more livable than the neighborhoods that were built up until the 1970's.

The different ideas for planning the two neighborhoods, leads to the assumption that there are differences between them. Paragraph 4.1 states that only 74% of the respondents agree with the statement to let their child go outside without supervision. When the respondents are divided into the neighborhood they live in, another pattern emerges. In the Oosterparkwijk 59% of the respondents (partially) agrees with the statement, whereas 90% of the respondents from Beijum (partially) agrees with the statement. Next to that, the difference might be explained in how these neighborhoods were built. Neighborhoods with “woonerven” such as Beijum have child friendly qualities. Especially the play areas at block level, short distances to schools, safe cycling paths and green areas make it so children can start playing independently and safely at a young age (PBL, 2014). The Oosterparkwijk has a lot of those qualities as well. However, the problem is that those qualities are further away or are only accessible after crossing one of the roads that is perceived as a threat. The biggest difference between the two neighborhoods is the structure of the living areas. The straight roads of the Oosterparkwijk allow for traffic to cross living areas in whatever way they please, whereas the secluded “woonerven” in Beijum have one street, which is both the entry and the exit, limiting traffic to destination traffic. This positive influence of “woonerven” is also seen in the response of the survey, since 74% of the respondents think a “woonerf” is a positive influence on the allowed independent mobility. This might also explain why certain obstructions to independent mobility are perceived. Only 14% of the care takers in Beijum see the absence of sidewalks as an obstruction, as opposed to 44% in the Oosterparkwijk. On top of that, the perceived obstruction “the absence of a division between sidewalks, cycle paths and/or car lanes” is more prevalent among respondents from the Oosterparkwijk with 56%, as opposed to 29% among respondents from Beijum. With the inclusion of “woonerven”, sidewalks and a division between different modalities might not be necessary.

This leads to another difference between the different neighborhoods: dangerous traffic situations. In the Oosterparkwijk 66% of the respondents (partially) agrees to the statement “I am afraid my child will be in dangerous traffic situations.”, with the other 34% being neutral. In Beijum no respondent fully agrees and 53% partially agrees with the statement, with 8% being neutral and 37% (partially) disagreeing. This shows that respondents from Beijum perceive their neighborhoods safer with regards to traffic situations than respondents from the Oosterparkwijk. Percentages on the age group of the children give a possible explanation since 95% of the respondents from Beijum have a child in the age groups 9-10 and 11–12 years old, whereas the same age groups have respectively 31% and 0%

for the Oosterparkwijk (figure 6). Next to the difference in age, the data from STAR (2020) shows that the Oosterparkwijk has more registered accidents than Beijum. Showing that the number of accidents is possibly contributing negatively to the perceived safety in the Oosterparkwijk.

