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MSc Programme in Urban Management and Development

Rotterdam, The Netherlands

September 2017

Thesis

Title: **Children Domain in the Public Realm**

An assessment of child-friendly city through subjective wellbeing in Rotterdam

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UMD 13

MASTER'S PROGRAMME IN URBAN MANAGEMENT AND DEVELOPMENT

(October 2016 – September 2017)

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UMD 13 Report number: 1049
Rotterdam, September 2017

Summary

This research aim to foresee the relationship between children domain in the public realm and subjective wellbeing in Rotterdam. Children domain in the public realm can be defined as children destination in the public space as the core elements of the neighborhood planning. Based on the theoretical background, the children domain in the public realm comprises of the school domain, the route domain, and the public amenities domain. Subjective wellbeing derived by questioning individual how satisfy are you as whole. Currently, the subjective wellbeing is commonly used as a tool to see social progress of a neighborhood, a city, and a nation. The research is deductive thus it is expected that the outcome can be generalized. It employs a mix method strategy in which an existing quantitative data analysis, spatial analysis and primary qualitative data analysis are able to perform triangulation to elevate the reliability and validity of the research.

The findings from a series of cross sectional inferential analysis show that there is significant relationship between children domain in the public realm and subjective wellbeing. The relationship can be found in two ways. First, a direct relationship without any intermediary and second, an indirect relationship through the mediation of domain satisfaction. It can be explained in the three children domains in the public realm.

First, in the school domain, the availability and accessibility of the primary school within walking distance or <500m significantly influence the subjective wellbeing - life satisfaction in positive direction indirectly through the mediating variable, the school domain satisfaction. The school domain satisfaction including satisfaction of the residents on the availability of preschool, primary school, and secondary school.

Second, in the route domain, safety route regarding traffic safety, safety route regarding social safety and the availability of pedestrian pathway significantly affect the subjective wellbeing - life satisfaction in positive way, without any intermediary.

Third, in the public amenities domain, the availability and accessibility of park and playground within walking distance or <500m affects subjective wellbeing significantly in negative sign. The availability and accessibility of health care within walking distance or <500m also significantly affects subjective wellbeing in negative sign. The availability and accessibility of sport, culture, and recreation facilities within walking distance or <500m significantly influence subjective wellbeing - life satisfaction directly.

Moreover, other factors are elaborated to figure out why child-friendliness and subjective wellbeing differs among neighborhoods based on the findings from existing quantitative analysis, primary qualitative analysis conducted through an in depth interviews with the key actors, and literature study. Some indicators also recommended to elevate the child-friendliness of the city based on the findings in this research. Furthermore, the research comes out with policy recommendation in the field of child friendly city and subjective wellbeing, in which the local government may consider in prioritizing their program and plan.

Keywords

Children domain in the public domain, Child-friendly city, Subjective wellbeing, Life satisfaction, Child's Right Convention, Children wellbeing, Neighbourhood planning, Child oriented development

Acknowledgements

First, praise Allah the Most Merciful and the Most Compassionate for Her unconditional guidance through my life.

My gratitude to the Urban Competitiveness and Resilience team, lecturers and staff at Urban Management and Development 13, Institute for Housing and urban Studies at the Erasmus University.

My gratitude to my father, Drs. R Sudjoko and my mother, Dr. Uki Sudjoko Ratulangie, for their unlimited support, my family in Indonesia and in the Netherlands, my lovely Indonesian and multi-national friends at UMD13, the child's right experts and activists, my colleagues at ars86care foundation, and last but not least, the children of the world for they are the reason behind this research.

This research is dedicated to Gian Ratulangi Bhumindra and Ucca Ratulangi Widitha

Abbreviations

IHS	Institute for Housing and Urban Development
E-Hero	Erasmus Happiness Economics Research Organization (Gardner, Prugh, et al., 2016)

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Chapter 1: Introduction

1.1. Background

Families tend to choose the place to live not only because of the job and income opportunities but also the city amenities for the children to fulfil the need to live, work, and play (Insch and Florek, 2010). One of the effort to attract the people back to the city is to create a more child-friendly cities by providing amenities and facilities for the children for example in the city of Amsterdam and Rotterdam (Karsten, 2002) in the Netherlands, Freiburg in Germany (Coates G.J., 2013, Gardner, Prugh, et al., 2016), and Vancouver (van den Berg, 2017) in Canada. Parks and playgrounds for children as well as culture and recreation facilities are considered as part of important space production in the city. While the city safety is also necessary to provide a more child-friendly city, it is argued that a place's utilities have been seen as a measure of the attractiveness of a city to families' needs and aspirations, and yet affects the city's competitiveness (Rogerson, 1999). It is also coined that quantity and standard of amenities that make some places particularly attractive for families include both natural as well as the built environment (Ballas D., 2013). Moreover, competitiveness of cities reflects that not only the city capacities to engage the global capital but also and more importantly, the city's capability to attract family with children.

Furthermore, it is recognised that significant determinants of the city's competitive profile include the advantages of urban amenities that meet the needs of families and children as the residents (Glaeser, Kolko, et al., 2001). Although it is still questioned on what is the right prescription to create a city that attracts people and influence the subjective wellbeing of the people, previous research finds some factors considered important in people's current lives to enhance subjective wellbeing. Research shows that relationship with family, health, finance, housing, the standard of living, availability of work, crime, leisure activities, and condition at work, education, religion and spiritual life are factors that affect subjective wellbeing (Rogerson, 1999). Furthermore, the environment regarding pollution, rubbish, noise, safety, cleanliness also influence the wellbeing of the people. Moreover, it is also argued that the subjective wellbeing is influenced by the environment regarding the importance of place, park and public spaces, mixed-use city vibrant, and street life activities (Leyden, Goldberg, et al., 2011). Also, competitiveness of a city can also be measured on the city livability which is argued by Veenhoven as the degree to which a living environment suit it best to the people including families' and children's needs as observed in subjective wellbeing.

The concept of subjective wellbeing in the public policy has long been echoed by the Aristotle statement on politics whereby it should aim at producing *eudaimonia* or happiness of the people in term of purposeful life. Since the ancient time, subjective wellbeing is related to the good life as a fruit of moral virtue (Veenhoven, 1996). Furthermore, contrary to materialist value is that life satisfaction matters. This implies that subjective wellbeing measurement is more widely utilised to influence the decision maker to start producing policy that improves the wellbeing of its citizens to complete the national progress economically which is previously based mainly on Gross Development Product per capita. Moreover, as the research of subjective wellbeing is increasingly accepted as a proper measurement of progress in the social sphere and public policy, many governments adopt subjective wellbeing data and research as a guide to make public policy to improve sustainable development in a city (Helliwell, Layard, et al., 2015). A vast amount of literature is available on subjective wellbeing in world, nation, and city scales which has shown its reliability to assess the outcome of policy. It can strengthen the position of subjective wellbeing indicators to stand alongside with the economic indicators to evaluate national, regional, city, and neighbourhood progress. In short, the subjective

wellbeing research may be used to predict future utility by the decision makers (Frey and Stutzer, 2002). How does the research on subjective wellbeing in the neighbourhood level correlate with public amenities and facilities for the children?

Furthermore, the study of wellbeing with a focus on children, both objective and subjective, is also raised as the international interest in children and their social participation has increased (Casas, Sarriera, et al., 2012). The objective wellbeing may include registered amenities, facilities and services for children. The subjective wellbeing measures level of satisfaction regarding to the public amenities. There are global trends that accelerate research on wellbeing of the children, or defined by Ben-Arieh as the "child indicators movement", which include satisfaction to the amenities, facilities, and services provided in the neighbourhood. (Ben-Arieh, 2008). In today's world, approximately 30% of the world population of 7.4 billion (2016) is children below 18 years old, where 54% of the world population lives in the cities, has brought that research focus on children is necessary.

The position of a child in the world has been strengthening, since the establishment of the United Nations Child's Right Convention in more than two decades and has already become obligation under international law to cities and municipalities around the world nowadays. Child's Right Convention is known as the first legally binding international instrument that includes a holistic treaty for every child's right to the standard of living that conducive to physical, mental, spiritual, moral, and social development that stands as a global commitment. Beyond the international legal obligation to put children first in the interests of all the stakeholders in the city, there some reason why children position in the city is essential. Firstly, children are individual people with equal status to adults. Secondly, children's health development and active participation are uniquely crucial to a healthy future of any city. Thirdly, children grow up only with the help of adults. Fourth, children are more affected by the conditions where they live. Also, finally, it is important to avoid a huge cost to society in the absence of intervention on what happens to children in the early years, within the family or within another form of care, which is significantly determined their positive or negative development. Thus, in the long run, the wellbeing of the children will determine the children cost or contribution back to the society over the rest of their lives (Riggio, 2002).

Currently, almost all countries in the world have ratified the Child's Right Convention that includes forty-four articles addressing almost every aspect of children's lives. The position of children has been stressed in the United Nations Conference on Human Settlement Habitat II that the children wellbeing are a significant indicator of a healthy society and that child-friendly cities are also cities that fit for all age groups. Following the Convention, many cities have adopted and built policies on child-friendly city. In developed nations, priorities have been given in response to children's need for free movement or independent mobility, and recreational activities, green spaces, and road safety, to reorganisation of more friendly cities to children by redesigning spaces from the point of view of the children. Moreover, the world's leaders have adopted the New Urban Agenda from the United Nation Conference on Human Settlement Habitat III, which sets a new global standard for urban development for building cities that can serve as engines of prosperity, centre of cultural, and social well-being while protecting the environment.

Child Friendly City frameworks have been developed to ensure that the city governments are constantly synchronised with the best interests of children and that cities are places where children's right to healthy, caring, protective, educative, stimulating, non-discriminating, inclusive, culturally rich environment are addressed. The initiative's purpose is to develop the child's full potential. The Child's Right provision in the cities covers child's right to health, education, protection from all form of violence, children deprived of family environment,

access to appropriate information, and moreover, adequate standard of living (Hodgkin, R. and Newel, P., 2007).

1.2. Statement of Problem

The function of a city can be defined as to caring and nurture of human beings and of the earth according to Lewis Mumford (Ward, 1978) . Nurturing the human being can be started from one of the most vulnerable population group in the city, the children (Kamerman, Phipps, et al., 2009). Unfortunately, their presence is hardly seen by the decision maker and the urban planner. Furthermore, the urban context of where families and children live can be described as deteriorating especially in the public domain (Karsten, 1995). Urban traffic and car parking have transformed the character of the inner city and brought the negative effect on children's freedom of movement. In addition, with the increase of social safety problems, public green spaces may function as a forbidden area for children. Also, it is addressed as a relatively ignored, rapidly growing, and highly vulnerable population in the city. Children domain in the city can be seen as islands that are scattered everywhere in the city, bordered by streets that limit the movement of the children. Although some examples underline the fact that children create their own play object if you give them space, most of the time leftover areas that are not part of the urban planning of a city become children's spaces in the city. More problems arise as children spend more time in childcare with parents in longer working hours, while at home children are kept inside because of fear about the stranger's danger. Moreover, the shrinking children's domain in the city is a side effect of wider social changes (Gill, 2008) and the economic changes.

Furthermore, in the article entitled Planning Cities with Children in Mind, Roger Hart asserts the issues of how cities develop has distinct and serious implications for children. Children's healthy development and active participation are uniquely crucial to the healthy future of any city or society. Although the children participation is not the core of this research, the provided children domain in the neighbourhood may give opportunity to the children development with their active participation. On the other hand, the particular needs of children are rarely given the priority by those who plan and manage the city except for school and sometime recreations. Child-friendliness of city highlight the opportunity to stimulate the children evolving process that is provided by a city (Karsten, 1995). In addition, a normative dimensions of a child-friendliness of a city has been developed in an array of children domains ranging from housing and dwelling, basic services provision, children participation, safety and security in public transport and public space. Also, family and community social relationship, urban and environment quality, provision and distribution of resources, the protection of nature, sense of belonging to a certain culture, and a good governance that takes children into account in decision making (Nordström, 2010).

A UNICEF overview in 2007 of child wellbeing in 21 countries shows that countries whose children possess high rates of subjective wellbeing and also the best outcomes around family and peer relationship and behaviour risks including the Netherlands and Scandinavia countries. The findings show that school-age children in these countries have more self-directed activities, less obesity due to higher rates of walking and cycling (Gill, 2008). Furthermore, in a recent study, UNICEF office of research Innocenti in 2013, the Netherlands is rated as having the happiest children in the world according to research on child wellbeing in rich countries.

The city of Rotterdam has adopted child-friendly city policy more than a decade ago (van den Berg, 2017). At that time, a national research tool in 2010 to estimate the wellbeing of Dutch children ("*Kinderen in Tel*") has shown that Rotterdam was the least favourable city in which to grow up. Since then various plans have been developed and many positive outcomes have been attained, aiming to improve safe traffic routes and safe play areas, improve facilities and

activities for children and youngsters, create attractive public spaces, build more child-friendly houses, and create a community spirit in the neighbourhood. Based on Rotterdam child-friendly monitor (van den Berg, 2017), a study conducted in eleven neighbourhoods in Rotterdam has shown that a focus on child-friendly development helps to attract families and keep families to live in the city. It is obvious that there is something good to be shared from the child friendliness of the city of Rotterdam. To sum up, the children domains in the city will be investigated thoroughly in this research and how they affect the subjective wellbeing of the resident, will also show how they may attract families with children.

Furthermore, this thesis will address what makes child-friendliness among neighbourhoods in the Rotterdam differ and to what extent the child-friendliness of the neighbourhood influence the subjective wellbeing of its residence including adults and the children. In the advanced industrialist societies, post-materialist values such as subjective wellbeing is placed in higher priorities. Hence, subjective measurement becomes as equally as objective measurements of social realities (Abramson and Inglehart, 1995). When measurement on satisfaction matters, the best method to evaluate child-friendly city policy is by asking the city's users. Bearing in mind with the conviction that the research is useful, how the provision of children domain in the public realm as part of child-friendly city affects life satisfaction directly through subjective wellbeing measurement will be emphasized in this research.

1.3. Research Objectives

The research aims to examine to what extent the **children domain in the public realm** influences **subjective wellbeing (domain satisfaction and life satisfaction)** in Rotterdam as an assessment of the child-friendly city policy. It is also an attempt to find what determines this relationship and furthermore to build recommendation on child-friendly city policy to the policy maker.

1.4. Research Questions

Main research question:

How does the provision of children domain in the public realm affect the subjective wellbeing in Rotterdam?

Sub research questions:

- What are the indicators of child friendliness of a city that contribute to subjective wellbeing of the people?
- What are the implication of child friendliness of a city on child friendly city policy?

1.5. Significance of the study

Many research has been conducted on child development, health, and wellbeing. Study on child mental health and behaviour are also significant in numbers (Casas, Sarriera, et al., 2012). The position of a child in the city has been approached in a more limited way in respect of public health that pinpoints on the risk of traffic and abduction by strangers and physical inactivity, or in another word the studies are limited to children with particular health problems (Casas, Sarriera, et al., 2012). In a more comprehensive framework, it is argued that a child-friendly city provides policies and practices that focus on children's right to public space and highlights the wellbeing of the children in the city (Whitzman C., Mizrachi D., et al., 2010). There is also currently a vast research to subjective wellbeing currently as an attempt to measure the rate of satisfaction of the people to their health, income, and overall life. Numerous attempts to analyse subjective wellbeing from various disciplines have been increased also in terms of objective

factors, such as the quantity and quality of natural amenities and the built environment amenities (Ballas D., 2013). But there is no research on assessing children domain in the public realm based on the Child's Right Convention and to what extent it affects the people satisfaction. This research aims to address this gap by investigating the children domain in the public realm and it's relation to subjective wellbeing of the people.

Research in the past twenty years responses on the decreasing abilities of children to explore their urban environments independently through walking, cycling, and using public transport where the main barriers include parental perceptions of traffic safety and the stranger's danger (Gill, 2008). Furthermore, the decrease in children's physical activities in the city and the deterioration of the social cohesion can also be related to the children's time spent daily dominantly in the backseat of the car (Karen Malone, 2002). Moreover, decreasing children's independent mobility studies have become a successful thought provoking to the policy maker to create a more child oriented development in the city. However, the extent to which research on how children domains in the city are taken into account as an element of urban planning is still limited, and research on this thesis is addressing to it.

The research also aims to examine to what extent the children domains in the public realm influence satisfaction of the people, the users of the city and yet influence their subjective wellbeing. The geographic focus is the city of Rotterdam, where child-friendly city initiatives are amongst the fast growing number of the cities in the Netherland. How do child-friendly city policies and practices support physical transformations of a city, not only towards a goal of more children's playgrounds and parks, more walking and cycling by children but towards a more comprehensive framework of children's right to the city, in this research, especially in the public realm. Objective research has been done to assess the outcome of the policy, for example on the provision of free education, accessible health care and other forms of care, play and leisure amenities as part of the whole child-friendly city framework. The significance of the research is to focus on assessing the outcome of child-friendly city policy by examining subjective wellbeing of the resident, or in other words, by asking directly to the users of the city.

1.6. Scope and limitation

As the heart of child's right convention, the city utilizes as a place for children to grow up implying that the city provides an opportunity for children's evolving capacities. Furthermore its public realm should be able to stimulate the children's active participation in creating their spaces (Karsten, 1995). It is argued that public space accessibility to children is vital. In the children domain outside from home which local government and the community may intervene, including schools, childcare, parks, playgrounds, community centres, sports and recreation centres, shopping centres, public libraries, museums, streets, bicycle lanes, pedestrian pathways. These all count as the sites creating the public realm where all children inclusively may access (Hayward, 2012).

Research on sustainable neighbourhood also pinpoints the attractiveness of public realm and its maintenance along with other factors are a significant contribution to subjective wellbeing. The World of Happiness report shows that countries where their cities contain strong social interaction can sustain or even improve their subjective wellbeing although facing disturbances such as natural disaster or economic shocks for instances. Findings also show that social connectedness and place connectedness or in other words an aspect of city planning and maintenance of the public realm are also associated with subjective wellbeing universally (Leyden, Goldberg, et al., 2011).

The concept of child-friendliness of a city is complex, multidimensional and multilevel (Nordström, 2010). What the children needs in a city range from a secure and adequate housing, an equitable and inclusive city, a healthy city, a safe and accessible city, a caring city, a playful city, a city for learning, up to a green city (Hart and UNICEF., 1996). Addressing child friendliness of a city as a child's right fulfilment may face multi-layers of issues on children and comprehensive indicators. However, due to the important role of the public realm to provide equality and inclusiveness in public space, the scope taken on this research is the **children domain in the public realm,** as part of quality of place or place-related attributes, which hypothetically, along with other domain satisfaction, affects subjective wellbeing positively (Marans and Stimson, 2011). Moreover, bearing in mind that the city fits for children is the city fits for all (Riggio, 2002), the research in this thesis addresses **the people subjective wellbeing** as the decision maker in the family to choose the place to live, without diminishing the importance of children's subjective wellbeing respectively. Also, this research focuses at the city level, by investigating data at the neighbourhood level since recent interest on neighbourhood based-planning is recognised as the most viable units of actions (Martin, 2003, Park and Rogers, 2015).

Chapter 2: Literature Review / Theory

2.1. Children domain in the public realm

2.1.1. Child friendly city and the city response

Child-friendly city idea has been started by Kevin Lynch research on the children perception to their living environment conducted in four cities, Melbourne, Warsaw, Salta, and Mexico-city in the year of 1971 – 1975 (Lynch, K., 1977). Under the signature of a Growing Up in Cities (GUIC) supported by the UNESCO, this research purpose is to compile the children priorities as a guidance to enhance the children participation and the city development that fit for children. In the 1989, the United Nations has adopted the Child's Right Convention. Following the convention, in 1992, the world leaders in the United Nations Conferences on Environment and Development in Rio de Janeiro have agreed with the Agenda 21 principle to sustainable development in which the children and youth involvement in the society's activities for the environment is encouraged as stated in chapter 25. Moreover, Kevin Lynch's research has been reviewed by Dr. Lousie Chawla from the Children and Environment Program of the Norway Center for Child Research in 1994-1995. Supported by UNESCO and Child Watch International, the research has been taken in six cities including Buenos Aires, Salta, Melbourne, Northampton, Bangalore, and Oaklands (Chawla, 2002). Moreover, the findings have been adopted by UNICEF as indicators to monitor the Child's Right fulfilment around the world. Furthermore, in 1996, local governments from all over the world have met and agreed to create a more sustainable dwelling in the City Summit at the Habitat II Conference in Istanbul. As stated in Habitat Agenda opening, paragraph 13, it is emphasized that children and youth should have a child-friendly environment, involved in the decision maker in the community and in the city, fulfilled their needs, participate, and their right to play in their neighbourhood. Based on this City Summit, the UNICEF and UN Habitat introduce the Child-friendly city Initiative which also includes the children who untouched by basic services and protection to ensure their Child's Right fulfilment. Furthermore, in the UN Special Session on Children, May 2002, local governments from around the world have committed to actively promote the Child's Right, and recommend: (1) Child-Friendly City development to fulfil the Child's Right and protection, (2) to promote the children participation in the decision process in the city development and the city policy. To sum up, the UNICEF, the UN Habitat and national governments around the world continually promote to increase the local governments' capacities to bring a child-friendly city issues in their policy and their city development (Widowati, Patilima, et al., 2014).

A child-friendly city has been developed by placing the best interests of children as the core in the city government decision to consistently create a city where children's rights to a healthy, caring, protective, educative, stimulating, inclusive, and culturally rich environment are covered (Hart, Wridt, et al., 2011). A research by UNICEF Innocenti Research Centre, the International Secretariat for Child Friendly Cities, states that child-friendly city provides a framework to the full implementation of the United Nation Child's Right Convention that falls to the city government to create goals and actions for the children at the family, neighbourhood, and the city scales (Riggio, 2002).

The foundation of child friendly city development including non-discrimination (Article 2), the best interests of the children (Article 3), the right of every child to life and maximum development (Article 6), and to listen to and respect the children view (Article 12). The four principles of building a child friendly city demand inclusiveness of children regardless of their abilities, ethnic minority or another group. It can be seen as an attempt to put children first in

the city government actions that need awareness and sensitivities of all level of government. Also, it seeks the optimal childhood development's condition provision, and moreover, to engage the children's participation in their families, their schools, and their neighbourhood (Riggio, 2002). A question arises on how do decision-makers respond to the concept of child friendly city in public policy?

The first attempt is laissez-faire response which sees parents and families responsibility for the children's wellbeing. Public services including education, health and welfare become the city government's responsibility. The role of children to actively transform their lives is seen as neutral in child friendly city's assessment (Gill, 2008). On the other hand, there is a more interventionist policy to improve children's wellbeing which sees the adult support as the main determinant on the children's wellbeing. This service-oriented response recognized targeted services when there is a need for extra help shown by the children. This kind of policy also pays attention to universal services. The drawback of service-oriented response to improve the children wellbeing is the increasing demand for the services while it is not easy to measure the services' outcomes (Gill, 2008). Another decision maker response on child friendly city concept embraces direct and indirect interventions that aim to provide the opportunity for children to grow through their own experiences in the children domains. The interventions are aimed not only to the children at risk but also to all children inclusively. This space oriented response (Gill, 2008) views children as active and creative actors rather than part of society in demand for services. The research on this thesis sees the importance of the provision the children domain to stimulate child development in the city.

2.1.2. Children domain in the public realm

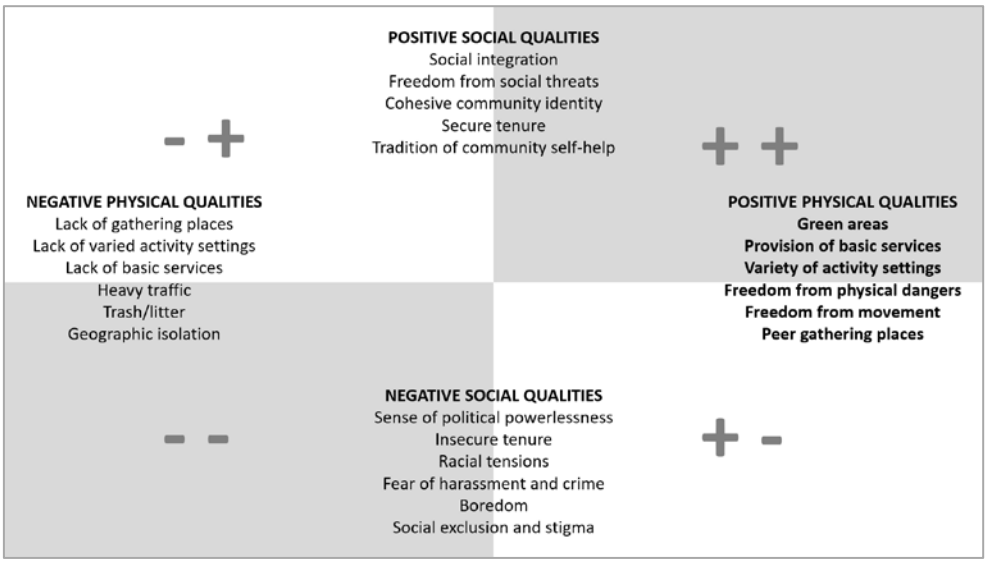
The term of the public realm is used to address the cultural and political concern which is used differently and occurs at various scales from small scale street, pedestrian pathway and park to even the digital world as concerned by the urban geographer in the context of the right of individuals or groups in the civil society. While scholars in architecture and planning define public realm as physical space for everyone and its relation with the people, urban sociologists are more concerned with the use of public space for social dynamics. The public realm almost offers no barrier and welcomes everyone regardless of monthly income, ethnic background or ideological boundaries. It also provides accessibility as well as physical visibility (Hampton, Livio, et al., 2010). The public realm in the city contains many functions, not only by providing meeting places but also helping to define the built environment, offering various spaces to invite people to express themselves, play and exercise (Gehl, 2010). However, it is agreeable that public space can be seen as a physical manifestation of the public realm where it is agreed that public space plays important role in sustaining the public realm (Mehta, 2014). Public spaces including streets, pedestrian pathways, sidewalks, bicycle lanes, parks, playgrounds, public libraries, museums, community centres, squares, Plaza, Waterfront, and markets are characterised by public ownership and accessible to everyone without exception (Toolis, 2017). On the other side, public space nowadays is seen as shrinking through the creation of consumption spaces and privatisation. Although it may seem to be ambiguous, two main understandings of public space is the ownership, including public ownership and private ownership and access (Johnson and Glover, 2013). To clarify, this research excludes commercial public space as the subject to be studied since it belongs to private enterprises. Bearing in mind that the heart of child-friendly city is to provide stimuli on children development in the city, in this research, children domain in public space will be investigated as the child's right implication in the spatial development of the city.

According to Peter Moss and Pat Petrie in their book From Children's Services to Children's Spaces, the child-friendly domain can be defined as "the physical, social, cultural, and

discursive spaces where children and adults might contest understandings, values, practices and knowledge." There are some attempts to map children domains in the city in a more physical setting; first, three daily living children domain (Karsten, 2002) including play spaces, leisure clubs, and childcare facilities. Moreover, the concept of negotiated 'home range' also initiated to understand where children, of different gender, go throughout the neighbourhood (Ward, 1978, Woolley, 2008).

Another children domain mapping is done by distance from home. Based on the time available for play activities, three ranges of children destination for play activities are pinpointed. Firstly, the innermost zone around the home is known as habitual range, which is used for short periods on a daily basis. Secondly, the intermediate range is used in longer duration of time. Third, the occasional range is used only on a special trip (Moore, 1986). Another view on children domain is based on the need to gain parental consent. Some physical factors define the range including topography, visibility, and the dangerous feature's presence. According to Hart, first, the free range is the area where children go without adult permission. Second, the intermediate zone is the range where the adult permission is necessary. Third, the outermost zone that can be defined as the area where children should negotiate the time, the location, and the activities with parents or the caregiver (Hart, 1979). However, it is agreed that age becomes the control variable that determines the changes in the range's boundary, the type of activities, as well as the time duration.

Figure 1: Indicators of the environmental quality from the children's perspectives based on the evaluations of 10-15 year olds at "Growing up in an Urbanizing World"



Source: Chawla (2002)

Other strong arguments to determine the children domains have been forged through a larger context of debates about public participation in planning, specifically on children participation, since almost 50 years ago. Kevin Lynch, a humanistic professor of urban design and planning, puts forward questions about how urban forms contributes to human development. Lynch projects, Growing Up in the Cities, supported by the UNESCO in the 1970s which then followed by Chawla's Growing Up in an Urbanizing World in the 1990s have coined the child-based indicators of environmental quality. The positive physical qualities indicators range from social integration, peer gathering places, a variety of activity settings, safety and freedom of movement, a cohesive cultural identity, to green areas. On the other hand, from the perspective of the children, it is argued that there are also indicators of an alienating place, including social

exclusion, boredom, fear of harassment and crime, racial tensions, lack of basic services, too much traffic, uncollected trash and litter, a sense of political powerlessness, geographic isolation, in term of physical indicators. Figure 1 shows the positive and negative indicators of the environmental and social qualities from the children views (Chawla, 2002).

Moreover, there is also an attempt to categorize the children domains that covers the children's presence in the city, though not only the children play destination. It comes up with four important environments including a child's home, the school, the route between the home and the school, and the neighbourhood surrounding the home and the school (Loon and Frank, 2011). This model is characterized in term of the domain's potential to influence physical activity of the children. It comprises of the child's origin, the destination, and the network in between. This concept is the chosen children's domain characteristic to determine a more detailed children's domain in the public space, in regard to the child's right fulfilment in this research. Figure 4 shows the implication of child's right fulfilment on children domain in the city that determines spatial intervention to the city development. Without any attempt to diminish the important role of the home to stimulate children development, this research examines children domain in public spaces which include the school, the route between the home and the school, and the neighbourhood surrounding the home and the school.

Table 1: The child's right spatial implication on the children domain in the public realm of a city

Child's Right Convention articles that has spatial implication on children domain in the public realm		Children domain in the public realm		
		School domain	Route domain	Public amenities domain
article 9	Child's right to be taken care of when not under parent's supervision	-	-	Child care Orphanage Temporary shelter
article 17	Child's access to appropriate information	-	-	Library Community center Cultural and recreational facilities
article 24	Child's right to health	-	-	Green open space Clinic Hospital
article 27	Child's right to an adequate standard of living	-	Safe route to school Pedestrian pathway Bike lane Public transport hub	-
article 28	Child's right to education	Preschool Primary school Secondary school	-	Community center for vocational study
article 31	Child's right to leisure, play, and culture	School playground	-	Play space near home Waterfront Park/Green open space Playground Community center Sport, cultural and recreational facilities

Source: Author, 2017

The articles of Child's Right Convention that have spatial implication to the public realm to be provided in the Child Friendly City includes: articles 9, 17, 23, 24, 25, 27, 28, and 31. They can be categorized in three children domains in the Public Realm including first, the school domain, second the route domain or the route between home to school and the public amenities for children, and third the public amenities for children domain. The matrix between articles of the Child's Right Convention that have spatial implication to the city and the children domains in the public realm can be seen in table 1.

First, article 9, about the separation from parent, comprises that the child's right not to be separated from parent except when necessary for the best interests of the child. This includes children in state care, children living and/or working on the streets, children in hospitals, parents in prisons, child offenders, parents working abroad, immigration and deportation, armed conflict, traditions or customs, decision-making about separation. They are to be taken by competent authorities, to be subject to judicial review, to be in accordance with domestic law. The spatial implication on the article 9 may include child care which can be categorized in the public amenities for children domain.

Article 17 about child's access to appropriate information contains the function of mass media, the committee's Day of General Discussion on the media, information from diversity of sources, social and cultural benefits from media, children's books, linguistic needs of minorities, guidelines for protection from injurious information, and privacy and the media. The spatial implication on the article 17 may include public library, museum, and the urban farm which can be categorized in the public amenities for children domain, under the cultural and recreational facilities.

Article 24 about child's right to health and health services that may support in reducing infant and child mortality, necessary assistance and health care, combating disease and malnutrition, appropriate care for mothers, provide health education and support for breastfeeding, accident prevention, HIV/AIDS and provide preventive health care such as immunization, family planning, adolescent health services, and mental health. The spatial implication on the article 24 may include clinic for children and can be categorized in the public amenities for children domain.

Article 25 is about child's right to periodic review of treatment that includes placements for care, protection or treatment, and periodic review related with the children health. The spatial implication on the article 25 may include clinic and hospital facilities for children and can be categorized in the public amenities for children domain.

Article 27 about child's right to an adequate standard of living for physical, mental, spiritual, moral and social development, which is also related with the provision of safe route to school, safety on the road, pedestrian pathway, bike lane, and public transport hub.

Article 28 about child's right to education that include education system fit for children, education rights to be achieved progressively. The education should become the basis of equal opportunity for girls, rural children, minority groups, children with disabilities and children with or affected by HIV/AIDS, and children in forms of detention. It comprises compulsory and free primary education, development of different forms of secondary education available to all, higher education available to all on basis of capacity, vocational information available to all. The spatial implication on the article 28 may include preschool, kindergarten, primary school, secondary school, high school and can be categorized in the school domain. Another spatial implication on the article 28 includes community centres as a media to provide optional vocational education that can be categorized in the public amenities for children domain.

Article 31 is about child's right to leisure, play and culture that includes child's right to rest and leisure, child's right to play and recreation, child's right to participate in cultural and artistic life. The spatial implication on the article 31 may include park and play grounds including the school's playground, play space near home, and sport, culture, and recreation facilities in the city.

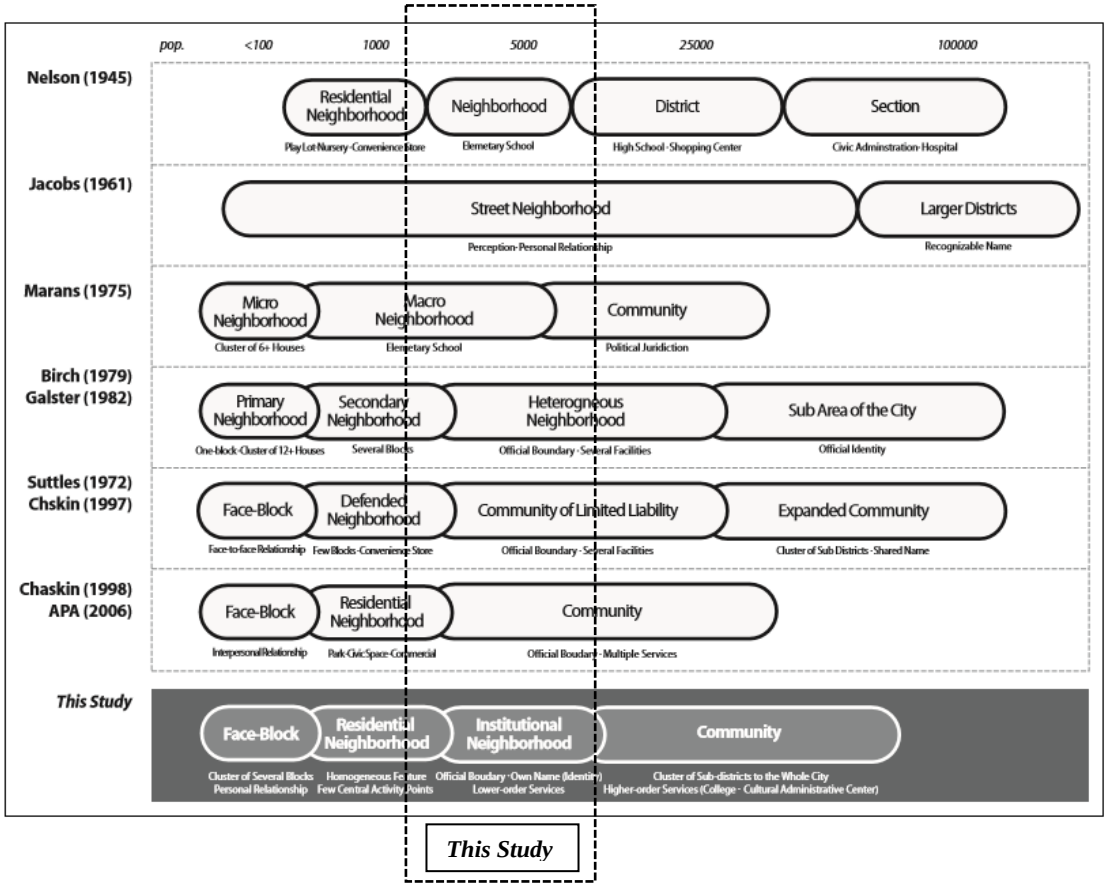
To sum up, as an attempt to promote the Child's Right fulfilment in the city, this research adopts the spatial implication of the Child's Right Convention on the children domain in the public realm that includes the provision of first, preschool, primary school, and secondary

school in the school domain. Second, the provision of the pedestrian pathway, bicycle lane, street, and public transportation in the route domain Third, the provision of the neighbourhood surroundings the home and the school including the park, playground, sport arenas and theatre or community centre for culture performance in the public amenities for children domain.

2.1.3 Neighbourhood planning theory and children domain in the public realm

There is a vast amount of literature on neighbourhood studies and recently, neighbourhood becomes the most viable units of actions in planning. The advantages of neighbourhood-based planning is a more responsive to local capacity and effectively engage the residents' active involvement (Park and Rogers, 2015). A brief review of the neighbourhood in the planning theory, planning guidelines and empirical research is explored in term of the requirement of size, population, boundaries, and especially available facilities can be seen in figure 2.

Figure 2: Comparing relative levels of neighbourhoods



Source: Park (2014) modified by author, 2017

The diagram shows relative positions and population of each neighbourhood based on the scholarly description. This study uses the diagram on far below on figure 2, the four possible levels of classification based on physical characteristics include size, local facilities, and recognised boundaries. It is based on the composition of socioeconomic features including homogeneity or heterogeneity of income, life cycle, ethnicity, and also the degree of an informal network (Park and Rogers, 2015). First, a face block is the smallest unit of a neighbourhood that refers to a cluster of several houses, but not appropriate for physical planning. Second, a residential neighbourhood comprises of several face blocks, designed primarily as a residential area and contains a central point such as elementary school or small retail stores. Third, an institutional neighbourhood contains several residential neighbourhoods

and includes a range of public amenities such as schools, health centres or clinic, recreational and social facilities, and shopping centre. Fourth, community or a cluster of districts that cover an area that are likely to have a cultural centre, administrative centre, colleges to serve larger population (Park and Rogers, 2015). However, this thesis addresses the institutional neighbourhoods including the core elements of the neighbourhood including the public schools, and the public amenities connected by route from home or street as the most important elements in a city's public realm. The route domain in the form of pedestrian pathways, bicycle lane, street, and access to public transport can be seen as the network of spaces and corners where public in this case children are free to move, to meet friends, to play and gather, and simply to watch one another (Montgomery, 2007). Moreover, the presence of public amenities is measured physically on their availability and accessibility based on their necessity in the neighbourhood planning (Hayward and Weitzer, 1984, Giles-Corti B, Broomhall MH, et al., 2005, Haugen, Holm, et al., 2012). Availability can be defined as the presence and the distribution of public amenities in the neighbourhood scale. Accessibility can also be viewed as proximity from residential to schools and to public amenities. However, the affordability as well as the quality of the public amenities may also become two attributes to complement the research, but in this thesis the availability and accessibility are chosen because of their essential attributes in the neighbourhood planning (Coulton and Fischer, 2010).

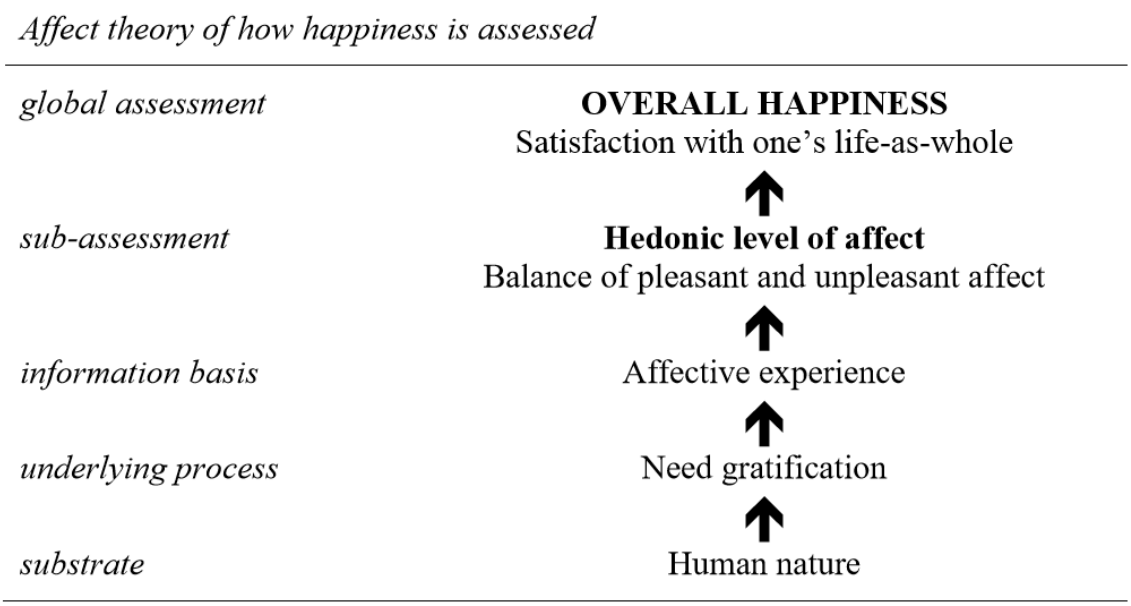
2.2. Subjective wellbeing study contextualized

2.2.1. The study of subjective wellbeing and its measurement

Subjective wellbeing can be defined as individual desires to have, live, exploit, enjoy and harness most of the time. It is the nature of human beings to try to optimize their situation. Although its attainment may differ across culture, time, and space, wellbeing meets the basic needs of life and aim to respect human dignity. It leaves an individual to judge his or her feeling of one's life as a whole (Veenhoven, 2009, Diener, Napa-Scollon, et al., 2000). It is measured by the way one assesses one's life as a whole and all that goes with it and around it. It is a quantitative method using surveys by asking how to satisfy one's as a whole on a scale from 0 – 10 (Veenhoven, 1996).