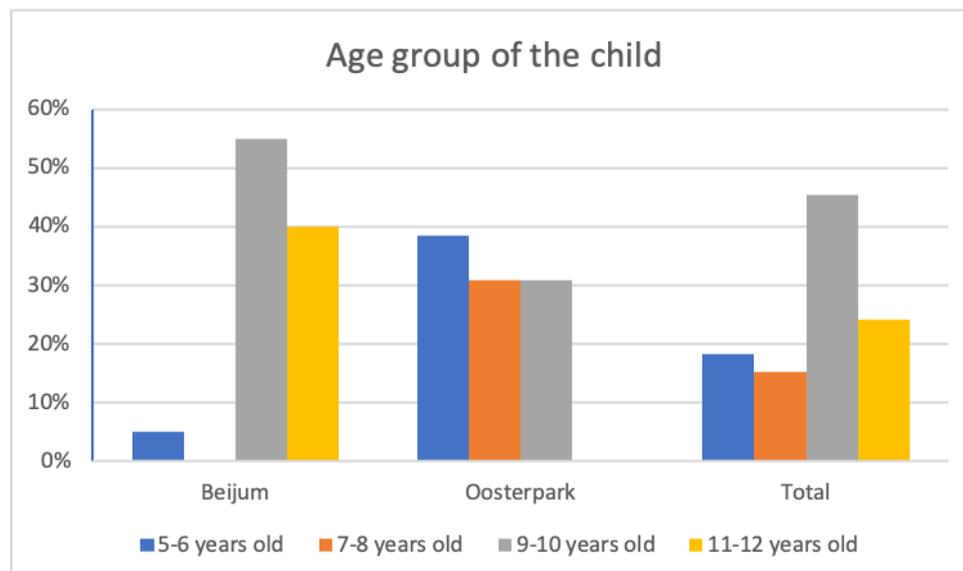


Figure 6: Age group of the child divided per neighborhood

4.5 Neighborhood (re)development with the help of care takers

Care takers in this research see a lot of threats to their children, but they also state that they find it important for their children to develop their skills by independent outdoor playing. However, these threats force the care takers to provide their children with boundaries, limiting their independent mobility in their neighborhood. When (re)developing neighborhoods, these threats can be mitigated, providing a larger area of mobility for children.

Since care takers mostly see the infrastructure as a barrier, that is where (re)development should start. Respondents state that “pedestrian and cyclist crossings are dangerous” and “cars speed a lot”. According to Verkeersplatform Verkeer en Vervoer (2008), Houten is a very well-known example of how to deal with child friendly infrastructure. By providing a network in which cyclists and pedestrians have right of way and cars are redirected to a ring road at the edge of the built-up area, moving through Houten is easier and more comfortable when being on foot or using a bike. On top of that, all the facilities (f.e. libraries and schools) are located along the cycling network, limiting the areas where different modalities have to cross. This structure can be partly seen in Beijum, however, the ring road is in between the different “woonerven”, leaving people living on the outer side of the ring road with the threat of the infrastructure, when they want to make use of the facilities in the center of the neighborhood.

Next to limiting the infrastructure for cars, it is important to make children visible for their surroundings and give them safe areas to cross roads. The survey shows that 79% of the respondents, see the visibility of children as a positive influence for the allowed independent mobility. Next to that, 78% of the respondents see it as an obstruction for the independent mobility when their child is not visible for its surroundings. An example of how to do so is the so called “Kindlint” (“child line” in English). A “Kindlint” is a child friendly route through a neighborhood which connects play areas, playground equipment, schools and other child destinations (OTB, 2008 & Verkeersplatform Verkeer en Vervoer, 2008). This provides children with the means to move and play independently in a neighborhood.

Chapter 5: Conclusion and discussion

The central question to this research is: **How can a care taker's perceptions of the built environment, influence a child's allowed independent mobility in Beijum compared to the Oosterparkwijk.** This research shows the importance of care takers' perceptions of the environment, since care takers provide their children with boundaries when it comes to outside playing. The perceptions that mostly influence these boundaries focus on the infrastructure of the neighborhood. Especially larger infrastructure is seen as a threat, which is with research by Van Loon & Frank (2011). Car traffic and car infrastructure are the biggest perceived threat to the children by care takers in this research. Care takers provide the children with this infrastructure as a physical barrier which they are not allowed to cross.

To extend the allowed independent mobility of children, the afore mentioned barriers need to be eliminated or placed in such a way that they are easily crossed by children (OTB, 2008). In doing so, care takers might perceive the physical environment as safer, allowing their children to have a larger area of independent mobility as is stated by Vlaar et al (2019). Mitigating these threats can be done by (partially) prohibiting cars in the area or by providing save places for children to cross the existing barriers. Making barriers easier to cross can be achieved by removing obstacles so children can be spotted better by other road users and vice versa, which is concluded by both OTB (2008) and Verkeerplatform Verkeer en Vervoer (2008). Next to that, this research shows the positive influence care takers perceive with "woonerven". By including these 15 km/h speed limit zones for destination traffic, children are provided with safe places for outside playing. However, this is not shown by other research on the perceptions of care takers on the built environment. The comparison between Beijum and the Oosterparkwijk shows that care takers in Beijum perceive less obstructions to the allowed independent mobility of their child than care takers in the Oosterparkwijk.

Chapter 6: Reflection and recommendations

This research took place for two specific neighborhoods in Groningen, therefore results found in this case study may be different from other research. On top of that, this research took place during the COVID-19 outbreak. During the outbreak it was not possible to approach care takers on the street and it was advised not to contact schools for help in distributing the survey. Due to these measures, respondents needed to be reached through social media, other organizations and with the use of door-by-door flyers. If similar research was to be done, the help of organizations such as schools might help in getting more response to statistically analyze the quantitative data. For this research the St. Franciscusschool was the only school that was contacted, because of personal contacts. With the measures regarding COVID-19 schools were working hard to provide children with home education, therefore contacting school was strongly discouraged. However, with the help of schools, it is easier to approach respondents for similar research. Moreover, care takers might be more willing to participate in a survey if it is supported by the school their child attends.