There is a development in the conceptualization of satisfaction including, first, variants of satisfaction are distinguished. Satisfaction with life as a whole differs to satisfaction with life domain such as satisfaction with work, satisfaction with the living condition, etc. Second, in term of the scope of the evaluation, satisfaction with life as a whole is distinguished from aspect satisfaction such as the satisfaction of life experience, satisfaction with the ease of life. Third, in terms of the way of appraisal, satisfaction is also distinct from affective satisfaction as seen in figure 3 the affect theory, and satisfaction by means of a standard of success or cognitive evaluations (Veenhoven, 1996). Furthermore, to some extent, when a variant of satisfaction is distinguished between life satisfaction and domain satisfaction, the former may describe a person's innate disposition while the latter may define actual experiences (Diener, Napa-Scollon, et al., 2000). Moreover, the domain satisfaction may respond to experience and the specific aspect that also influences the subjective wellbeing (Diener, Napa-Scollon, et al., 2000). In this thesis, domain satisfaction is elaborated to satisfaction with the children domain in the public realm.

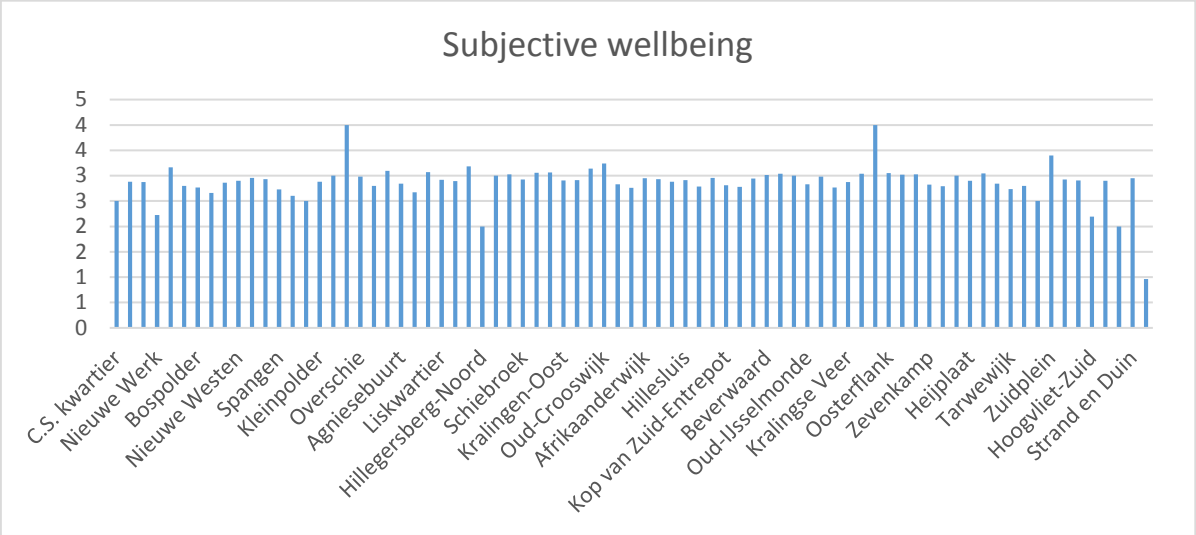
Figure 3: The Affect theory



Source: Veenhoven (2009)

Key variables that affect subjective wellbeing includes income and the role of changing aspirations in life-cycle (Easterlin, 2001). It is argued that inequality affects subjective wellbeing more significantly than levels of income (Ballas D., 2013). Another research shows that it is the employment status, the quality of interpersonal relationship (Frey and Stutzer, 2002), and health status (Dolan, Peasgood, et al., 2008) that affect subjective wellbeing. The question arises, do places affect subjective wellbeing? It is argued that there will be no place that would be optimal from subjective wellbeing perspective, since it may vary from person to person. Further explanation, the subjective wellbeing would be affected by the quality and proximity of school from home, quality housing, and public amenities offered for families in a city, whereas the children would like to see more of places to play (Ballas D., 2013). The research on this thesis aims to investigate the influence of children domain to the subjective wellbeing including domain satisfaction and life satisfaction as a whole, in the neighbourhood of Rotterdam city. Figure 4 shows the different levels of subjective wellbeing in the neighbourhoods of Rotterdam and reflects on the average scores of subjective wellbeing based on more than five thousand respondent when asking how satisfied are you as a whole from one to four scale. Furthermore, in this research, this empirical findings will be tested whether satisfaction to the children domain affects the life satisfaction of the residents of the Rotterdam city.

Figure 4: Subjective wellbeing in the neighbourhoods of the city of Rotterdam

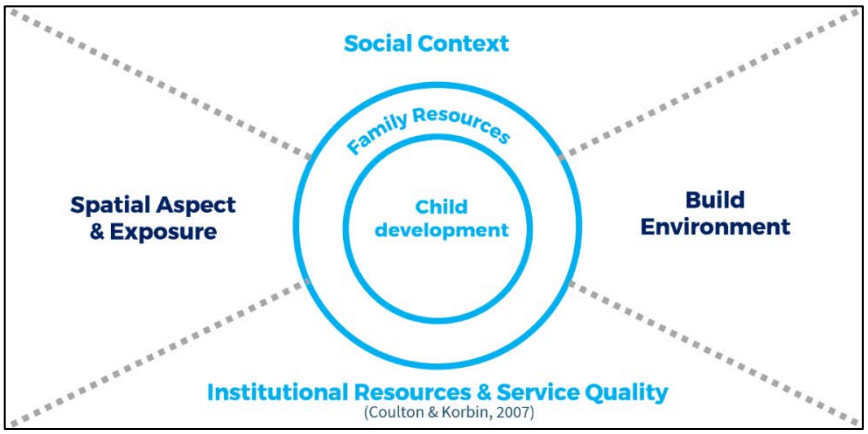


Source: Erasmus Happiness Economics Research Organization

2.2.2. The study of wellbeing focus in children

In search for the wellbeing indicators, the environment is recognized as the basis for child indicators to be included not only on children's health and development. As seen in figure 5, schematic children wellbeing place child with local indicator measuring school achievement, health status, and youth development (Coulton and Korbin, 2007).

Figure 5: Schematic Children Wellbeing



Source: (Coulton and Fischer, 2010)

Household and family surrounded the child are also measured as one indicator such as families involvement in the children development, family participation in the community, etc. Social context is also one sign of children's wellbeing which is measured by the level of community violence, crime rate, etc. Areas, where children live, can be measured by the degree to which they support healthy activities, walkability of the street, proximity to play area, as well as the quality of the park. It is also important to look for the indicators related to institutional and quality of services such as teacher-student ratio. Also, spatial locations can also map and measure the children distant to advantages or disadvantages resources (Coulton and Korbin,

2007). Research on this thesis investigates the environment and spatial aspect, especially into the children domains in the public realm.

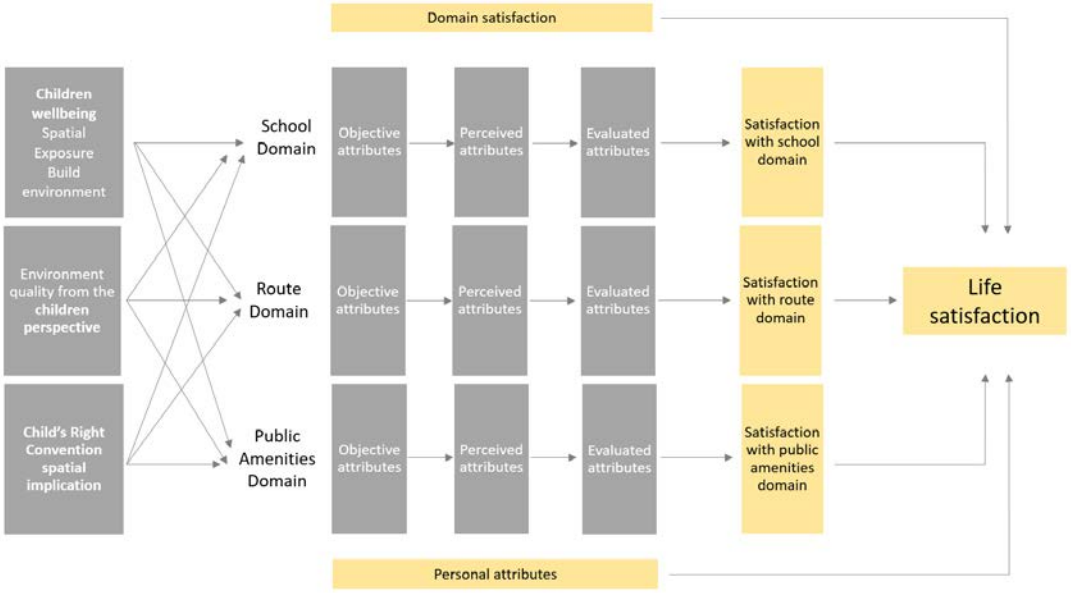
An overview of child wellbeing in twenty-one countries by UNICEF in 2007 found that countries whose children enjoy a high level of everyday freedom include Scandinavian countries and the Netherlands as having the highest level of subjective wellbeing. It is measured as the best outcome around families and peer relationships, and also behaviour and risks. In 2013, a UNICEF report rated high ranking on the Dutch children in terms of subjective wellbeing. The research found that the children in the Netherlands were ahead of their peers compared with twenty-nine of the worlds' richest countries. It is assessed on first, material wellbeing, health and safety, education, behaviours and risks, and housing and the environment. 95% of the children respondent considered themselves happy when asked how satisfied they were with their life. From these findings, it is obvious that the Dutch high level of subjective wellbeing can become the benchmark to be shared.

2.3. The nexus among children wellbeing, child friendly city, and subjective wellbeing

The children wellbeing in this research is highlighted on the spatial aspect and the built environment without diminishing the social aspect and the institutional resource and service quality respectively (Coulton and Korbin, 2007, Coulton and Fischer, 2010), in order to map the children domains in the neighbourhood. Based on the articles of the Child's Right Convention (Riggio, 2002) that have spatial implication in the neighbourhood planning, the children domains in the public realm can be categorized to the school domain, the route domain, and the public amenities domain (Gill, 2008, Loon and Frank, 2011).

Explaining further on the subjective wellbeing, the research on this thesis adopts a model showing the relationship between domain satisfaction and life satisfaction from Marans and Rodgers and Campbel in Marrans and Stimson that propose a model of satisfaction with the residential environment. In the context of the children domain in the public realm the paths thus be mapped from the three children domains including the school domain, the route domain, and the public amenities domain with the same level of analysis which is in this case, the neighbourhood level. The modified model can be seen on figure 6. This is called bottom-up model framework in which urban characteristic may affect satisfaction (Heller, Watson, et al., 2004) to related domain namely satisfaction to school domain, satisfaction to route domain, and satisfaction to public amenities domain. Moreover, the domain satisfaction and the children domains may contribute to overall life satisfaction under the subjective wellbeing, borrowing the Marrans and Rodgers model (Marans and Stimson, 2011). Bearing in mind that the city fits for children is the city fits for all (Riggio, 2002), the research aims to examine the residents' subjective wellbeing in the neighbourhood regardless their age groups.

Figure 6: Model showing the relationship between domain satisfaction and life satisfaction (Campbell et al. 1976a) which is modified to the children domain in the public realm context

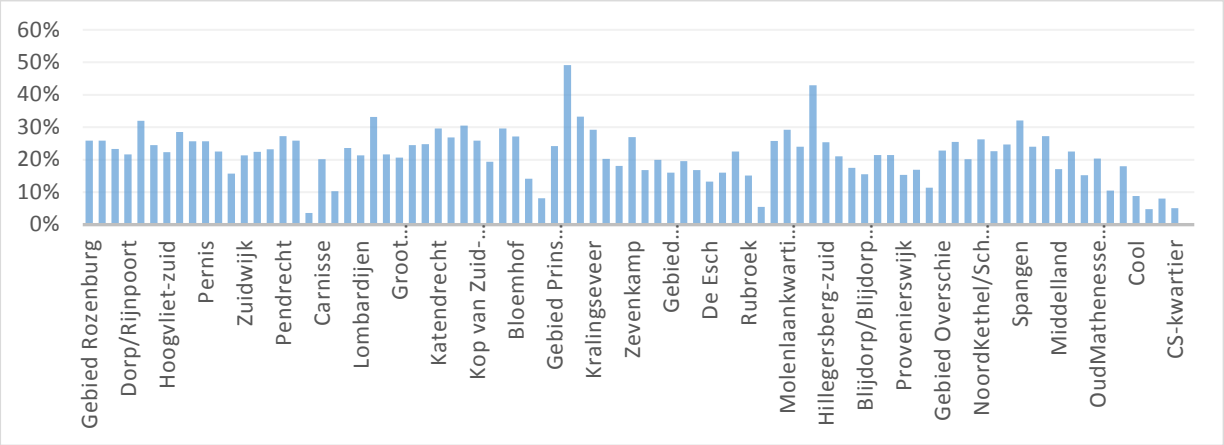


Source: Author 2017

2.4. Child friendly city policy in the city of Rotterdam context

The city of Rotterdam has adopted the policy to make Rotterdam child-friendly more than a decade ago. The importance of child friendly city policy in Rotterdam can be figured by seeing the fact that the numbers of families with children in a neighbourhood reach up to 49% as seen in figure 7, while the average in the city of Rotterdam is 22%. The 'kindvriendlijk' report shows the program aims to improve safe routes and safe play areas, to improve facilities and activities for children, to create an attractive public space, to build more child-friendly houses, and to create a community spirit in the neighbourhood. In the social sphere, children participation is coined as valuable. The availability of at least six hours of afterschool activities per week in the elementary schools is considered as a success story in child friendly city policy in the Rotterdam. Also, collaboration with other partners, such as housing corporations, project developers, and universities is essential in the making of a more child-friendly Rotterdam.

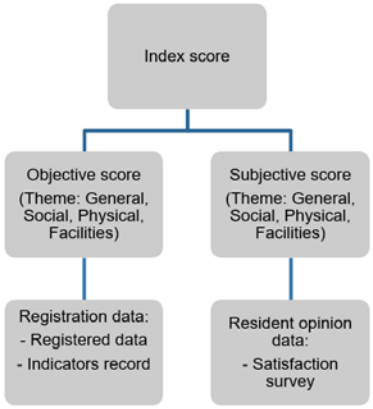
Figure 7: Percentage of families with children aged up to 18 year old



Source: Rotterdam *Kindvriendelijk* report 2014

Currently, the child-friendliness of the city of Rotterdam is monitored every other year. Based on the last *Kindvriendelijk* report in 2014, a coherent picture of the child-friendliness of the neighbourhoods covers social, physical, safety, and the facilities themes in the neighbourhood level. Covering 14 regions and 85 neighbourhoods in the city of Rotterdam, each themes consists of subthemes and a subjective score and an objective score as can be seen in figure 8. The subjective score consists of indicators gathered from the survey asking for opinions on satisfaction such as satisfaction on the attractiveness of play spaces, sport spaces, and the meeting places for children in the neighbourhood. The objective score consists of indicators from different theme official records for example the availability and proximity to schools and playgrounds. The child friendly city monitor report clearly defines the distinction between objective and subjective scoring in the neighbourhood level. Also, the differences of child friendliness among neighbourhoods in the Rotterdam can be seen in figure 8 below.

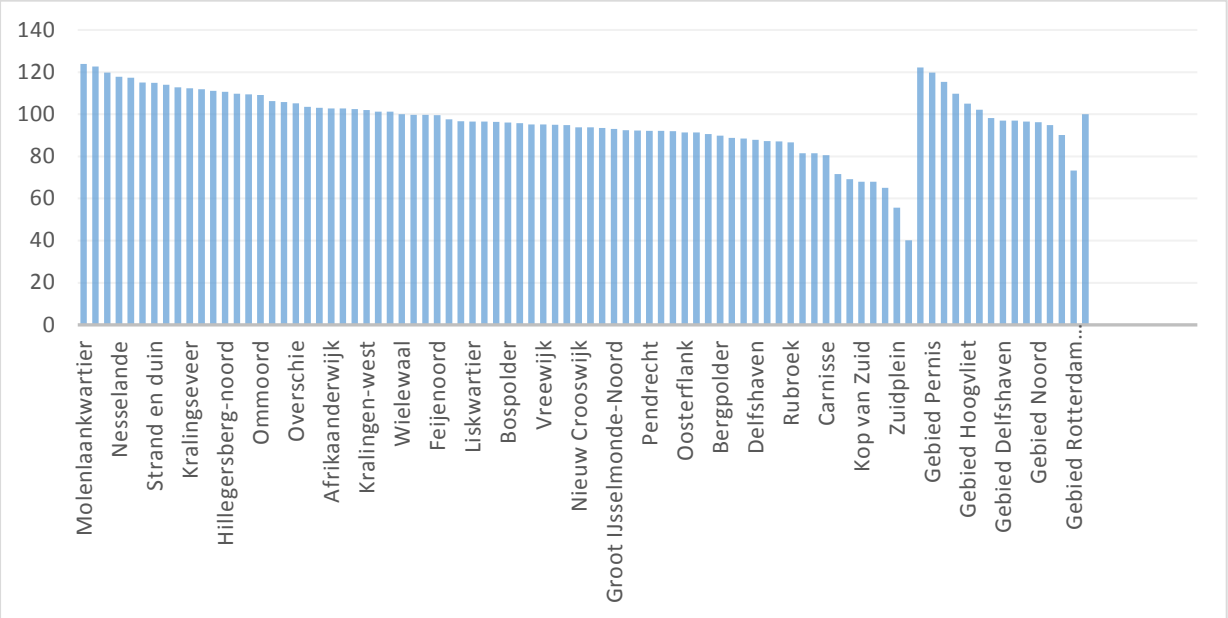
Figure 8: Objective and subjective scores in the neighbourhood profile and child-friendly city monitor of Rotterdam



Source: Rotterdam Wijkprofile (2014)

The theme covers in the child friendly city of Rotterdam monitoring report including general, social, physical, and facilities which are scored based on the neighbourhoods as seen in figure 9. The general theme covers suitable neighbourhood for different age groups for children up to 4 years old, 4 to 13 years old and 13 to 18 years old in the subjective measurement. The social theme covers parenting condition in the subjective measurement and index of living condition as objective measurement. The physical theme covers satisfaction on family suitability in respect of housing and the playground's quality and presence in subjective measurement. In the objective score, measurement of the minimum net floor area in dwelling, the type of the house and the proximity of the dwelling area to the playground are covered. The safety theme covers satisfaction on road safety, safety when children crossing the street, security in the playgrounds, in the subjective score. Also, it covers child friendly school route, and number of reported violence in the objective score. The facilities theme covers satisfaction of the resident in the presence of playground and preschools, childcare, outpatient care, primary schools, and secondary schools, art and culture space, sport arena, and places for young people in the subjective measurement. In the objective measurement it covers the presence and proximity from home to children playground, preschools, childcare, primary school, and secondary schools including VMBO, HAVO, VWO as the Netherlands secondary school options. This thesis will focus on the availability and accessibility of the three children domains as part of child friendly city policy in the Rotterdam which includes the school domain, the route domain, and the public amenities for children domain, and to find their influence to subjective wellbeing (domain satisfaction and life satisfaction) of the people including adult and children in the neighbourhood.

Figure 9: Rotterdam Child-Friendly City index



Source: Rotterdam Kindvriendelijk report 2014

2.5. Conceptual Framework

Children domain in the public realm can be defined as children destination in the public spaces that are available and accessible for children to gather, learn, and play (Coulton and Fischer, 2010, van den Berg, 2017, Karssenberg, 2016). The availability of the children domain can be explained as the presence of the spaces where children exist. The accessibility of the children domain can be seen as proximity from home which is measured under certain standard depending on the function of the space. The children domain in the public realm, which is the independent variable of the research, is composed of objective characteristic. The objective characteristics are factual data on the individual and characteristics of the children domain in the public realm. Analysing the children domains as a spatial implication of the Child's Right Convention reflects that most of the children domains are the core element in neighbourhood planning theory (Park and Rogers, 2015). The research is to find out to what extent the availability and accessibility of the children domains in the public realm influence the subjective wellbeing of the people in the neighbourhood.

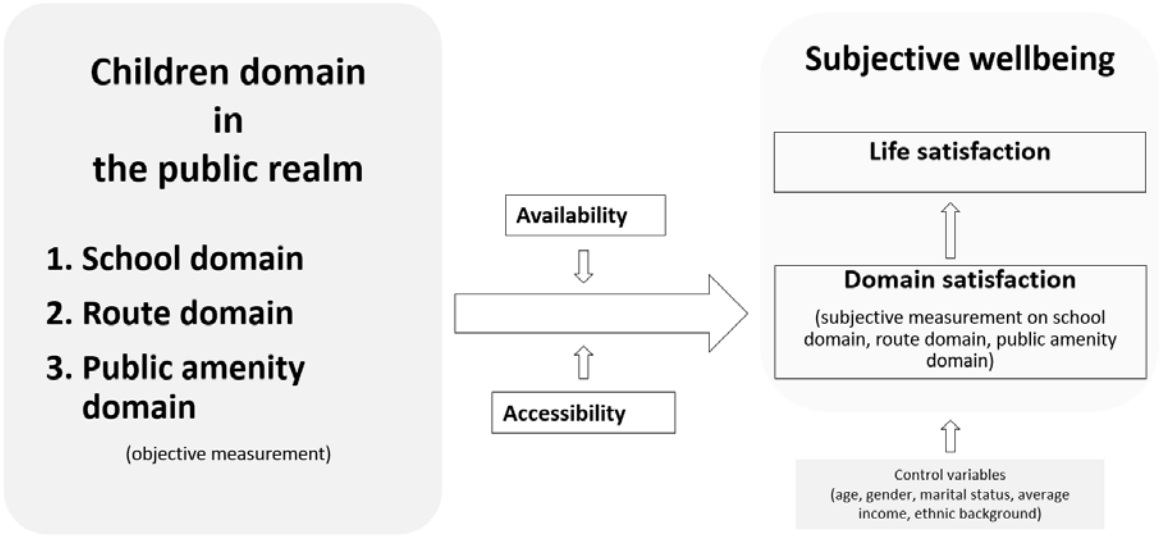
The dependent variable of the research is subjective wellbeing which is composed of both affective and cognitive aspects and measured by the respondent overall life satisfaction. Adopting the bottom-up model (Marans and Stimson, 2011), the overall life satisfaction is determined by satisfaction in major life domains such as family life, work, and health, and other urban life domain that derived from the objective condition of the domains. In this research, the domain satisfaction is derived from the subjective characteristics of the children domain in the public realm. The subjective characteristics are the people perception or evaluation of the children domain in the public realm.

Based on the theories, the first hypothesis is the characteristic of the children domain in the public realm predict satisfaction in domain satisfaction and life satisfaction. The second hypothesis is that the domain satisfaction mediates (Baron and Kenny, 1986) the relationship between the characteristic of children domain in the public realm and the overall life satisfaction under the subjective wellbeing. Moreover, such personal attributes including age,

gender, marital status, average income, and ethnic background may interfere with the result. Therefore, there is an attempt to study the control variables to limit the interference.

In search of finding the relationship between the three children domains in the public realm with the subjective wellbeing in which the domain satisfaction perform as mediating variable and life satisfaction as the dependent variable, the conceptual framework can be seen in figure 10 below.

Figure 10: Conceptual framework



Source Author 2017

Chapter 3: Research Design and Methods

3.1. Revised research questions

Main research question:

1. How does the availability and accessibility of the children domain in the public realm affect the subjective wellbeing (domain satisfaction and life satisfaction) in Rotterdam?

Sub research questions:

2. Which indicators of the availability and accessibility of the children domain in the public realm significantly contribute to the satisfaction of the people on the children domain in the neighborhood?
3. How does the satisfaction on children domain in the public realm contribute to the life satisfaction of the people in the neighbourhood?
4. What other factors make child friendliness of a city and subjective wellbeing respectively differs among neighbourhoods?
5. What are the implications of the significant influence of children domain in the public realm in respect of subjective wellbeing on child friendly city policy?

3.2. Operationalization

In this section, based on the conceptual frameworks in this research, the operationalization comprises of two arrays of variables and indicators, first variables and indicators to answer the main research question, the sub research question number one and two, and second variables and indicators to answer the sub research question number four and number five that can be explained below.

First, the research variables and indicators are categorized under the independent variable (X), dependent variables (Y), mediating variables (M) derive from the conceptual framework. In this thesis, the children domain in the public realm is the independent variables including the availability and accessibility of the school domain, the route domain, and the public amenities domain that derive from the objective measurement from the child-friendly city monitor and based on the theoretical background (Loon and Frank, 2011, Riggio, 2002).

The subjective wellbeing which is the life satisfaction of the residents becomes the dependent variable to capture the affective aspect of subjective wellbeing. The control variables are used which include socio-demographic variables that are affecting levels of subjective wellbeing – life satisfaction based on the literature such as age, gender, marital status, average income, and ethnic background based on literature study (Brereton, Clinch, et al., 2008).

However, there is a mediating variable (M) which derive from the satisfactions to children domain in the public realm. The mediating variable is categorized under three children domain satisfaction including the school domain, the route domain, and the public amenities domain that is obtained from the subjective measurement based on the child friendly city monitor. The operationalization of the concepts on this thesis by different variables and indicators and the corresponding research analysis can be seen in Table 2 below.

Table 2: Operationalization of the research concepts – quantitative

Concept	Definition	Indicators	Value
Independent variable			
Children Domain in the public realm	School Domain Availability and accessibility of Preschool Primary school Secondary school	Preschool Percentage of shared preschool within walking distance Source: Kindvriendlijk dataset Primary school • Percentage of children within 500 meters of their own primary school • Percentage of homes within the average distance in Rotterdam to the nearest primary school (= 267 meters) Source: Kindvriendlijk dataset Secondary school • Percentage of homes within the average distance in Rotterdam to the nearest VMBO school (= 889 meters) • Percentage of homes within the average distance in Rotterdam to the nearest HAVO / VWO school (1,117 meters) • Percentage of h VMBO schools at relatively short distance from home • Percentage of homes within the average distance in Rotterdam to the nearest havo / vwo school (1,117 meters) Source: Kindvriendlijk dataset (Loon and Frank, 2011, Haugen, Holm, et al., 2012)	Ratio Percentage Number Objective measurement
	Route Domain Availability and safety of Safe route to school Pedestrian pathway Bike lane Public Transport hub	Traffic safety route • Percentage of homes that fall within potential areas of traffic within 25 meters of a 50-mile road or track • Percentage of homes with a primary school within 1,000 meters, without that a barrier Source: Kindvriendlijk dataset • Report of number of traffic accidents per 1,000 inhabitants Source: People, planet, prosperity data – 2014 Social safety route Report on number of violence and inconvenience per 1,000 inhabitantas Source: Kindvriendlijk dataset Physical provision • Pedestrian area per hectare • Share bicycle routes with marking of total length bicycle route network • Share of residents with OV stop (train, metro, tram) within reasonable distance <500m Source: People, planet, prosperity data – 2014 (Loon and Frank, 2011, Haugen, Holm, et al., 2012, Hillman, Adams, et al., 1990)	Percentage Numbers Area Objective measurement
	Public Amenities Domain Availability and accessibility of	Park and playground • Public open space within walking distance <250m • Park and playgrounds within walking distance 328m • Percentage of homes within a distance of 500 meter of a city park. • Percentage of homes with a relatively short distance from duim drop location	Numbers Percentage Objective measurement

	• Play space near home • Park and Playground • Child care • Sport, cultural and recreational facilities • Health facilities or clinic	• *Average of children playrooms on a very relatively short distance from home* Source: Kindvriendlijk dataset Child care Percentage of home with childcare within walking distance center (= 355 meters) Source: Kindvriendlijk dataset Sport, Cultural and recreational facilities • Share of residents with a sport, cultural or recreational facility <500m or within walking distance • Several different types of sport, cultural and recreational facilities per inhabitant <1500m Source: People, planet, prosperity data – 2014) Clinic Shared clinic within walking distance Source: People, planet, prosperity data – 2014) (Johnson and Glover, 2013, Elsley, 2004)	
Concept	**Definition**	**Indicators**	**Value**
Mediating Variable			
Subjective wellbeing	**Domain satisfaction** • Satisfaction to general children domain • Satisfaction to school domain • Satisfaction to route domain • Satisfaction to public amenities domain	Satisfaction to school domain • Satisfied that in and around his neighbourhood is sufficient preschools • Satisfied finds that in and around his neighbourhood is sufficient primary schools • Satisfied that in and around his neighbourhood is sufficient secondary schools Source: Kindvriendlijk dataset Satisfaction to route domain - Traffic safety route • Percentage that agrees with the statement: I think that in and around my neighbourhood children have little traffic problem • Percentage that agrees with the statement: I think that children in enough places in and around my neighbourhood safe the Crossing the street • Percentage that agrees with the statement: I think that older children in and around my neighbourhood safely alone on the street can ride a bicycle Source: Kindvriendlijk dataset Satisfaction to route domain - Social safety route Percentage that agrees that neighbourhood often feel insecure Source: Kindvriendlijk dataset Satisfaction to route domain – physical provision route • Satisfied that the neighbourhood (very) suitable for children to About 4 years • Satisfied that the neighbourhood (very) caters for children of 4 Year to about 13 years • Satisfied that the neighbourhood (very) caters for children and young people aged 13 to about 18 years Source: Kindvriendlijk dataset Satisfaction to public amenities domain – park and playgrounds • Satisfied that the neighbourhood (very) suitable for children to About 4 years • Satisfied that the neighbourhood (very) caters for children of 4 Year to about 13 years • Satisfied that the neighbourhood (very) caters for children and young people aged 13 to about 18 years	Percentage Subjective measurement

		Source: Kindvriendlijk dataset Satisfaction to public amenities domain – sport, culture, recreation amenities, clinic, child care • Satisfied that the neighbourhood (very) suitable for children to About 4 years • Satisfied that the neighbourhood (very) caters for children of 4 Year to about 13 years • Satisfied that the neighbourhood (very) caters for children and young people aged 13 to about 18 years Source: Kindvriendlijk dataset (Diener, Napa-Scollon, et al., 2000, Dolan, Peasgood, et al., 2008)	
Concept	**Definition**	**Indicators**	**Value**
Dependent variable			
Subjective wellbeing	**Life satisfaction** Satisfaction to life as a whole	Answering the question all in all how satisfied are you with your life? Source: Rotterdam city – E-hero dataset (Veenhoven, 1996, Veenhoven, 2009)	0-4 (Categorical) Subjective measurement
Concept	**Definition**	**Indicators**	**Value**
Control variable			
Subjective wellbeing	**Life satisfaction**	Age Gender Household type Income Ethnicity background Source: Rotterdam city – E-hero dataset (Veenhoven, 1991, Easterlin, 2001)	Dummy Interval Objective measurement

Source: Author, 2017

Second, in search of finding the other factors that make both independent and dependent variables respectively differs among the neighbourhood, a literature study and a more insightful thoughts from key persons are obtained to support the analysis. Furthermore, this thesis is designed to use a mix method of the existing quantitative data and analysis to gain answers for the testing based research questions, as the main method, and the primary qualitative data and analysis as supporting to answer the explanatory sub research question and expected to conduct a policy recommendation in the last sub research question. Table 3 below explains operationalization of research concept in terms of the qualitative method.

Table 3: Operationalization of research concept – qualitative

Concept	Indicators	Relevant questions	method
Children Domain in the public realm	School Domain Availability and accessibility of Preschool Primary school Secondary school	What is your opinion about the school facilities, preschool, primary school, and the secondary schools in the neighbourhood? Is the proximity of the schools from home matter?	Qualitative measurement
	Route Domain Availability and safety of Safe route to school Pedestrian pathway Bike lane Public Transport hub	What do you think about the children route from home to school, from home to the public amenities, from school to the public amenities? Is it safe for children (0 to 18 years old)?	Qualitative measurement

	Public Amenities Domain Availability and accessibility of • Play space near home • Park and Playground • Child care • Sport, cultural and recreational facilities	What do you think about the presence of public amenities where children can have activities? Is the proximity of the public amenities matter for the people?	In-depth interview
Domain satisfaction	• Satisfaction to general children domain • Satisfaction to school domain • Satisfaction to route domain • Satisfaction to public amenities domain	What is your opinion about the school facilities, preschool, primary schools, and secondary schools in the neighbourhood? Are you satisfied? What do you think about the children route from home to school, from home to the public amenities, from school to the public amenities? Are you satisfied? What do you think about the presence of public amenities where children can have activities? Are you satisfied?	In-depth interview
Life satisfaction Satisfaction to life as a whole	Age Gender Household type Income Ethnicity background	What factor determine your life satisfaction? What do you think about the presence of the children in the neighbourhood?	In-depth interview

3.3. Research strategy and methodology

The main research strategy chosen in this thesis is desk research strategy, using secondary data analysis, a research strategy using existing quantitative methods and statistical technique on existing numerical data. There are several reason to use this strategy. First, because of the nature of the main question is testing a hypothesis that the children domains in the public realm influence the subjective wellbeing a significantly positive way in the context of the city of Rotterdam. Second, the research is deductive, with an opportunity to generalise the outcome, using a large number of unit analyses and a large number of variables from a set of reliable dataset that provided by the municipality of Rotterdam and the E-hero organization from the Erasmus University. Third, the strategy chosen allows to conduct statistical analysis on the cross-sectional existing quantitative data to achieve the research's objective, to find the relationship between the dependent variables (subjective wellbeing – life satisfaction) and independent variables (the availability and the accessibility of children domain in the public realm) through the mediating variable (subjective wellbeing – domain satisfaction) in the city of Rotterdam. This can also be seen as an attempt to answer the sub research question 1 and 2.

However, as the sub research question 3 is an explanatory by nature, a qualitative method in the form in depth interview as a strategy is chosen to complement the existing numerical data analysis. This strategy is necessary to support the findings on what other factor that make child-

friendliness and subjective wellbeing of the neighbourhood differs based on the theoretical study and the existing quantitative analysis. This attempt also useful to provide policy recommendation to the municipality, to what indicators they should be focus on in order to elevate the level of satisfaction of the Rotterdam resident, as well as to increase the child-friendliness of the neighbourhood. This mix-method chosen is expected to answer the sub research question 4 to conclude a policy recommendation as well. Therefore, by conducting a mix method research of existing quantitative data and primary qualitative data (an in-depth interview to the key person) a triangulation can be made in this research to enhance the reliability and validity.

The desk research strategy advantages are the usage of existing data sources that contains available information for a different purpose, covering a large number of observations, that makes the research efficient and cost effective (Thiel, 2014). The indicators required in this research covering the city scale complement with detail objective and subjective measurement cannot be collected through primary survey while it can be obtained through reliable secondary dataset. In this research, the dataset comprises of total 5,296 respondents that represent individuals in two different age groups, adult (18 years old and up), and children (below 18 years old) cannot also be compiled by primary survey in the given time and budget limitation.

The major disadvantage of the desk research is the operationalization phase, gathering and analysing the data can also labour intensive and time-consuming. Another disadvantage of the desk research is the validity and reliability of the data. This disadvantage is overcome in this thesis by triangulation of the data sources using the child-friendly city monitor or *Kindvriendlijk wijk* dataset from municipality, the subjective wellbeing data from e-hero organization from the Erasmus University, and the people, planet and prosperity from the municipality as reliable data sources.

The primary qualitative strategy chosen is in-depth interview to key person in the form of conversation during which the researchers gathers information by questioning the respondents. Since the research is a deductive study, the interview questions derive from the operationalization of the variables based on the theoretical framework (Thiel, 2014). In this research, the questionnaire guidelines is based on the three children domains in the public realm, including the school domain, the route domain, and the public amenities domain. The selection of the respondents is done selectively, only to experts in the child-friendly city, the municipality who is responsible to child-friendly city policy, and child-friendly city activists, and children in the neighbourhood. The in-depth interview is conducted to get a grip on other factors that influence the child-friendly city and the subjective wellbeing. Moreover, the in-depth interview is also conducted to review the draft quantitative analysis findings to enable a thorough investigation on each children domain indicators that significantly influence the domain satisfaction and the life satisfaction. In doing so the transferability of the findings from the analysis can be assured.

The disadvantage of qualitative research is that often accused as too subjective as it may consist of the researcher's own interpretations. Another objection is that it is impossible to prove causality with qualitative data (Thiel, 2014). Therefore, the mix-method is chosen to overcome the problems as well as enhance the reliability and validity of the current research.

In addition, as the main research method is existing quantitative analysis, it is necessary to increase the robustness of the analysis. Based on theory, five control variables are included in the statistic model which influence the subjective wellbeing – life satisfaction respectively such as age, gender, household, income, and ethnicity background (Casas, Sarriera, et al., 2012). These control variables are included in the analysis to limit their potential interfering influence to the dependent variable, so that it produce a more reliable the estimated effects (Thiel, 2014).

3.4. Data collection

The main research method in this research is the existing secondary data analysis uses quantitative data from authentic resources. The secondary data is gathered from three different sources that are used for a different purpose of research. The first data is obtained from the child-friendly city monitor (*Kindvriendelijk wijk*) data from the municipality. The second data source is from the "People, Planet, and Prospertity" dataset gathered from the Rotterdam neighbourhood profile (Rotterdam *Wijkprofiel*) from the municipality. The third data source is derived from the E-hero organization from Erasmus University who collect data on subjective wellbeing in the neighbourhood level of the city of Rotterdam. The three different sources of datasets are combined since they are pertained to similar level of measurement specifically on the neighbourhood level in the city of Rotterdam.

However, the drawback of the desk research strategy is the limitation of variables since the data is used for different purpose research. The disadvantage of the quantitative method is that some indicator data cannot be found. The proxy technique is used to overcome the limitation. In order to fill the gap of variables needed, the research adopts different variables with similar measurement aims from different sources for different research purposes. In this thesis, the availability of public library and museum data cannot be found from the dataset. The availability of cultural and recreation facilities then is used as a proxy. The same technique is used when an indicator has not passed the normality test in the statistical post estimation process.

In the primary qualitative method, as it is conducted to support the analysis since by nature, the subjective wellbeing is qualitative and tends to the primary data collection, selective key persons are chosen through purposive sampling technique since it gives the advantages to draw a non-probability sample. The primary qualitative data to support the analysis is done by conducting the in-depth interview with the key person of child friendly city including experts in the field, municipality and district representatives and residents from the neighbourhoods in Rotterdam. This research also including the representative from children residents from the neighbourhoods. By considering the children perspectives, the research on the children domain of the public realm synchronize with the heart of child friendly city (Riggio, 2002), to appreciate the children voices on the built environment where they live.

Table 4: Table of the in-depth interview respondents

No	Child-friendly city stakeholder representative	Respondents' attributes	Location of the interview
1	Local government of Rotterdam	Promising neighbourhood 2014-2018, Child-friendly city, Urban Planning department	Netherlands
2	District government of Feijenoord, Rotterdam	Policy advisor	Netherlands
3	A mother of two young children, Katendrecht, Rotterdam	Dutch, architect, neighbourhood activist	Netherlands
4	A father of three children, Afrikanderwijk, Rotterdam	Pakistani, textile business owner	Netherlands
5	A facilitator at Feijenoord community center, Rotterdam	Dutch born Antiles, neighbourhood activist	Netherlands
6	A boy, Feijenoord, Rotterdam	Turkish, age 18, secondary school student	Netherlands
7	A boy, Katendrecht, Rotterdam	Dutch, age 10	Netherlands
8	A girl, Katendrecht, Rotterdam	Dutch, age 7	Netherlands
9	Landscape architect and pedagogic, Oslo	Environmental planner with children and youth	Norway
10	Writer and researcher, London	Rethinking childhood	through email
11	Landscape architect and pedagogic, Berlin	an activist and pedagogic practitioner from *Grun Macht Schule*	Germany

12	Researcher, activist and pedagogic	Former president of European Network of Child Friendly City, National policy advisor	Belgium

Source: Author, 2017

Moreover, a semi-structured interview is chosen in this research based on the operationalization of the variables derived from the theoretical framework to gain flexibility in the direction of the interview within the research topic. The semi-structured interview guidelines to conduct the in-depth interview can be seen in annex 1.

3.5. Validity and reliability

In case of elevating the validity and reliability of the research, in this thesis, triangulation can be performed in several level. First, the strategy chosen, a mix-method of existing quantitative data as the main research method and primary qualitative data in the form of in-depth interview to support the quantitative analysis. The research's mix-method of existing quantitative data analysis and supported by primary qualitative data analysis may enhance the research to the next level in terms of validity.

Second, a triangulation also can be found in the data sources. Since the existing quantitative datasets come from three different sources, thus, it elevates the validity and reliability of the research. The first dataset is derived from the child-friendly city monitor from the municipality that covers 30,000 respondents from 85 neighbourhood in the city of Rotterdam. The data comprises of different themes including social, physical, safety and facilities. The second dataset is from the E-hero on Rotterdam subjective wellbeing, which is gathered from 99 neighbourhood from 5,296 respondents. The third dataset is derived from the Rotterdam *Wijkprofiel* from the municipality and people-planet-prosperity dataset that covers 92 neighbourhood. This research's datasets sources are good quality and high level in terms of reliability. The amount of respondents also may enhance the reliability of the research. However, the differences in scale occur on the three datasets, therefore, the intersection of the three datasets in terms of number of neighbourhoods is used to start a similar, comparable and more validated dataset as the base of the research.

Third, another advantage of the existing quantitative data and analysis is to ensure high external validity and allows for the generalization the result (Thiel, 2014). However, in this thesis, to ensure the internal validity concerning personal characteristic on life satisfaction that may interfere with the result of the research, the research studies the control variables. The control variables for the dependent variable life satisfaction chosen are based on the literature review includes age, gender, marital status, average income, ethnic background, to limit such interference (Thiel, 2014).