Unfortunately, doing interviews for this research had to be canceled and replaced by open ended questions for the collection of qualitative data. This research was supposed to have four semi-structured interviews with care takers from both neighborhoods. With the use of semi-structured interviews, there would have been more flexibility in following the direction chosen by the interviewee (Clifford et al., 2010) instead of a guided open-ended question. In future research, interviews could be added to get a more detailed view of what aspects of the built environment influence parental perceptions and therefore also the allowed independent mobility of children. Since it is difficult to measure perception, this allows the interviewees to explain their perceptions of the environment in more detail, whereas the responses to the open-ended questions in this research were mostly short and with catchwords.

Furthermore, with future use of maptionnaire maps, it is advised to let respondents fill in the survey when the researcher is present. In this way the researcher is able to help respondents with problems they encounter when filling in the survey. For this research only seventeen respondents used the maptionnaire maps, of which only six used multiple maps. When making use of the maps it might be useful to advise respondents to complete the survey using a computer or tablet, instead of a smartphone. A smartphone can be used, but the maps do not always respond as they should on the small screens and the use of a bigger screen could improve the accuracy of the response. This could improve the overall accuracy of the results. The inaccurate responses together with the low response rate in this research, made it almost impossible to interpret the maps for independent mobility.

There are some influences on the perceptions of care takers, which came up during this research. One of those is perceived social safety in a neighborhood. This could also have an influence on the allowed independent mobility of children. This was not included in this research, but it could give useful insights in future research into Beijum, the Oosterparkwijk and other neighborhoods, since some of the respondents in this research also mentioned those social aspects of the neighborhood. Next to that, age and gender of the child might be of influence on a care takers' perception. This research shows an indication of a possible influence of age of the child. Therefore, it is advised to include these characteristics of the children in further research.

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Appendices

Appendix 1: Survey questions and maptionnaire

This research was conducted among care takers in Beijum and the Oosterparkwijk in Groningen, the Netherlands. Therefore, the questions in the survey were in Dutch. The questions in this appendix are translated from the original Dutch questions.

General

If you have multiple children, you can take one of the children in mind when answering these questions.

My child is in the age group

- 5-6 years old
- 7-8 years old
- 9-10 years old
- 11-12 years old
- I prefer not to say

My child is a

- Boy
- Girl
- I prefer not to say

My postalcode is

Freedom of movement

My child is allowed to go into the neighborhood without my supervision.

- Agree
- Partially agree
- Neutral
- Partially disagree
- Disagree

I think it is important for my child to go outside independently.

- Agree
- Partially agree
- Neutral
- Partially disagree
- Disagree

Why do you think it is or is not important for your child to go outside independently?

I find it important to state to which distance my child can go from home, if he/she is going outside independently.

- Agree
- Partially agree
- Neutral
- Partially disagree
- Disagree

Why do you think that stating that distance is or is not important?

Click on the grey area below to go to the map.

Area of independent mobility of your child 

By making a rectangle you can indicate the area where your child is allowed to move in unsupervised.

Positive influences and obstructions

The environment is safe enough for my child to move through the neighborhood independently.

- Agree
- Partially agree
- Neutral
- Partially disagree
- Disagree

I'm afraid my child will end up in dangerous traffic situations.

- Agree
- Partially agree
- Neutral
- Partially disagree
- Disagree

Click on the grey area below to go to the map.

Dangerous traffic situations 

Click here to continue. By placing a pin, you can indicate where dangerous traffic situations occur. It is possible to place multiple pins by clicking this question again.

Why do you find the indicated traffic situation(s) dangerous?

This is a positive influence on the allowed independent mobility of my child:

- Public play areas (playgrounds, (sport)fields, squares, etc.)
- Woonerven (15 km/h areas)
- Sidewalks
- Cycling paths
- Division between sidewalk, cycling path and/or car lanes
- Pedestrian crossings
- Children being visible for their surroundings
- The absence of roads with a speed limit over 30 km/h
- Other, namely: (fill in your answer below)

Other, namely:

Click on the grey area below to go to the map.