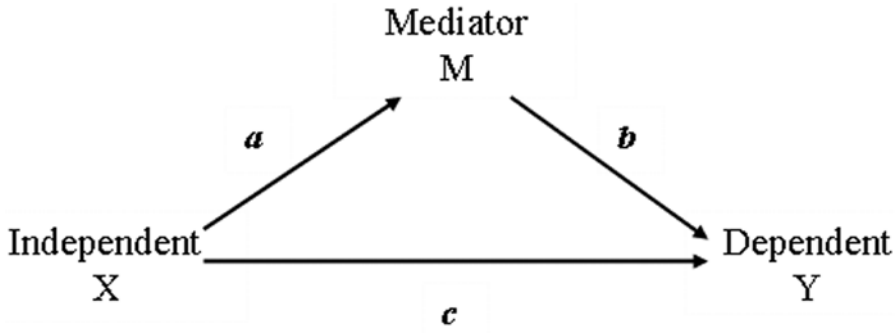
Fourth, in the analysis technique, factor analysis is conducted to get a factor score based on several indicators that have different value. There are two option in conducting one value for several indicators, first the index score and second the factor score. The index score is to calculate the linear combination by ignoring weights. The factor score is to calculate the linear combination via an optimally weighted linear combination. In this research, the factor score is taken as an attempt to elevate the validity of measurement instrument (Thiel, 2014).

3.6. Data analysis technique

This research is mainly focused on quantitative analysis using secondary data, by conducting statistical analysis using STATA program. Since the dependent variable is discrete and categorical, probit regression is used to model dichotomous or binary, and continuous outcome variables. The process covers from the dataset preparation, descriptive analysis, factor analysis, and then followed by the regression modelling test.

Hypothetically, the children domain satisfaction (M-variables) become the mediated path between the influences of children domain in the public realm (X-variables) that affect the subjective wellbeing – life satisfaction (Y-variables). A single mediator model can be seen in figure 15 below.

Figure 11: A three variable non-recursive causal model



Source: Baron and Kenny (1986)

In this research, the variable children domain satisfaction functions as the mediator when it meets the conditions as seen in figure 11. First, the independent variable, children domain in the public realm, significantly account for variations in the presumed mediator, in this thesis subjective wellbeing – domain satisfaction (path a). Second, (b) variation in the mediator significantly account for the dependent variable, in this case, the subjective wellbeing – life satisfaction (path b). Third, (c) when path a and path b are then controlled, the relation between the independent and dependent variable is no longer significant, with the strongest when path c, the direct affect, is zero (Xinshu Zhao, John G. Lynch, et al., 2011). This research doesn't aim to the establishment of mediating variable, but to examine the mediation. Furthermore, to test mediation, three following regression equations should be made: first, regressing the mediator on the independent variable (path-a); second, regressing the dependent variable on the independent variable (path-c); and third, regressing the dependent variable both the independent variable and the mediator (path-a + path-b). Moreover, additional regression, regressing the dependent variable on the mediator is also done to foresee the relationship of both variables (path-b).

In this research, an ordered probit regression model is chosen as the statistical model for path-a + path b and path c because the dependent variable is ordered outcomes. The dependent variable, the life satisfaction under the subjective wellbeing has a scale from 0 to 4. However, a linear regression is chosen for path-a, since the mediator, the children domain satisfaction in the form of continuous variable.

In an ordered probit, there is a distinction between an observed binary outcome y, viewed as the discrete realizations of an underlying, unobservable (latent) continuous random variable, y^*. An index model for a single latent variable y^* would satisfy a linear regression that can be seen in this formula:

Formula 1: Probit Model

$$y_i^* = \mathbf{x}_i'\beta + u_i$$

$$y_i = j \quad \text{if} \quad \alpha_{j-1} < y_i^* \leq \alpha_j$$

In this equation, *x* is a covariate vector, *β* is a vector of regression coefficient, and *u* is the error term. The probability that observation will select alternative *j* is:

$$p_{ij} = p(y_i = j) = p\left(\alpha_{j-1} < y_i^* \leq \alpha_j\right) = F\left(\alpha_j - \mathbf{x}_i'\beta\right) - F\left(\alpha_{j-1} - \mathbf{x}_i'\beta\right)$$

The ordered probit model with *j* alternatives will have one set of the coefficient with *(j-1)* intercepts and will have j sets of marginal effects. Because only the signs of the coefficients can only be interpreted, the marginal effects of the ordered probit models need to be estimated to determine the marginal effect of an increase in a regressor x on the probability of selecting alternative j, in this formula:

$$\partial p_{ij}/\partial \mathbf{x}_{ri} = \left\{F'\left(\alpha_{j-1} - \mathbf{x}_i'\beta\right) - F'\left(\alpha_j - \mathbf{x}_i'\beta\right)\right\}\beta_r$$

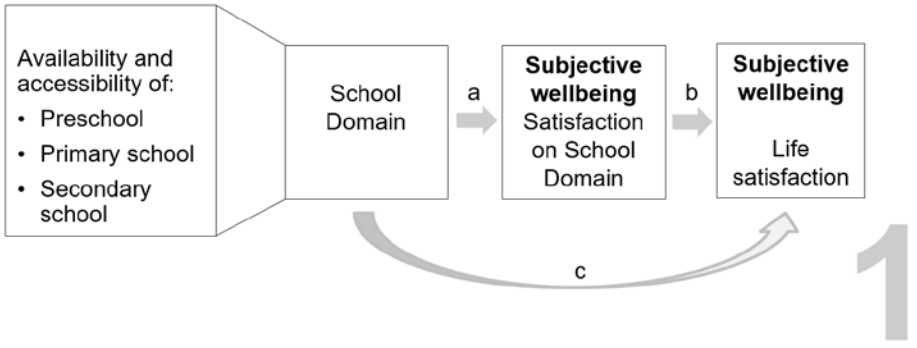
Multiple ordered probit regression is conducted to answer the main research question and the sub research question 1 and 2. There are three inferential analysis models that are conducted in this research, to test the mediating role of the domain satisfaction, as Baron and Kenny state:

> "To test mediation, one should estimate the three following regression equations: first, regressing the mediator on the independent variables; second, regressing the dependent variable on the independent variable; and third, regressing the dependent variable on both the independent variable and on the mediator" (Xinshu Zhao, John G. Lynch, et al., 2011)

Moreover, based on Baron and Kenny procedure to test if mediating effect applies and to answer the main research question, as well as the first and the second sub research questions, four models are conducted in this research. First, path-a, the linear regression of domain satisfaction (mediating variable) on children domain (independent variables). Second, path-c as the direct path, the ordered probit regression of life satisfaction (dependent variable) on the children domain (independent variable). Third, path-a and path-b as the indirect path, the ordered probit regression of life satisfaction on the children domain (independent variables) and the children domain satisfaction (mediating variable). Fourth, path-b an orderd probit regression of life satisfaction on the domain satisfaction. Moreover, the four inferential analysis models are done to the three children domain including the school domain, the route domain, and the public amenities domain as seen in figure 12, figure 13, and figure 14 below. By doing

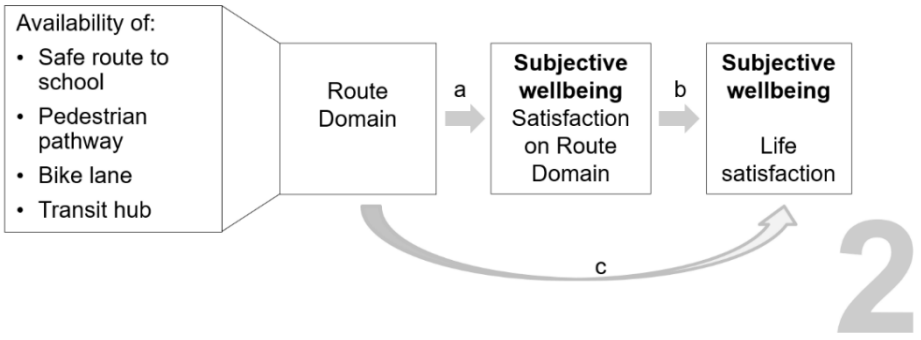
so, it is expected to find which indicators under the three domains that influence the life satisfaction directly or indirectly though the mediator.

Figure 12: The School domain inferential analysis scheme



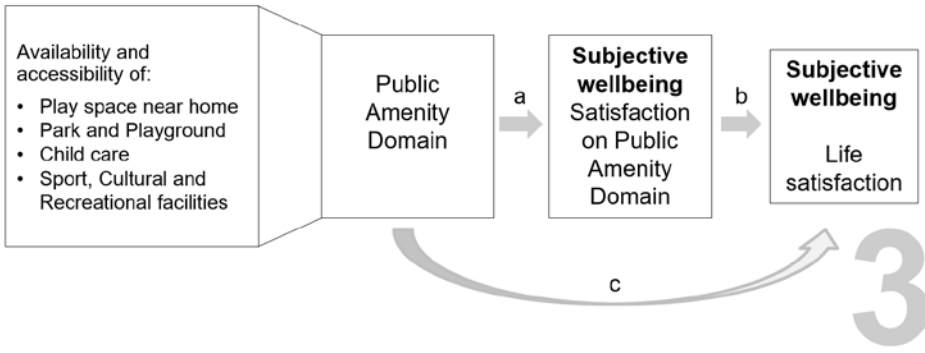
Source: Author 2017

Figure 13: The route domain relation inferential analysis scheme



Source: Author 2017

Figure 14: The public amenity domain inferential analysis scheme



Source: Author 2017

One necessary step before running the regression analysis, factor analysis is done to find the hidden relation among the set of variables in the mediating variables, the domain satisfaction. First, indicators of the school domain satisfaction (figure 12) are seen its correlation and constructed into satisfaction to school domain factor score. Second, through the factor analysis, the route domain satisfaction value can be constructed from a set of indicators (figure 13). Third, the same procedure is done for the public amenity domain satisfaction (figure 14). In

the factor analysis, indicators are loaded into a factor through their correlation, in which the eigenvalue or the degree to which the factor forms a unified whole is counted with value as high as possible or at least >1 (Thiel, 2014). The advantage of the factor analysis is that one factor can ultimately become a new variable in which the indicators are measured based on their correlation. This step can also be seen as an attempt to elevate the validity of the measurement instrument (Thiel, 2014). Table 3 shows the indicators of children domain satisfaction that need to go through the factor analysis process to get one factor score before conducting the inferential analysis.

Furthermore, the multiple regression on the three children domains indicators to predict the domain satisfaction and the life satisfaction are done to figure out the significances of the relationship. Multiple regression is used since the predictors are varies to adequately predict and understand the variation in the subjective wellbeing (Alan C. Acook., 2012). In this thesis, the independent variables (X) consist of availability indicators and accessibility indicators. The dependent variable (Y) is also predicted by control variables including age, gender, marital status, average income, and ethnic background. However, due to the lack of availability of marital status data, proxy data on household is used to gain understanding on the adult status and the presence of children in the household and how this affects the subjective wellbeing.

The research question 4 is explained by referring to literature study, supported by the content analysis derived from qualitative secondary data analysis supported by the primary qualitative in-depth interview with key person of child-friendly city. The data gathers including statements, interview fragments are categorized based on each characteristic to describe the context in which the actors are involved. This research is a deductive study; therefore, the codes to categorize the data correspond with the operationalization. The next step is axial coding, to concentrate on the patterns of the stored data. In this analysis, different codes are compared and contrasted in search for a pattern, cause and effect relations, or another form of relationship. The drawback of the qualitative data analysis is that it is often accused of being subjective because it is mostly based on the researcher's interpretation. Since this thesis design is a mixed method with the quantitative secondary data supported by the qualitative in-depth interview, the disadvantage of being too subjective can be eliminated. Moreover, although managing qualitative data is not an easy task, an insight into understanding the reality can become the advantage of conducting the in-depth interview with the stakeholders including the expert on the child-friendly city to support the desk research strategy.

The fifth question is explained by the findings from the multiple inferential analysis in the research question number one to three and the descriptive analysis of the existing quantitative data method. The analysis is supported by the primary qualitative data method, in this case, the in-depth interview with the child-friendly city's stakeholder's representative. The Table 5 below shows an overview of data analysis method to find the answer to the main question and the sub-questions of the research.

Table 5: Overview of data analysis method

Research question	Data used	Method	Tools	Outcomes
How does children domain in the public realm affect the subjective wellbeing in Rotterdam?	Secondary data	Multiple ordered probit regression	STATA & arcGIS	Desk research - existing quantitative data, Statistical Analysis (Probit Regression model – STATA and arcGIS)
Which indicators of children domain of the public realm significantly contribute	Secondary data	Multiple ordered probit regression	STATA & arcGIS	Desk research - existing quantitative data

to the satisfaction of the people in the neighbourhood?		and mediation effect		Statistical Analysis (Probit Regression model – STATA and arcGIS)
How significant is the satisfaction on children domain of the public realm contributes to the subjective well-being of the people on the neighbourhood?	Secondary data	Multiple ordered probit regression and mediation effect	STATA & arcGIS	Desk research - existing quantitative data statistical Analysis (Probit Regression model – STATA and arcGIS)
What other factors make child friendliness of a city and subjective wellbeing respectively differs among neighbourhoods?	Secondary data + primary qualitative data (stakeholder's in-depth interview)	Narrative analysis	Descriptive analysis based on existing data + Primary qualitative	Desk research using existing quantitative data statistical analysis (descriptive) + Primary Qualitative research methodthrough semi structured in depth interview with key actors
What are the implication of the significant influence of children domain in the public realm to subjective wellbeing on child friendly city policy?	Secondary data + primary qualitative data (stakeholder's in-depth interview)	Narrative analysis	Descriptive analysis based on existing data + Primary qualitative	Based on the desk research using existing quantitative data analysis and findings supported by primary qualitative method through the in-depth interview with key actors

Chapter 4: Research Findings

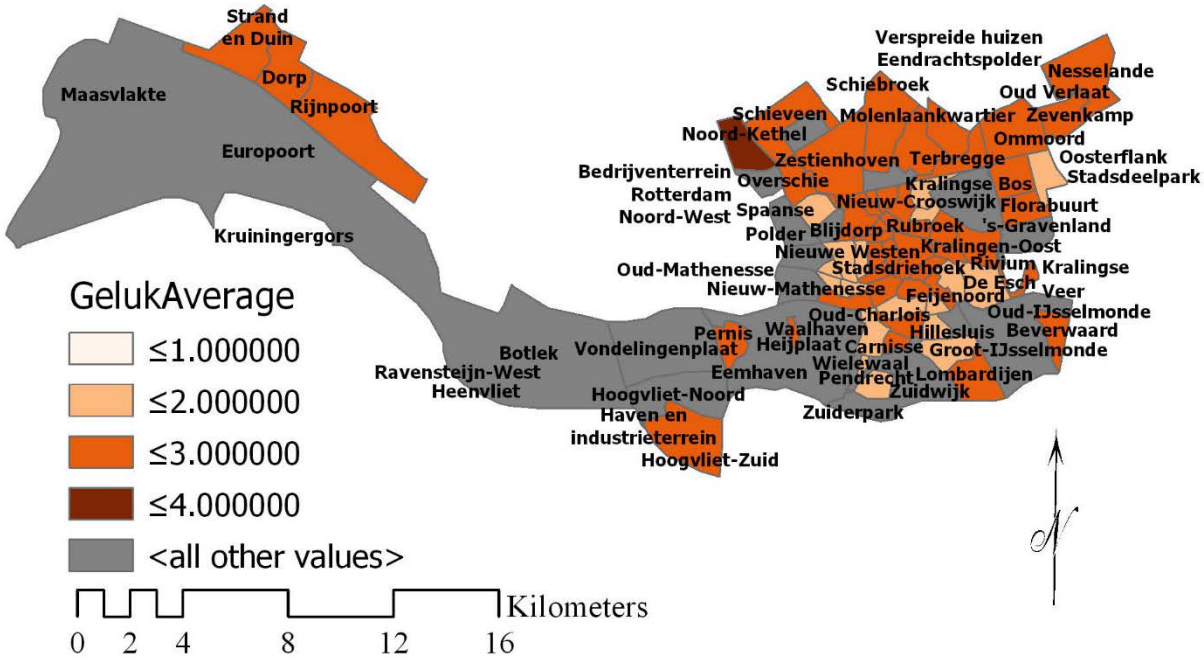
This chapter elaborates data and the findings mainly based on the statistic inferential analysis to answer the research questions. In addition, the research also conducts spatial analysis and narrative analysis based on in-depth interview to key actors in the field of child-friendly city and the city of Rotterdam's stakeholders. This chapter comprises of four parts including, first, the overview of Rotterdam as the research area. Second, the overview of the data in the form of descriptive analysis of the children domain in the public realm data and subjective wellbeing data in the city of Rotterdam. It also elaborates the post estimation through several tests to the datasets and the preparation to the regression analysis. Third, the data analysis that includes regression analysis using STATA program and its findings in the three children domain in the public realm, including the school domain, the route domain, and the public amenities domain. In this session, spatial analysis using ArcGIS program and also narrative qualitative findings are also elaborated. Fourth, an investigation of more factors that affect child-friendliness and subjective wellbeing respectively, through descriptive quantitative findings, literature study, and the findings form the qualitative analysis.

4.1. Overview of the research area

Rotterdam is a municipality, located in South Holland, the Netherlands. With total population 638,221 (2017), total area 208.8 km2, and density 3,056.6 inhabitants/km2, Rotterdam aims to attract family and children back to live in the city. The city multi-ethnicity background enlivens the city where it is recognised as one of the most diverse city in the country. The number of children from 0 to under 18 years old is 102,705 children or 19% of the total population.

Rotterdam's subjective wellbeing distribution as seen in figure 15, shows that life satisfaction distribution in Rotterdam that covers 71 neighborhood (please see the neighborhood listed on Annex 4). The map shows the average value of life satisfaction in the neighborhood with Oomnord and Noord Kethel as part of the highest group with score 4. Most of the neighborhood in the south of the Maas river can be seen as less satisfied with their life with score 3.

Figure 15 Subjective wellbeing distribution map of Rotterdam based on the Ehero, Erasmus University data using arc GIS



Source: Author, 2017

Rotterdam's plan for child-friendly city-based on the 2010 plan 'Building blocks for a child-friendly city' translated as a shift in the target from single young men and women to middle-class families that places parents and children in the front row of demographic transformation. The city resembles the success story of the city of Vancouver which developed more family-friendly housing in the inner-city neighborhoods and spatial strategies to combine family care and work (van den Berg, 2017), and pinpointed by the municipality as follow:

> "Nine neighborhoods in the 'Rotterdam's Promising Neighborhoods 2014-2018' include: Middlelland, Nieuwe Westen, Oude Norden, Liskwartier, Nieuw-Croswijk, Kralingen-West, Entreport, Katendrecht, Lloydpier." (Rotterdam municipality, based on an in-depth interview)

Accessibility to workplace and to public amenities in terms of proximity to amenities and proximity to work that makes it easier to combine work and family life are seen as necessary to find the city as an attractive place to live. In this chapter, proximity to amenities that are suitable for children such as proximity to park and playground, recreational, health facilities, childcare as well as proximity to education facilities as the children domain in the city are assessed. It is done to foresee their impact to the satisfaction that the area suitable for children and yet to the life satisfaction of the residents.

4.2. Overview of the data

This thesis uses three different sources of the data to create triangulation in the data sources which are necessary to increase the validity of the research. Due to the differences in scale, the dependent variable dataset, subjective wellbeing data from the E-hero organization at the Erasmus University, is used as the base to link with the data from the child-friendly city monitor, and the people planet and prosperity dataset from the Rotterdam municipality using certain formulas in the excel program.

The data contains 5,296 observation, 81 variants. It comprises of discrete and categorical variable, dummy variables, and continuous variables. Multiple regression is chosen to adequately predict the variance of the dependent variable and figure out a number of predictors that affect the outcomes. In this research, there are two regression model that is used. First, because the dependent variable, subjective wellbeing – life satisfaction's type is discrete and categorical, ordered probit inferential analysis is chosen. Second, regression model uses linear regression to regress the mediating variable which is continuous. The predictors in the form of independent variables such as how proximity to the school, to park and playgrounds, to health care facilities, and other facilities in the neighbourhood under the children domain in the public realm, influence the subjective wellbeing (Dolan, Peasgood, et al., 2008) is empirically exercised. The predictors such as age, gender, income, ethnicity, and marital status (Robert J. Rogerson, 1999) as the control variable to the level of subjective wellbeing of the resident will be tested.

The subjective wellbeing dataset is based on questioning individual on how satisfied they are with they own life, within the score of 0 to 4, where 4 stands for the most satisfy group. Figure 17 shows that 61.86% of the respondent belongs to the most satisfy group. The data includes gender, age, household, income, the ethnic background that set as control variables for the life satisfaction as dependent variables (Veenhoven, 1996) as an expectation to reduce bias in the equation model (Young, 2009).

The respondent composition is 56.55% female and 43.45% male of which 84.18% are adults from 18 to 65 years, and although it is 5.82% children up to 18 years old. This attempt relates

to the heart of the Child's Right Convention since the research accommodates children's perspective, although the age range of the children respondent limited from 13 to 18 years old. The type of the household varies from a real couple with home grown children 27.79%, single parent with home grown children 8.12%, couples with no child 31.61%, live alone 23.34%, student 2.02%, other 0.11% and not available 7.01%. The range of income under 1,100 euro per month 19.35%, 1,100 to 1,500 euro per month 14.12%, 1,500 to 2,000 euro per month 16.33%, 2,000 to 3,3350 euro per month reaches the highest group 22.79%, and more than 3,350 euro per month 18.52%. The income range from the dataset shows that the distribution is quite equal to each range of income which is good to reduce bias in the research's outcome. The diversity of Rotterdam is covered in the dataset in which from nine ethnic group namely, Suriname, other non-western, other western, other European Union, Turkey, Morocco, Netherlands Antillean or Aruba, Cape Verde, and the last, the native who has the highest number 53.85% of the respondent.

The dependent variable comprises of 5,058 individual respondents. Based on the normality test, the standard deviation 0.78 reflects that a large amount of variation in the dependent variable (life satisfaction), but there is no problematic in skewness and kurtosis test since the kurtosis value is not >10 in the normality test of the dataset. With the mean value 3.45 (0-4 scale) as can be seen in figure 16 and figure 17, the dataset is considered normal and reliable to be used.

Figure 16: Summary and skewness/Kurtosis tests for normality of the dependent variable

```
. sum LifeSatisfaction, detail
```

LifeSatisfaction

Percentiles		Smallest		
1%	1	1		
5%	2	1		
10%	2	1	Obs	5,055
25%	3	1	Sum of Wgt.	5,055
50%	4		Mean	3.45183
		Largest	Std. Dev.	.7889749
75%	4	4		
90%	4	4	Variance	.6224813
95%	4	4	Skewness	-1.237236
99%	4	4	Kurtosis	3.52994

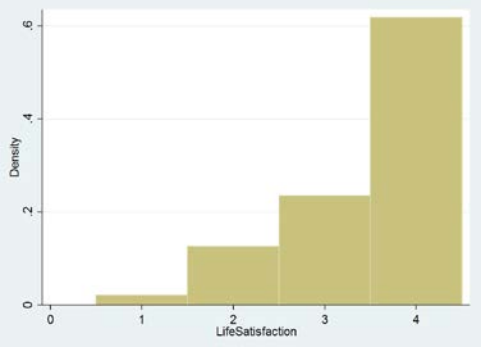
```
. sktest LifeSatisfaction
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
LifeSatisf~n	5,055	0.0000	0.0000	.	0.0000

Source: Author, 2017

Figure 17: Histogram and the distribution of the dependent variable from the dataset through STATA