Places with a positive influence



Click here to continue. By creating a rectangle, you can indicate which places increase the independent mobility of your child. It is possible to create multiple rectangles by clicking this

Why is/are the indicated place(s) a positive influence?

This is an obstruction for the allowed independent mobility of my child:

- The absence of public play areas (playgrounds, (sport)fields, squares, etc.)
- The absence of woonerven (15 km/h areas)
- The absence of sidewalks
- The absence of cycling paths
- The absence of a division between sidewalk, cycling path and/or car lanes
- The absence of pedestrian crossings
- Children not being visible for their surroundings
- Roads with a speed limit over 30 km/h
- Other, namely: (fill in your answer below)

Other, namely:

Click on the grey area below to go to the map.

Dangerous place in the neighborhood



Click here to continue. By creating a rectangle, you can indicate what the dangerous places in the neighborhood are. It is possible to create multiple rectangles by clicking this question again.

Why is/are the indicated place(s) a dangerous?

What would you change in the neighborhood to allow your child to go further from home?

Appendix 2: Flyer

Gezocht!

Ouders met kinderen tussen de 5 en 12 jaar

Ik ben Mathijs en ik volg de studie Spatial Planning & Design aan de Rijksuniversiteit Groningen. Voor mijn bachelorscriptie ben ik opzoek naar ouders met kinderen tussen de 5 en 12 jaar.

Met behulp van een enquête doe ik onderzoek naar hoe ouders in de Oosterparkwijk en in Beijum, de wijk ervaren en hoe dat invloed heeft op de vrijheid die zij hun kinderen geven in de wijk.

Heeft u vragen, mail dan naar m.mulder.23@student.rug.nl



Helpt u mij met mijn onderzoek door de enquête in te vullen?

Scan de QR-code of ga naar <https://app.maptionnaire.com/nl/8266/>



Appendix 3: Survey response (multiple choice)

My child is in the age group	Count	%
5-6 years old	6	16,67
7-8 years old	5	13,89
9-10 years old	15	41,67
11-12 years old	8	22,22
I prefer not to say	2	5,56
	36	100

My child is a	Count	%
Boy	21	60,00
Girl	12	34,29
I prefer not to say	2	5,71
	35	100

Neighborhood	Count	%
Beijum	20	57,14
Oosterparkwijk	13	37,14
Unspecified	2	5,71
	35	100

My child is allowed to go into the neighborhood without my supervision.	Count	%
Agree	14	40,00
Partially agree	12	34,29
Neutral	2	5,71
Partially disagree	5	14,29
Disagree	2	5,71
	35	100

I think it is important to state to which distance my child can go from home, if he/she is going outside independently.	Count	%
Agree	21	61,76
Partially agree	11	32,35
Neutral	1	2,94
Partially disagree	0	0,00
Disagree	1	2,94
	34	100

I find it important to state to which distance my child can go from home, if he/she is going outside independently.	Count	%
Agree	20	60,61
Partially agree	10	30,30
Neutral	1	3,03
Partially disagree	2	6,06
Disagree	0	0,00
	33	100

The environment is safe enough for my child to move through the neighborhood independently.	Count	%
Agree	8	24,24
Partially agree	13	39,39
Neutral	1	3,03
Partially disagree	3	9,09
Agree	8	24,24
	33	100

I'm afraid my child will end up in dangerous traffic situations.	Count	%
Agree	2	8,33
Partially agree	11	45,83
Neutral	5	20,83
Partially disagree	4	16,67
Disagree	2	8,33
	24	100