```
. tab LifeSatisfaction
```

LifeSatisfaction	Freq.	Percent	Cum.
1	104	2.06	2.06
2	636	12.57	14.63
3	1,189	23.51	38.14
4	3,129	61.86	100.00
Total	5,058	100.00	

Source: Author, 2017

In this chapter, the children domain in the public realm, which is determined by the three domains including the school domain, the route domain, and the public amenities domain and their indicators are examined as predictors of the first, the predictors are also tested whether they have influence to the mediating variable which is the domain satisfaction – subjective wellbeing. Second, the independent variable predicts the dependent variable which is the subjective wellbeing - life satisfaction. Third, the mediating variable and the independent variable altogether become the predictor to life satisfaction - subjective wellbeing. Fourth, regression the mediating variable or the domain satisfaction on the dependent variable or the life satisfaction.

Before running the regression, post estimation on each regression is conducted based on the domain chosen. First, in the school domain, 2 missing value is generated, the data is considered normal and has no omitted variable. The data passes multicollinearity test with the mean variance inflation factors of 2.53 or <10. With the p-value of 0.000 or <0.05, there is significant evidence that the data is robust, after conducting the homokedasticity test.

Second, in the route domain, the data is normally distributed with W value equal to 0.99094 or <1 in the result of test for normality. The value of the mean variance inflation factors of 1.09 or <10 is considered as having no severe collinearity. The homokedasticity test shows that with the p-value is 0.0000 there is significant evidence that it is robust. The data has no omitted variables.

Third, in the public amenities domain, there are 243 missing values are generated. The data is normally distributed with W value equal to 0.99380 or <1. There is no collinearity since the mean variance inflation factors of 3.71 or <10. With the p-value of 0.000 or <0.05, there is significant evidence that the data is robust, after conducting the homokedasticity test. However, one indicators under the park and playground group in the public amenities domain has problem and failed to pass the omitted variable test. A proxy approach is taken to replace the indicator of average number of children playrooms on a very relatively short distance from home to similar indicator that represent the same nature. The omitted indicator then is replaced with percentage of playground within walking distance. After redoing the process of post estimation, no omitted variable founded. To sum up, all the regression model under the three children domain in public realm has passed all the necessary post estimation. This can be seen as an attempt to elevate the reliability of the research.

Furthermore, before running the regression, since the mediating variables, the domain satisfaction, derive from several indicators, a new variable is constructed using the factor analysis. It is used in this research because there is no predefined idea on the structure of the data. The new variable or the factor score is loaded by the weight and correlation between each variable and the factor. Moreover, after running factor analysis, more step should be done to get a clearer pattern of factor score. The process is called rotation which produces orthogonal factors to create an index without inter-correlated components (Kim and Mueller, 1978). Through this process, the new variable, in this research the domain satisfaction including the school domain satisfaction, the route domain satisfaction, and the public amenities domain satisfaction are prepared to be regressed on the independent variable to see if there is a direct or an indirect effect existed in the inferential analysis. Table 6 below elaborates the indicators for the domain satisfaction to the three children domains.

Table 6: The mediating variables - Domain satisfactions that need to go through the factor analysis process

Children domain in the public realm		
School domain		
	Domain satisfation	
	Satisfied that in and around his neighborhood is sufficient preschools	School domain satisfaction – factor score
	Satisfied that in and around his neighborhood is sufficient primary schools	
	Satisfied that in and around his neighborhood is sufficient secondary schools	
Route domain		
Route domain – traffic safety	**Domain satisfaction**	
	Satisfied that nearby children have little traffic problem	Route– traffic safety domain satisfaction – factor score
	Satisfied that children can cross safely nearby	
	Satisfied that children can safely ride on the street	
Route domain – social safety	**Domain satisfaction**	
	Perception of feeling insecure	
Route domain – physical provision	**Domain satisfaction**	
	Satisfaction on suitable area for 0 to 4 years old	Route - physical provision domain satisfaction – factor score
	Satisfaction on suitable area for 4 to 13 years old	
	Satisfaction on suitable area for 13 to 18 years old	
Public Amenities Domain		
Public amenities domain – park and playgrounds	**Domain satisfaction**	
	Satisfaction on suitable area for 0 to 4 years old	Public amenities - park and playground domain satisfaction – factor score
	Satisfaction on suitable area for 4 to 13 years old	
	Satisfaction on suitable area for 13 to 18 years old	
	Satisfaction on suitable area for 0 to 4 years old	
Public amenities domain – clinic, sport/culture/recreation, childcare	**Domain satisfaction**	
	Satisfaction on suitable area for 0 to 4 years old	Public amenities - sport/culture/recreation, clinic, and childcare domain satisfaction – factor score
	Satisfaction on suitable area for 4 to 13 years old	
	Satisfaction on suitable area for 13 to 18 years old	
	Satisfaction on suitable area for 0 to 4 years old	

Source: Author 2017

4.3. Data Analysis

4.3.1. The school domain and subjective wellbeing

Four models of regression are conducted with the level of confidence interval of 95% represent the respondent. As can be seen in table 7, in the first equation, the independent variables affect the mediator, respectively. The preschool, the primary school and the secondary school accessibilities influence the perception of the residents on how the area is suitable for children

in different age groups including children from 0 to 4 years old, 4 to 13 years old, and 13 to 18 years old. However, the availability of preschool and primary school and their proximity from home shows to positive direction. The availability of secondary school HAVO and VWO with average of 1,117m from home and the availability of secondary school VMBO with relatively short distance from home influence the domain satisfaction in positive sign as well. These findings proof the hypotheses as the school domain affects the domain satisfaction in positive direction.

Second, the independent variable is shown to affect the dependent variable. The direct equation, where the independent variables predict the dependent variable also shows that the availability of primary schools within walking distant influence the life satisfaction of residents positively with p value $p<0.1$. Third, in the indirect regression, the finding shows that the availability of the primary school within walking distance affects the life satisfaction significantly positive with p value $p<0.05$, in which the increase availability of the primary school within walking distance may increase the life satisfaction. The mediating variable affects the dependent variable in a negative sign respectively. In this regression, a competitive mediation occurs (Xinshu Zhao, John G. Lynch, et al., 2011). On the other hand, the increase of availability of the primary school within walking distance may decrease the domain satisfaction. In this case, the third model is rejected since the mediating effect shows different direction and cannot be supported by theoretical background. The fourth model, findings of regression of life satisfaction on domain satisfaction also shows negative direction, which cannot be supported by any theory. Therefore, in the school domain, the second equation model in the form of the direct model is the best model that can represent the influence of availability of the school domain to subjective wellbeing – life satisfaction without the mediating effect.

Based on the chosen model, several personal attributes significantly affects the subjective wellbeing - life satisfaction. First, being a woman has the probability to increase of life satisfaction in positive direction. Second, being a children (<18 years old) has the probability to increase the life satisfaction significantly. Third, in terms of income, the increase of the income level of groups below 1,500 Euro per month has the probability to decrease the life satisfaction significantly. While increase of income in the group within 2000 to 3,350 Euro per month has the probability to increase the life satisfaction respectively. The ethnicity background findings show that being a Suriname and other non-western have the probability to decrease the life satisfaction. Also, being a Moroccan and Cape Verde have the probability to decrease the life satisfaction as well.

The marginal effect that can be seen in annex 6 shows that in the least satisfied group, the increase of availability of the primary school within walking distance 0.4% may have probability of the increase one level of the group to the less satisfied group.

Table 7: The school domain inferential analysis

VARIABLES	(1) DomainSatisfaction	**(2)** LifeSatisfaction	(3) LifeSatisfaction	(4) LifeSatisfaction
Preschool within Walk Dist	0.263***	-0.00163	0.0120	
	(0.0506)	(0.0690)	(0.0692)	
Primary_267m	0.466***	-0.0613	-0.0405	
	(0.0918)	(0.124)	(0.125)	
Primary within Walk Dist	0.0967**	0.108*	0.112**	
	(0.0412)	(0.0565)	(0.0566)	
Second_VMBO_889m	-0.762***	-0.0886	-0.120	
	(0.0672)	(0.0909)	(0.0920)	

Second_HAVO/VWO_1117m	0.364***	0.000222	0.0145	
	(0.0551)	(0.0751)	(0.0755)	
Second_VMBO rel Short Dist	0.409***	0.00965	0.0272	
	(0.0178)	(0.0242)	(0.0253)	
Second_HAVO/VWO rel Short Dist	-0.364***	0.00498	-0.0104	
	(0.0109)	(0.0151)	(0.0164)	
SchoolDomainSatisfactionMV			-0.0450**	-0.0385**
			(0.0191)	(0.0175)
_Igender_1		0.0933***	0.0958***	0.0930***
		(0.0343)	(0.0343)	(0.0342)
_Ihousehold_1		0.0322	0.0345	0.0339
		(0.0863)	(0.0863)	(0.0861)
_Ihousehold_2		-0.0850	-0.0806	-0.0801
		(0.0976)	(0.0977)	(0.0975)
_Ihousehold_3		-0.00158	-0.000704	0.000627
		(0.0862)	(0.0862)	(0.0861)
_Ihousehold_4		0.00714	0.00601	0.0124
		(0.0874)	(0.0874)	(0.0873)
_Ihousehold_5		0.0675	0.0571	0.0631
		(0.139)	(0.139)	(0.138)
_Ihousehold_6		-0.382	-0.387	-0.364
		(0.464)	(0.465)	(0.465)
_Iage_1		0.247***	0.250***	0.251***
		(0.0788)	(0.0788)	(0.0787)
_Iincome_1		-0.293***	-0.298***	-0.293***
		(0.0828)	(0.0829)	(0.0827)
_Iincome_2		-0.163*	-0.166*	-0.162*
		(0.0853)	(0.0853)	(0.0852)
_Iincome_3		0.0978	0.0948	0.0970
		(0.0845)	(0.0845)	(0.0844)
_Iincome_4		0.143*	0.138*	0.134
		(0.0816)	(0.0817)	(0.0816)
_Iincome_5		0.0684	0.0627	0.0615
		(0.0841)	(0.0841)	(0.0840)
_Iethnicity_2		-0.326***	-0.324***	-0.327***
		(0.0631)	(0.0631)	(0.0626)
_Iethnicity_3		-0.119**	-0.124**	-0.113**
		(0.0514)	(0.0514)	(0.0503)
_Iethnicity_4		-0.116	-0.122	-0.120
		(0.0824)	(0.0825)	(0.0821)
_Iethnicity_5		-0.105	-0.107	-0.103
		(0.0714)	(0.0714)	(0.0710)
_Iethnicity_6		-0.247***	-0.250***	-0.242***
		(0.0916)	(0.0917)	(0.0910)
_Iethnicity_7		-0.0638	-0.0703	-0.0718
		(0.117)	(0.117)	(0.117)
_Iethnicity_8		-0.440***	-0.442***	-0.450***
		(0.0995)	(0.0995)	(0.0993)
_Iethnicity_9		-0.239**	-0.242**	-0.218**

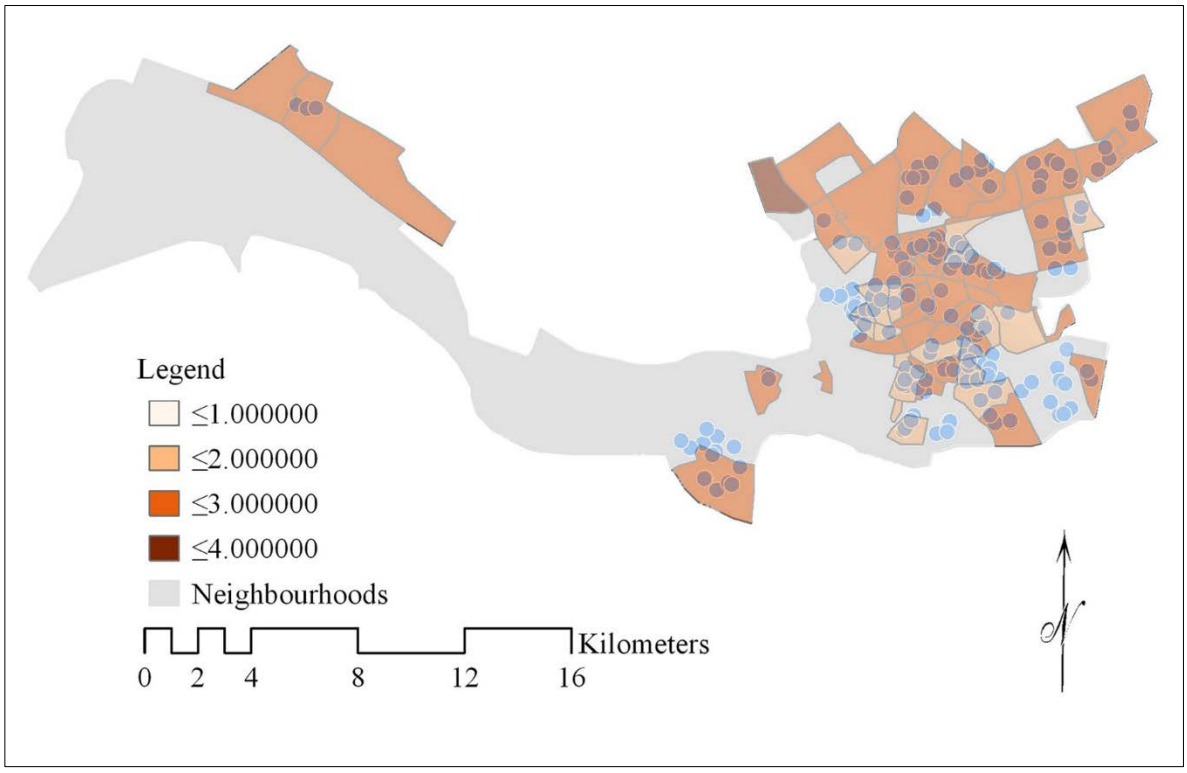
		(0.0989)	(0.0989)	(0.0979)
Constant cut1		-2.136***	-2.124***	-2.165***
		(0.123)	(0.123)	(0.113)
Constant cut2		-1.081***	-1.069***	-1.111***
		(0.117)	(0.117)	(0.107)
Constant cut3		-0.304***	-0.291**	-0.334***
		(0.116)	(0.117)	(0.106)
Constant	-0.336***			
	(0.0395)			
Observations	5,294	5,053	5,053	5,055
R-squared	0.185			
Pseudo R-squared		0.0212	0.0218	0.0209

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Author, 2017

The significance of proximity to the primary school from the residential hypothetically proves and relates with the theory on the importance of children's independent mobility (Hillman, Adams, et al., 1990) from home to school in their young age, in this research, in their primary schools' age. Based on the arc GIS data of the city of Rotterdam, in terms of spatial distribution, the primary schools are scattered around the residential area as can be seen in figure 18. The finding shows that the distribution of schools in the city reflects the composition of children in the primary school age group which reaches 49% of total children in the city of Rotterdam, which is the majority of the other age group.

Figure 18: The overlay of the spatial distribution of the primary schools and the life satisfaction



Source: Author, 2017

The map is overlaid to the graduation of life satisfaction map from the least satisfied group (1) to the most satisfied group (4). Based on the spatial distribution of the primary schools as seen in figure 18 below, the top three ranks neighbourhood where the primary school children aged 4 to 13 years old existed, includes Hoogfliet-Zuid, Stadsdriehoek, and Pernis. On the overlay of the spatial distribution of the primary schools and the life satisfaction, the findings show that the three neighbourhoods' average score on life satisfaction is on the level 3 groups out of 4 level scores. The other neighbourhood with lower level of life satisfaction, such as some neighbourhoods in the southern part of the Mass River are also provided with primary school availability.

To sum up, table 8 below shows that the availability and accessibility of primary school within walking distance from home significantly influences subjective wellbeing – life satisfaction of the resident. The availability and accessibility of primary school within walking distance from home also influences the domain satisfaction of the resident in the positive direction.

Table 8: The school domain that significantly affect subjective well-being

Subjective well-being	**Subjective characteristics**	**Objective characteristics**
Life satisfaction	**Children Domain satisfaction**	**School Domain**
	School domain satisfaction (+)	Availability and accessibility of primary school within walking distance (+)

Source: Author, 2017

The qualitative findings based on the in-depth interview to a mother of two primary children, a double income household who lives in Katendrecht area, reflects that the proximity to primary school matters when choosing the area to live.

> "Proximity to school from home matter, because it affects the daily life routine" (a mother of two young children, an architect, neighbourhood activist)

This thought complements the literature review. Based on theory, accessibility consideration is included in residential choice process (Haugen, Holm, et al., 2012) where accessibility to education is one of the preferences since it affects everyday life, especially for family with children. Based on a research on children independent mobility in two cities in England and Germany, Hillman also pinpoints a very strong correlation between the children safe route to school and the distance they have to travel. It is obvious that those living closer to school are more likely to walk independently or with their peers without adult supervision (Hillman, Adams, et al., 1990).

> "I love to walk alone or with my little sister and sometime cycling from home to school and back," (a native Dutch 10 year old boy, a Katendrecht resident).

The school is located approximately 400 m from home where walking distance is less than 500m. The route from home to school across a green open space with playgrounds and outdoor sport facilities where visually accessible housings surrounds the open space. These findings are relevant to several aspects of neighborhood planning and design. The planning decision affects the geographic catchment of schools that promotes independent mobility of children (Hillman, Adams, et al., 1990). The design of the neighborhood allows "neighborhood watch" that is known as one of the oldest and most effective crime prevention as conducted by the visual access from housings to the public realm.

4.3.2. The route domain and subjective wellbeing

Soon after children have learned to walk as they grow older, they are granted permission to cross the road by themselves. They go to school and to other distant places from home unaccompanied by adults. Gradually, they also start cycling and using public transport. As the Child's Right Convention promotes the children independent mobility, which can be defined as the freedom to travel around the neighbourhood without adult supervision (Tranter and Whitelegg, 1994), the issue of safety route becomes necessary. Based on the study on children independent mobility, safety on the route in terms of traffic safety and later on safety on the route in terms of social safety are necessary when analysing the children route domain (Hillman, Adams, et al., 1990). In the route domain, the safety route in terms of traffic safety and safety route in terms of social safety or the existence of the stranger's danger (Hillman, Adams, et al., 1990) is examined as well as the availability of physical provision to facilitate children as pedestrian, cyclist, and accessibility to public transport. Therefore, in the route domain sub chapter, three series of inferential analysis are conducted separately since the nature of the indicators are different, including first, the route domain in terms of traffic safety, second, the route domain in terms of social safety, and third, the school domain in terms of physical provision or the availability of pedestrian pathway, bicycle route, the accessibility of the transit hub.

The first equation series on the route domain is done for traffic safety. The equation comprises of four different models, in which the four models examine the mediating effect while finding the significant predictors to explain the subjective wellbeing – life satisfaction as the dependent variable.

The first model finds that percentage of home that falls within the area of traffic (25m of 50mile/hour road traffic) affects the domain satisfaction positive significantly. It can be explained that access to high speed road is an advantage. While percentages of home with barrier-free route to primary school up to 1,000 m and number of traffic accidents per 1,000 inhabitants also influence the domain satisfaction significantly in a negative trend.

On the second model, it can be seen that the reported number of accidents per 1,000 inhabitants affect subjective wellbeing significantly in the negative direction. The finding shows that the decreasing number of traffic accident, the better level of satisfaction of the respondents.

In the third model, where both the independent variables and the mediator variables become the predictors to the dependent variable life satisfaction, it shows that the mediating effect works well. The objective characteristic of the registered number of accidents per 1,000 inhabitants affects life satisfaction significantly. The domain satisfaction influences subjective wellbeing- life satisfaction respectively including the perception of the resident who finds that nearby children have little traffic problem in negative sign and the perception of the resident who find that nearby children can cross safely on the street in positive sign.

The fourth equation tells that domain satisfaction that says that nearby children have little traffic problem points to negative direction as well. However, since the domain satisfaction that says nearby children have traffic problem in negative sign to the life satisfaction, it cannot be supported by any theory thus the equation model 3 and 4 cannot be accepted. Therefore, equation 2 is chosen as the best suitable regression for route domain in terms of traffic safety since the report of number of traffic accident directly affects the life satisfaction of the neighbourhood in positive ways without mediating effect. It can be said that the better the number of traffic accident report, the better the life satisfaction of the residents.

Personal attributes including gender, age, income, and ethnicity as the control variables to life satisfaction shows similar results with the school domain inferential analysis in sub chapter 4.3.1., while the household composition fails to affect life satisfaction of respondents. First, being a woman has the probability to increase of life satisfaction in positive direction. Second, being a children (<18 years old) has the probability to increase the life satisfaction significantly. Third, in terms of income, the increase of the income level of groups below 1,500 Euro per month has the probability to decrease the life satisfaction significantly. While increase of income in the group within 2000 to 3,350 Euro per month has the probability to increase the life satisfaction respectively. Fourth, the ethnicity background findings show that being a Suriname and other non-western have the probability to decrease the life satisfaction. Also, being a Moroccan and Cape Verde have the probability to decrease the life satisfaction as well.

The marginal effect conducted in this research is the one that shows extreme value, the least satisfied group. The finding shows that the better number of traffic accidents per 1,000 inhabitant, in this case, decreasing the number of accidents, has the probability to become in the higher group by 0.02% respectively.

Table 9: The Route domain – traffic safety inferential analysis

VARIABLES	(1) TrafficRDMV	**(2)** LifeSatisfaction	(3) LifeSatisfaction	(4) LifeSatisfaction
%ofHomewithinPotentialTraffic	5.488***	-0.00636	0.323	
	(0.113)	(0.171)	(0.228)	
%ofHomewithBarrierFreeRoute	-0.697***	-0.0448	-0.0482	
	(0.0478)	(0.0749)	(0.0768)	
NumberofTrafficAccidentper1,000 inhabitant	-0.0268***	-0.00472**	-0.00467**	
	(0.00121)	(0.00205)	(0.00216)	
FindsthatNearbyChildhaveLitlTrafficProblem			-0.996***	-0.766**
			(0.372)	(0.320)
FindsthatChildcanCrossSafelyinPlacesNearby			0.948**	0.496
			(0.462)	(0.439)
FindsthatNearbyChildcanSafelyRideonthe Street			-0.143	0.156
			(0.410)	(0.391)
_Igender_1		0.0926***	0.0917***	0.0903***
		(0.0343)	(0.0343)	(0.0342)
_Ihousehold_1		0.0249	0.0308	0.0334
		(0.0861)	(0.0861)	(0.0860)
_Ihousehold_2		-0.0818	-0.0763	-0.0805
		(0.0976)	(0.0976)	(0.0975)
_Ihousehold_3		-0.00117	-0.00258	-0.000944
		(0.0861)	(0.0861)	(0.0860)
_Ihousehold_4		0.00994	0.00390	0.00734
		(0.0873)	(0.0873)	(0.0872)
_Ihousehold_5		0.0658	0.0649	0.0724
		(0.138)	(0.139)	(0.139)
_Ihousehold_6		-0.370	-0.414	-0.391
		(0.465)	(0.466)	(0.465)
_Iage_1		0.247***	0.252***	0.250***
		(0.0789)	(0.0789)	(0.0788)
_Iincome_1		-0.290***	-0.288***	-0.289***

		(0.0828)	(0.0828)	(0.0828)
_Iincome_2		-0.161*	-0.160*	-0.161*
		(0.0852)	(0.0853)	(0.0853)
_Iincome_3		0.0964	0.101	0.101
		(0.0845)	(0.0845)	(0.0844)
_Iincome_4		0.136*	0.141*	0.139*
		(0.0816)	(0.0816)	(0.0815)
_Iincome_5		0.0583	0.0633	0.0649
		(0.0843)	(0.0844)	(0.0841)
_Iethnicity_2		-0.327***	-0.330***	-0.330***
		(0.0629)	(0.0633)	(0.0630)
_Iethnicity_3		-0.108**	-0.117**	-0.117**
		(0.0508)	(0.0520)	(0.0514)
_Iethnicity_4		-0.113	-0.119	-0.119
		(0.0824)	(0.0826)	(0.0823)
_Iethnicity_5		-0.105	-0.113	-0.112
		(0.0713)	(0.0716)	(0.0715)
_Iethnicity_6		-0.237***	-0.250***	-0.247***
		(0.0911)	(0.0921)	(0.0918)
_Iethnicity_7		-0.0655	-0.0816	-0.0708
		(0.117)	(0.118)	(0.117)
_Iethnicity_8		-0.449***	-0.453***	-0.450***
		(0.0993)	(0.0996)	(0.0994)
_Iethnicity_9		-0.213**	-0.225**	-0.223**
		(0.0983)	(0.0992)	(0.0987)
Constant cut1		-2.184***	-1.958***	-2.165***
		(0.201)	(0.245)	(0.186)
Constant cut2		-1.129***	-0.902***	-1.110***
		(0.198)	(0.242)	(0.183)
Constant cut3		-0.353*	-0.125	-0.333*
		(0.197)	(0.242)	(0.182)
Constant	-4.200***			
	(0.108)			
Observations	5,288	5,047	5,047	5,055
R-squared	0.352			
Pseudo R-squared		0.0212	0.022	0.021

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Author, 2017

The structure of the street in the city of Rotterdam can be seen in figure 19. It shows that the more dense the street the higher the development of the area. Based on the data, the population also gathered around the well-structured street neighbourhood. On the other hand, in figure 20 when the structure of the street map is overlaid by the life satisfaction map, it shows that the well-developed street does not guarantee the higher level of life satisfaction. Therefore, the physical provision of streets, pedestrian pathways, bicycle lanes, and public transit hub only may not affects the life satisfaction.

To sum up, in table 10, the reported number of traffic accidents per 1,000 inhabitants significantly influences subjective wellbeing - life satisfaction directly without intermediation.

Table 10: The route domain - traffic safety that significantly affect subjective well-being

Subjective well-being	Subjective characteristics	Objective characteristics
Life satisfaction	**Children Domain satisfaction**	**Route Domain**
	No mediating effect	Number of traffic accidents per 1,000 inhabitant report (-)

Source: Author, 2017

Safety route in term of social safety is investigated through the equations in table 11. The analysis shows that social safety indicator, the reported number of violence crime per 1,000 inhabitants, significantly affects the subjective wellbeing – life satisfaction of the resident. It can be said that the better report on the number of violence crime per 1,000 inhabitants has the probability to increase the level of subjective wellbeing of the resident.

The first equation shows that the independent variable affect the mediator, the domain satisfaction in negative way. As an attempt to test that the indirect effect exist or not, this model is not applied. In the third and the fourth equation, it can be explained that the mediating variable has no effect to life satisfaction.

Therefore, although in a very low magnitude, the second model is chosen as the best suitable model for social safety route domain directly, without mediator. The control variables for the dependent variable life satisfaction findings shows that first, being a woman has the probability to increase of life satisfaction in positive direction. Second, being a children (<18 years old) has the probability to increase the life satisfaction significantly. Third, in terms of income, the income increase of income in the groups below 1,500 Euro per month have the probability to decrease the life satisfaction significantly. This can be explained that the better the income may change the social benefit that the respondents in this group of income received from the government. While the increase of income in the group within 2000 to 3,350 Euro per month has the probability to increase the life satisfaction respectively. Fourth, the ethnicity background findings show that being a Suriname and other non-western have the probability to decrease the life satisfaction. Also, being a Moroccan and Cape Verde have the probability to decrease the life satisfaction as well. There is no significant contribution to life satisfaction found on the type of household.