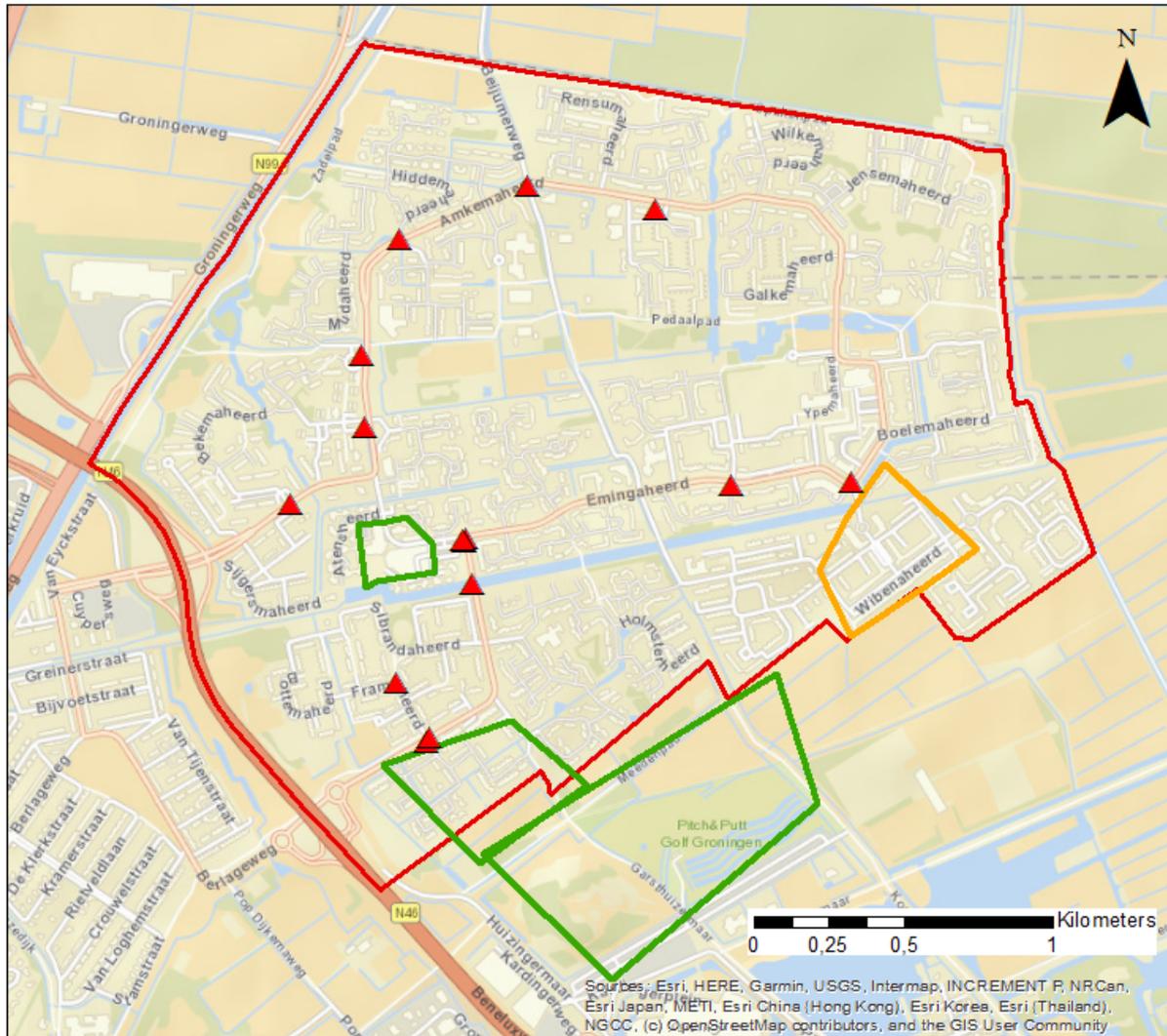
This is a positive influence on the allowed independent mobility of my child:	Count	%
Public play areas (playgrounds, (sport)fields, squares, etc.)	15	16,48
“Woonerven” (15 km/h areas)	14	15,38
Sidewalks	11	12,09
Cycling paths	6	6,59
Division between sidewalk, cycling path and/or car lanes	9	9,89
Pedestrian crossings	10	10,99
Children being visible for their surroundings	15	16,48
The absence of roads with a speed limit over 30 km/h	7	7,69
Other, namely: (fill in your answer below)	4	4,40
	91	100

This is an obstruction for the allowed independent mobility of my child:	Count	%
The absence of public play areas (playgrounds, (sport)fields, squares, etc.)	5	8,47
The absence of “woonerven” (15 km/h areas)	6	10,17
The absence of sidewalks	5	8,47
The absence of cycling paths	3	5,08
The absence of a division between sidewalk, cycling path and/or car lanes	7	11,86
The absence of pedestrian crossings	8	13,56
Children not being visible for their surroundings	12	20,34
Roads with a speed limit over 30 km/h	10	16,95
Other, namely: (fill in your answer below)	3	5,08
	59	100

Appendix 4: Maptionnaire maps

A4.1: Beijum

Influences on allowed independent mobility in Beijum

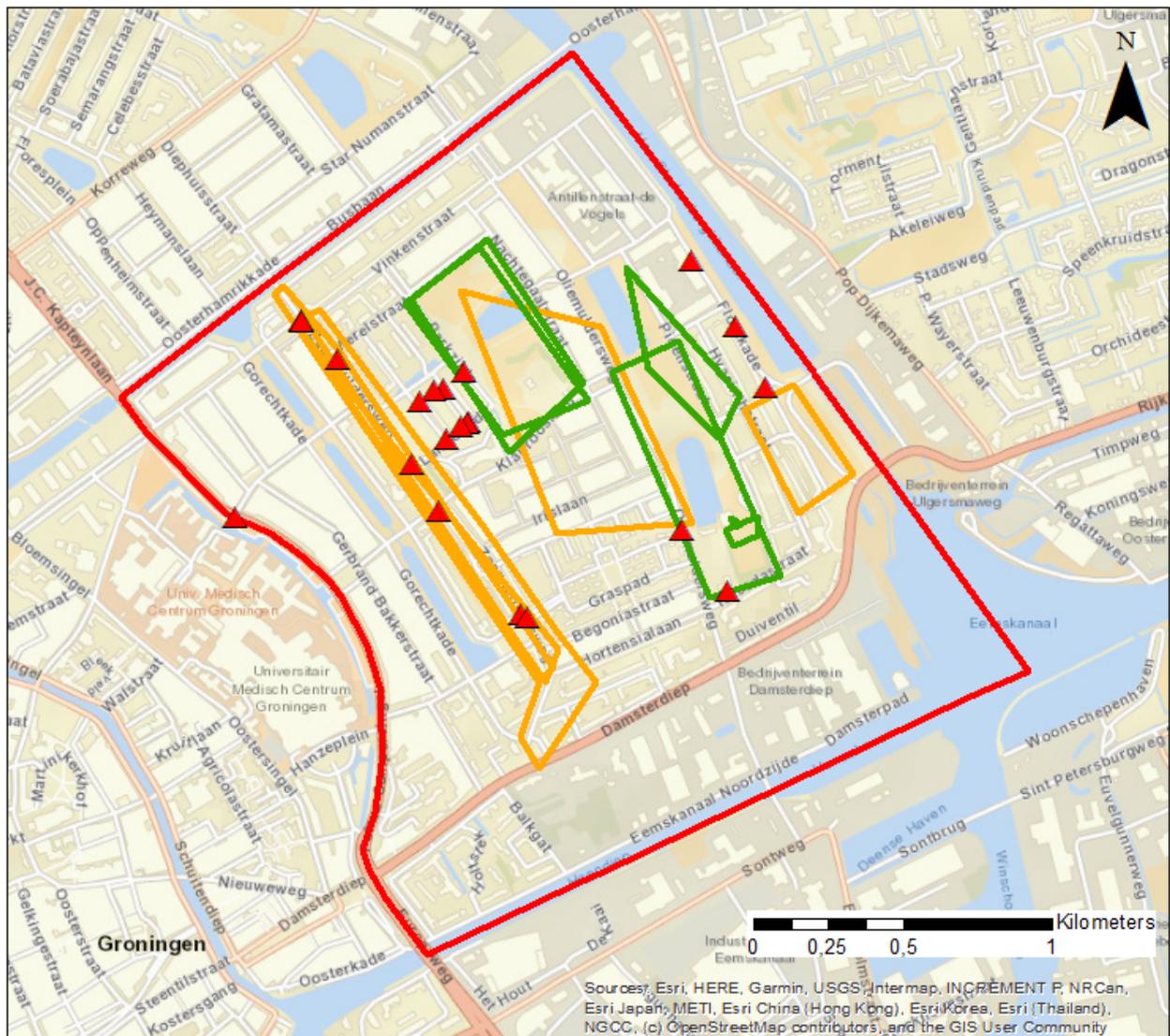


Legend

- Beijum
- ▲ Dangerous traffic situations
- Positive influence
- Areas of danger

A4.2 Oosterparkwijk

Influences on allowed independent mobility in the Oosterparkwijk



Legend

- Oosterparkwijk
- ▲ Dangerous traffic situations
- Positive influence
- Areas of danger