The marginal effect in table 11 shows that when the least satisfy as the reference group, reducing the number of violence crime per 1,000 inhabitants will increase the probability of satisfaction level in the lowest group by 0.02%. It shows that the mediating variable, the perception of the resident of feeling insecure, plays more significant role to determine subjective wellbeing – the life satisfaction.

Table 11: The route domain – Social safety inferential analysis

VARIABLES	(1) SocialRDMV	(2) LifeSatisfaction	(3) LifeSatisfaction	(4) LifeSatisfaction
Number of violence crime per 1,000 inhabitant	-6.77e-06**	-0.000306**	-0.000298**	
	(3.14e-06)	(0.000131)	(0.000131)	
Perception of feeling insecure			-0.816	-0.874
			(0.588)	(0.588)
_Igender_1		0.0924***	0.0914***	0.0908***
		(0.0342)	(0.0342)	(0.0342)
_Ihousehold_1		0.0345	0.0353	0.0299

		(0.0860)	(0.0860)	(0.0860)
_Ihousehold_2		-0.0826	-0.0810	-0.0844
		(0.0975)	(0.0975)	(0.0975)
_Ihousehold_3		-0.00244	-0.00292	-0.000710
		(0.0861)	(0.0861)	(0.0861)
_Ihousehold_4		0.00687	0.00591	0.0122
		(0.0873)	(0.0872)	(0.0872)
_Ihousehold_5		0.0663	0.0628	0.0713
		(0.138)	(0.138)	(0.138)
_Ihousehold_6		-0.394	-0.389	-0.355
		(0.467)	(0.466)	(0.464)
_Iage_1		0.252***	0.250***	0.246***
		(0.0787)	(0.0788)	(0.0787)
_Iincome_1		-0.288***	-0.284***	-0.287***
		(0.0827)	(0.0827)	(0.0827)
_Iincome_2		-0.159*	-0.154*	-0.157*
		(0.0852)	(0.0853)	(0.0853)
_Iincome_3		0.103	0.105	0.100
		(0.0844)	(0.0844)	(0.0844)
_Iincome_4		0.137*	0.135*	0.136*
		(0.0815)	(0.0815)	(0.0816)
_Iincome_5		0.0656	0.0564	0.0600
		(0.0840)	(0.0842)	(0.0842)
_Iethnicity_2		-0.337***	-0.324***	-0.317***
		(0.0626)	(0.0633)	(0.0633)
_Iethnicity_3		-0.121**	-0.108**	-0.0966*
		(0.0505)	(0.0514)	(0.0511)
_Iethnicity_4		-0.127	-0.126	-0.112
		(0.0823)	(0.0823)	(0.0821)
_Iethnicity_5		-0.110	-0.105	-0.0977
		(0.0711)	(0.0712)	(0.0711)
_Iethnicity_6		-0.257***	-0.240***	-0.222**
		(0.0913)	(0.0921)	(0.0916)
_Iethnicity_7		-0.0860	-0.0738	-0.0526
		(0.117)	(0.118)	(0.117)
_Iethnicity_8		-0.458***	-0.450***	-0.441***
		(0.0994)	(0.0995)	(0.0994)
_Iethnicity_9		-0.230**	-0.213**	-0.200**
		(0.0981)	(0.0988)	(0.0986)
Perception of feeling insecure			-0.816	-0.874
			(0.588)	(0.588)
Constant cut1		-2.109***	-2.146***	-2.201***
		(0.115)	(0.118)	(0.116)
Constant cut2		-1.054***	-1.091***	-1.146***
		(0.109)	(0.112)	(0.110)
Constant cut3		-0.278**	-0.314***	-0.370***
		(0.108)	(0.112)	(0.109)
Constant	0.0488***			
	(0.000741)			

Observations	5,296	5,055	5,055	5,055
R-squared	0.001			
Pseudo R-squared		0.0209	0.0211	0.0206

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author, 2017

To sum up, in table 12, the route domain in term of social safety inferential analysis shows that number of violence crime per 1,000 inhabitants report affects life satisfaction directly without mediating effect. In other words, the better the report of number of violence crime per 1,000 inhabitant, the better the life satisfaction.

Table 12: The route domain - social safety that significantly affect subjective well-being

Subjective well-being	Subjective characteristics	Objective characteristics
Life satisfaction	**Children Domain satisfaction**	**Route Domain**
	No mediating effect	Report of number of violence crime per 1,000 inhabitant (-)

Source: Author, 2017

The provision of pedestrian pathway, bicycle lane, and transit hub accessibility is the third group in the inferential analysis under the route domain as seen in table 13. The findings from inferential analysis in the first model show that the availability of pedestrian area and transit hub within walking distance affect the resident satisfaction on the domain satisfaction how the area suitable for children in three different age group, 0-4 years old, 4 to 13 years old, and 13 to 18 years old, significantly in negative direction. The second model shows that only the availability of pedestrian area that influences the subjective wellbeing – life satisfaction as the dependent variable, significantly with the p-value <0.005. The direction is positive, which means that the increase of the total area of pedestrian area per residential area has the probability to increase the residents' life satisfaction. It can be seen in the third model that availability of pedestrian pathway also significantly affect the subjective wellbeing – life satisfaction in positive direction significantly. While the mediator, the domain satisfaction does not affect life satisfaction and this means that there is no mediating effect applies. Fourth, the inferential analysis shows that the mediator, satisfaction that the area is suitable for children age 4 to 13 years old affects life satisfaction significantly in negative direction. The latest regression cannot be accepted since it cannot be explain further by logical reason.

In this series of regression model, the direct path in model 2 is the best suitable model and proof that there is no mediating effect applies. Personal attributes including gender, age, income, and ethnicity as the control variables to life satisfaction shows significant influence to life satisfaction, while the household composition fails to affect life satisfaction of the respondents. The finding shows that, first, being a woman has the probability to increase of life satisfaction in positive direction. Second, being a children (<18 years old) has the probability to increase the life satisfaction significantly. Third, in terms of income, the increase of income in the income level below 1,500 Euro per month have the probability to decrease the life satisfaction significantly. Fourth, the ethnicity background findings show that being a Suriname and other non-western have the probability to decrease the life satisfaction. Also, being a Moroccan and Cape Verde have the probability to decrease the life satisfaction as well.

The marginal effect can be seen in table 22 in annex 6, shows that in the least satisfaction group, the increase of availability of pedestrian area in 1%, has probability to increase one unit of life satisfaction.

Table 13: The route domain – physical provision inferential analysis

VARIABLES	(1) DomainSatisfaction	**(2)** LifeSatisfaction	(3) LifeSatisfaction	(4) LifeSatisfaction
Pedestrian pathway avail	-1.302***	0.227**	0.210*	
	(0.0809)	(0.114)	(0.118)	
Bicycle route avail	-8.93e-08	-2.01e-08	-2.06e-08	
	(7.40e-08)	(1.04e-07)	(1.04e-07)	
Transit hub within walking distance	-0.761***	0.00262	-0.00525	
	(0.0312)	(0.0437)	(0.0457)	
GDMV			-0.0120	
			(0.0203)	
SatisfiedtheAreaSuitablefor0to4				0.560
				(0.392)
SatisfiedtheAreaSuitablefor4to13				-0.707**
				(0.344)
SatisfiedtheAreaSuitablefor13to18				0.123
_Igender_1		0.0919***	0.0923***	0.0922***
		(0.0342)	(0.0342)	(0.0342)
_Ihousehold_1		0.0349	0.0364	0.0398
		(0.0861)	(0.0861)	(0.0862)
_Ihousehold_2		-0.0844	-0.0839	-0.0816
		(0.0975)	(0.0975)	(0.0975)
_Ihousehold_3		-0.00366	-0.00338	-0.00176
		(0.0861)	(0.0861)	(0.0861)
_Ihousehold_4		0.00725	0.00721	0.00700
		(0.0873)	(0.0873)	(0.0873)
_Ihousehold_5		0.0663	0.0656	0.0634
		(0.139)	(0.139)	(0.138)
_Ihousehold_6		-0.379	-0.381	-0.371
		(0.466)	(0.466)	(0.465)
_Iage_1		0.248***	0.249***	0.249***
		(0.0788)	(0.0788)	(0.0787)
_Iincome_1		-0.289***	-0.291***	-0.290***
		(0.0827)	(0.0828)	(0.0828)
_Iincome_2		-0.159*	-0.161*	-0.161*
		(0.0852)	(0.0853)	(0.0853)
_Iincome_3		0.100	0.100	0.0988
		(0.0844)	(0.0844)	(0.0844)
_Iincome_4		0.134	0.134*	0.132
		(0.0816)	(0.0816)	(0.0816)
_Iincome_5		0.0590	0.0619	0.0546
		(0.0843)	(0.0844)	(0.0844)
_Iethnicity_2		-0.331***	-0.337***	-0.332***
		(0.0627)	(0.0635)	(0.0636)
_Iethnicity_3		-0.113**	-0.119**	-0.121**
		(0.0508)	(0.0518)	(0.0518)

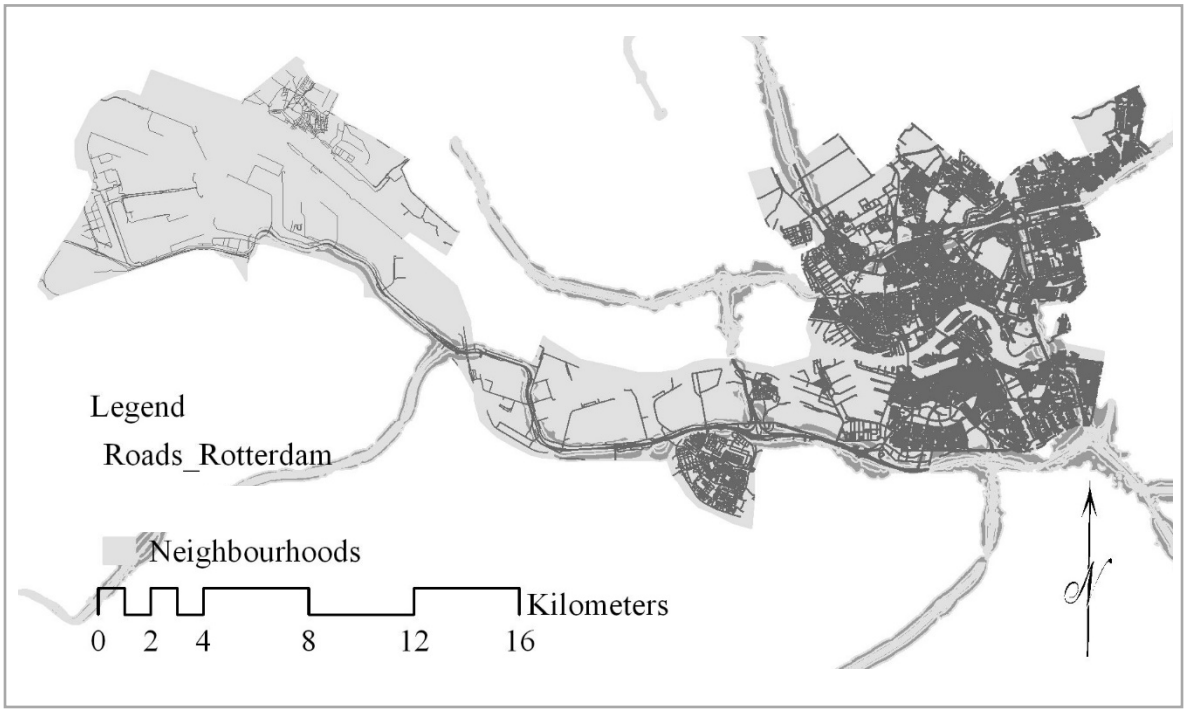
_Iethnicity_4		-0.124	-0.127	-0.127
		(0.0823)	(0.0825)	(0.0825)
_Iethnicity_5		-0.104	-0.109	-0.112
		(0.0711)	(0.0715)	(0.0715)
_Iethnicity_6		-0.249***	-0.257***	-0.253***
		(0.0912)	(0.0922)	(0.0923)
_Iethnicity_7		-0.0784	-0.0840	-0.0773
		(0.117)	(0.118)	(0.118)
_Iethnicity_8		-0.455***	-0.459***	-0.454***
		(0.0993)	(0.0996)	(0.0996)
_Iethnicity_9		-0.222**	-0.229**	-0.228**
		(0.0988)	(0.0994)	(0.0991)
				(0.269)
Constant cut1		-2.158***	-2.168***	-2.196***
		(0.224)	(0.225)	(0.188)
Constant cut2		-1.103***	-1.113***	-1.140***
		(0.222)	(0.222)	(0.185)
Constant cut3		-0.326	-0.336	-0.363**
		(0.221)	(0.222)	(0.184)
Constant	0.784***			
	(0.140)			
Observations	5,296	5,055	5,055	5,055
R-squared	0.218			
Pseudo R-squared		0.0208	0.0205	0.0209

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Author, 2017

The structure of the street in the city of Rotterdam can be seen in figure 19 done by arc GIS. It shows that the more dense the street the higher the development of the area. Based on the data, the population also is cumulated around the well-structured neighbourhood, which is around the central, in the western part of Rotterdam, north and south of the Maas River.

Figure 19: The road structure where pedestrian pathway, bicycle lane and public transport line are integrated in Rotterdam



Source: Author, 2017

The spatial analysis in figure 20 shows the distribution of the streets including the pedestrian pathways and bicycle route in the city of Rotterdam, conducted by arc GIS. The map is overlaid to the graduation of life satisfaction map from the least satisfied group (1) to the most satisfied group (4). It shows that the well-developed street does not guarantee the higher level of life satisfaction. It can be said that the physical provision, the availability of streets, pedestrian pathways, bicycle lanes, and public transit hub only may not relate to the life satisfaction. Furthermore, investigation should be put in detail, in the neighbourhood level, to see how separation of pedestrian pathway, bicycle lane and the street are conducted to minimise the conflict. Thus the route domain satisfaction is better measured in a more detail and practical approach in the level of neighbourhood.

Figure 20: Road structure map overlays onto the graduation map of life satisfaction in Rotterdam

Source: Author, 2017

To sum up, in the physical provision under the route domain, the availability of pedestrian pathway significantly affects subjective wellbeing in positive direction (table 14).

Table 14: The route domain – pedestrian, bicycle lane availability, and transit hub accessibility that significantly affect subjective well-being

Subjective well-being	**Subjective characteristics**	**Objective characteristics**
Life satisfaction	**Children Domain satisfaction**	**Route Domain**
	No mediating effect	Pedestrian pathway availability (+)

Source: Author, 2017

The qualitative findings show that there is divergence occur from the perception of a respondents from two different neighbourhood. A female architect in her early forty who lives in Katendrecht, as part of the Rotterdam's nine promising neighbourhood 2014-2018, said as follow:

> "The children (age 10 and 7 years old) are safe to walk or to cycle from home to school. The route crosses two streets with a very slow speed limit and passes the main open space of the neighbourhood, where there is park and playgrounds" (A mother of two young children from Katendrecht, 42 years old, Dutch, and neighbourhood activist).

On the other hand, a textile business owner from Afrikanderwijk, a neighbourhood that are not part of the Rotterdam's nine promising neighbourhood 2014-2018, said:

> "My children are under adult supervision whenever out from home, whether they are going to school or to sport and recreation in the weekend because I don't feel it safe for them to go around by themselves" (56 years old male Pakistani, parents of three school aged children, Afrikanderwijk resident).

The two contrast perceptions on safety in terms of the feeling insecurity in the neighborhood of the resident in the same city shows that differences in domain satisfaction also affects the differences on the average score of the subjective wellbeing – life satisfaction in the neighborhood. The two contrast perception also implies both insecurity feeling on traffic and

insecurity feeling on the presence of the "strangers'danger" that relate with the independent mobility research (Hillman, Adams, et al., 1990). From the neighbourhood planning theory, the empirical analysis also shows that indices that may significantly important to subjective wellbeing of the resident include not only safety from traffic but also safety in term of social misbehave. Also indices that are necessary to be included as the domain satisfaction of the neighbourhood in term of traffic safety and social safety brought by Li and Brown (1980), Song and Knaap (2003, 2004b), Grogan-Kaylor et al. (2007), Hur, Nasar, and Chun (2008), Yang (2008), and Hipp (2010) under the boundary of geography measurement (Park and Rogers, 2015).

The findings show the important role of planning, as has been seen, the route domain that allows the children's journey from home to school and from home to public amenities, accounts for more than half of the children's mobility (Hillman, Adams, et al., 1990). The planning decisions affects shared schools and public amenities proximity from home for the children may encourage walking or cycling not only because it promotes children independent mobility, but also walking and cycling are considered as the most environment friendly travelling form. Furthermore, it provides opportunity for children to have healthy exercise in daily life.

On the other hand, the divergence perception of parents on social safety should also be paid into attention. Whether the children are allowed to walk to schools or to public amenities by themselves dependent on the parent's level of feeling insecure in the neighbourhood. The possible appearance of the stranger danger that is known as a massive warning for children not to trust strangers in Leeds back in 1988 (Hillman, Adams, et al., 1990) aim to build children awareness when travelling independently in the route domain. While at the same time in the same publication, the independent mobility is promoted massively. Later, there is still an attempt to include the independent mobility as one of the indicator of a child friendly city.

Moreover, the children participation in designing their own safe route to school can also play important role in building the children awareness on their own safety in the route domain. Concerning traffic safety, escorting children may come into solution and it can be done collectively in groups. This neighbourhood activities promote social cohesion since everyone is included regardless ethnicity backgrounds, household incomes and other obstacles. Nevertheless, the adult supervision in the route domain may fade for the children in their youth age when they have access to cars and motorcycles.

4.3.3. The public amenities domain and subjective wellbeing

Public amenities domain inferential analysis is conducted in two series. First, to examine how the park and playground affect subjective wellbeing and second, covers the sport, recreation and culture facilities, general practice or clinic, and childcare availability and accessibility.

The first inferential analysis group is to examine the relationship between the public amenities domain - park and playgrounds with subjective wellbeing – life satisfaction. Table 15 consists of four different model to foresee which indicators from the public amenities domain, the availability and accessibility of park and playground affect subjective wellbeing significantly. The regression result with 95% confidence interval and number of observation 5,055, shows that percentage of a shared playground within walking distance significantly affect subjective wellbeing – life satisfaction through the mediating variable. The mediating indicators include domain satisfaction of resident who finds that the area is suitable for children in different age groups, 0 to 4 years old, 4 to 13 years old, and 13 to 18 years old. The other independent variables including shared open space within walking distance, shared city-park within walking

distance, and shared of *duim* drop location within walking distance do affect the domain satisfaction significantly but fail to affect the subjective wellbeing – life satisfaction respectively. The finding shows that the increase of the availability of park and playground within walking distance significantly influence the subjective wellbeing – life satisfaction, in negative direction. The model that is best represent the relation between public amenities domain to subjective wellbeing is model 3 where the mediating effect occur in the form of complement the relation.

The control variables that predict subjective wellbeing – life satisfaction including gender, age, income, and ethnicity shows significant influence to life satisfaction, while the household composition does not affect life satisfaction of the respondents. The finding shows that, first, being a woman has the probability to increase of life satisfaction in positive direction. Second, being a children (<18 years old) has the probability to increase the life satisfaction significantly. There is no influence of the type of household on subjective wellbeing - life satisfaction. Third, in terms of income, the decrease of income in groups below 1,500 Euro per month have the probability to increase of the life satisfaction significantly. While the increase of income in the group within 2000 to 3,350 Euro per month has the probability to increase the life satisfaction respectively. Fourth, the ethnicity background findings show that being a Suriname and other non-western have the probability to decrease the life satisfaction. Also, being a Moroccan and Cape Verde have the probability to decrease the life satisfaction as well.

On the other way, the marginal effect analysis shows that in the least satisfaction group, the increase of availability and accessibility to park and playground within walking distance of 0.7% may increase one unit of the life satisfaction group (table 23, annex6). In the higher group of life satisfaction or the more satisfied and the most satisfied group, the sign shows in different way. This means in the higher satisfied group, the increase of availability and accessibility to parks and playgrounds have the probability to be in the lower group of life satisfaction. This findings are more investigated in terms of qualitative analysis after the quantitative summary of public amenities domain and subjective wellbeing in this chapter.

Table 15: The public amenities domain – park and playgrounds

VARIABLES	(1) DomainSatisfaction	(2) LifeSatisfaction	**(3) LifeSatisfaction**	(4) LifeSatisfaction
ShareofResidentwPublicOS<250m	0.983***	0.0595	0.100	
	(0.0388)	(0.0725)	(0.0767)	
%ofHomeswPlaygroundre_328m	-1.036***	-0.119*	-0.160**	
	(0.0369)	(0.0724)	(0.0767)	
%ofHomesw500mtoaCityPark	0.718***	-0.0788	-0.0472	
	(0.0301)	(0.0569)	(0.0601)	
%ofhomeswshortdistTOS/duimdropLoc	-1.042***	0.0132	-0.0288	
	(0.0224)	(0.0432)	(0.0502)	
GDMV			-0.0431*	
			(0.0262)	
SatisfiedtheAreaSuitablefor0to4				0.560
				(0.392)
SatisfiedtheAreaSuitablefor4to13				-0.707**
				(0.344)
SatisfiedtheAreaSuitablefor13to18				0.123
				(0.269)

_Igender_1	0.0924***	0.0929***	0.0922***
	(0.0342)	(0.0343)	(0.0342)
_Ihousehold_1	0.0312	0.0335	0.0398
	(0.0862)	(0.0862)	(0.0862)
_Ihousehold_2	-0.0846	-0.0850	-0.0816
	(0.0975)	(0.0975)	(0.0975)
_Ihousehold_3	-0.000191	-0.00255	-0.00176
	(0.0861)	(0.0861)	(0.0861)
_Ihousehold_4	0.0118	0.00947	0.00700
	(0.0873)	(0.0873)	(0.0873)
_Ihousehold_5	0.0682	0.0661	0.0634
	(0.138)	(0.138)	(0.138)
_Ihousehold_6	-0.377	-0.388	-0.371
	(0.465)	(0.466)	(0.465)
_Iage_1	0.248***	0.251***	0.249***
	(0.0787)	(0.0788)	(0.0787)
_Iincome_1	-0.286***	-0.287***	-0.290***
	(0.0828)	(0.0828)	(0.0828)
_Iincome_2	-0.158*	-0.159*	-0.161*
	(0.0853)	(0.0853)	(0.0853)
_Iincome_3	0.102	0.103	0.0988
	(0.0844)	(0.0844)	(0.0844)
_Iincome_4	0.134*	0.136*	0.132
	(0.0816)	(0.0816)	(0.0816)
_Iincome_5	0.0573	0.0630	0.0546
	(0.0842)	(0.0843)	(0.0844)
_Iethnicity_2	-0.324***	-0.331***	-0.332***
	(0.0636)	(0.0637)	(0.0636)
_Iethnicity_3	-0.110**	-0.113**	-0.121**
	(0.0525)	(0.0526)	(0.0518)
_Iethnicity_4	-0.116	-0.122	-0.127
	(0.0824)	(0.0825)	(0.0825)
_Iethnicity_5	-0.103	-0.109	-0.112
	(0.0714)	(0.0715)	(0.0715)
_Iethnicity_6	-0.231**	-0.246***	-0.253***
	(0.0920)	(0.0925)	(0.0923)
_Iethnicity_7	-0.0588	-0.0703	-0.0773
	(0.117)	(0.118)	(0.118)
_Iethnicity_8	-0.440***	-0.448***	-0.454***
	(0.0995)	(0.0997)	(0.0996)
_Iethnicity_9	-0.212**	-0.218**	-0.228**
	(0.0995)	(0.0996)	(0.0991)
			(0.269)
Constant cut1	-2.247***	-2.258***	-2.196***
	(0.130)	(0.130)	(0.188)
Constant cut2	-1.192***	-1.203***	-1.140***
	(0.124)	(0.125)	(0.185)
Constant cut3	-0.416***	-0.426***	-0.363**
	(0.124)	(0.124)	(0.184)
Constant	0.274***		

	(0.0356)			
Observations	5,296	5,055	5,055	5,055
R-squared	0.570			
Pseudo R-squared		0.0208	0.0211	0.0209

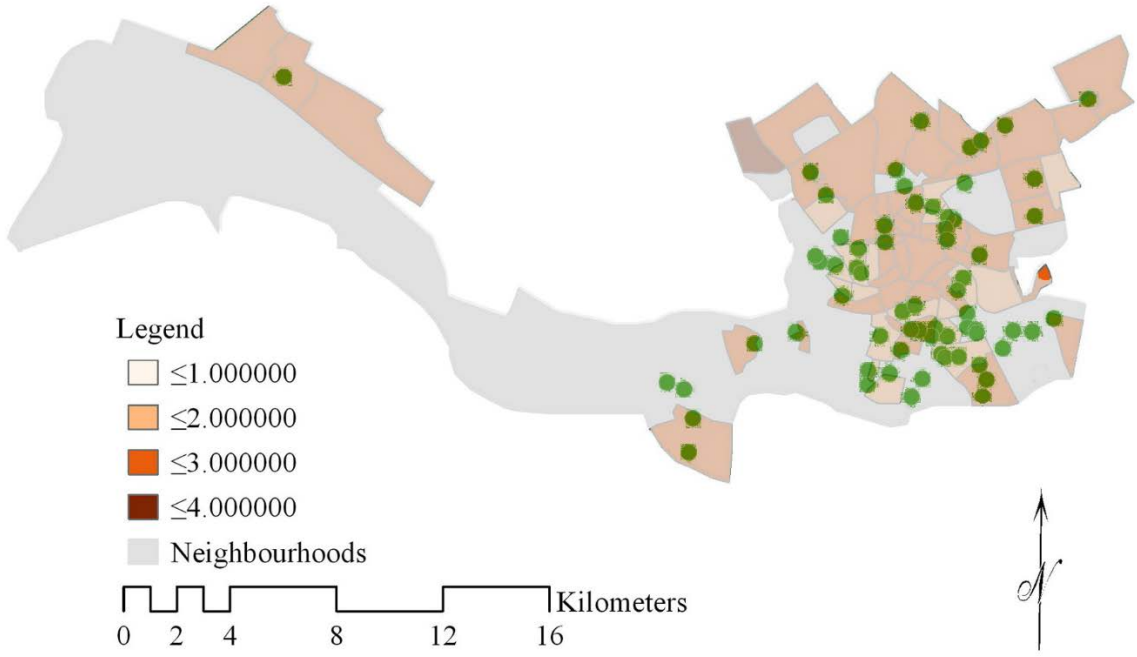
Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author, 2017

The spatial analysis in figure 21 shows the distribution of park and playgrounds (the green dots) in the city of Rotterdam, conducted by arc GIS. The map is overlaid to the graduation of life satisfaction map from the least satisfied group (1) to the most satisfied group (4). It can be seen that the distribution of the parks and playgrounds in the mediocre area of life satisfaction or in the group 2 and 3 of life satisfaction. The parks and playgrounds are scattered in several neighbourhoods around the city centre. Some neighbourhood can be seen as not supplied by parks and playgrounds such as in Zestienhoven, Schieveen, Noord-Kethel, Rijnpoort and Strand en Duin. While other neighbourhoods are supplied by parks and playgrounds.

Figure 21: Parks and playgrounds distribution map is overlaid onto graduation subjective wellbeing distribution map in Rotterdam



Source: Author, 2017

The second inferential analysis under the public amenities domain covers the availability and accessibility of health facility including clinic, sport, culture and recreational facilities and child care. It can be seen in table 16, the first model, shared clinic within walking distance significantly affect domain satisfaction. The findings show that the availability of sport, culture and recreational amenities within walking distance, as well as their variant options of several different type of sport, culture, and recreation significantly affects the domain satisfaction, in negative sign. The shared child care within walking distance also influence the domain satisfaction in negative way. In this domain, the domain satisfaction comprises on how satisfied

the resident with the area that perceived to be suitable for children in different age group from 0-4 years old, 4 to 13 years old, and 13 to 18 years old.

The second model, the direct path, where the independent variable, the public amenities domain act to control the dependent variable subjective wellbeing – life satisfaction, the accessibility of the clinic, sport, culture and recreation facilities within walking distance significantly affect subjective wellbeing – life satisfaction, in positive direction with p-value 0.1. The shared child care within walking distance also significantly influence subjective wellbeing – life satisfaction, in negative sign with p-value 0.1. This can be explained that the increase of availability and the accessibility of the sport, culture and recreation facilities within walking distance may increase subjective wellbeing – life satisfaction. While on the other hand, the increase of availability and accessibility of clinic within walking distance has the probability to the decrease of subjective wellbeing – life satisfaction.

The third equation shows that the accessibility of the clinic and sport, culture and recreation facilities within walking distance significantly affect subjective wellbeing – life satisfaction, in positive direction with p-value 0.1. The shared child care within walking distance also significantly influence subjective wellbeing – life satisfaction, in negative sign with p-value 0.1. But, there is no indirect effect applied, since the mediator variable, the domain satisfaction, does not affect the subjective wellbeing respectively.

The fourth equation model shows that the mediator variables, satisfied that finds the area suitable for children ages 4 to 13 years old affects subjective wellbeing significantly, in negative way. This also shows that the mediating variable doesn't perform as the mediator, but there is a competitive effect between domain satisfaction and life satisfaction. In this case, the fourth model cannot be accepted as well.

The best suitable model can be explained in the model 2, where direct effect exists. In other words, the independent variables under the public amenities domain affect subjective wellbeing – life satisfaction directly, without the need of mediator, the domain satisfaction. The personal attributes in the form of control variables that predict subjective wellbeing – life satisfaction including gender, age, income, and ethnicity shows significant influence to life satisfaction, while the household composition does not affect life satisfaction of the respondents. The finding shows that, first, being a woman has the probability to increase of life satisfaction in positive direction. Second, being a children (<18 years old) has the probability to increase the life satisfaction significantly. Third, in terms of income, the decrease of income in groups below 1,500 Euro per month have the probability to increase of the life satisfaction significantly. While the increase of income in the group within 2000 to 3,350 Euro per month has the probability to increase the life satisfaction respectively. Fourth, the ethnicity background findings show that being a Suriname and other non-western have the probability to decrease the life satisfaction. Being a Moroccan and Cape Verde have the probability to decrease the life satisfaction as well.

Table 16: Public amenities domain – clinic, sport/culture/recreational, day-care inferential analysis

VARIABLES	(1) DomainSatisfaction	**(2) LifeSatisfaction**	(3) LifeSatisfaction	(4) LifeSatisfaction
ShareofReswithGPClinicwithinWalkDIst	0.281***	-0.172*	-0.169*	
	(0.0526)	(0.0933)	(0.0938)	
ShareofReswithSportCulRecwithinWalkDist	-0.212***	0.193*	0.192*	
	(0.0667)	(0.115)	(0.115)	
SevDifferentofSportCultRec<1,500m	-0.0270***	0.000250	6.80e-05	

	(0.000695)	(0.00120)	(0.00136)	
ChildcarewithinWalkDist	-0.128***	-0.000896	-0.00169	
	(0.0119)	(0.0204)	(0.0206)	
GDMV			-0.00699	
			(0.0246)	
SatisfiedtheAreaSuitablefor0to4 DS				0.560
				(0.392)
SatisfiedtheAreaSuitablefor4to13 DS				-0.707**
				(0.344)
SatisfiedtheAreaSuitablefor13to18 DS				0.123
_Igender_1		0.0904***	0.0906***	0.0922***
				(0.269)
		(0.0343)	(0.0343)	(0.0342)
_Ihousehold_1		0.0419	0.0427	0.0398
		(0.0862)	(0.0862)	(0.0862)
_Ihousehold_2		-0.0755	-0.0757	-0.0816
		(0.0976)	(0.0976)	(0.0975)
_Ihousehold_3		0.00152	0.00153	-0.00176
		(0.0861)	(0.0861)	(0.0861)
_Ihousehold_4		0.0115	0.0116	0.00700
		(0.0873)	(0.0873)	(0.0873)
_Ihousehold_5		0.0754	0.0745	0.0634
		(0.139)	(0.139)	(0.138)
_Ihousehold_6		-0.377	-0.377	-0.371
		(0.466)	(0.466)	(0.465)
_Iage_1		0.248***	0.248***	0.249***
		(0.0788)	(0.0788)	(0.0787)
_Iincome_1		-0.293***	-0.294***	-0.290***
		(0.0828)	(0.0829)	(0.0828)
_Iincome_2		-0.163*	-0.163*	-0.161*
		(0.0853)	(0.0854)	(0.0853)
_Iincome_3		0.0975	0.0973	0.0988
		(0.0845)	(0.0845)	(0.0844)
_Iincome_4		0.137*	0.137*	0.132
		(0.0816)	(0.0816)	(0.0816)
_Iincome_5		0.0657	0.0666	0.0546
		(0.0841)	(0.0842)	(0.0844)
_Iethnicity_2		-0.326***	-0.328***	-0.332***
		(0.0632)	(0.0639)	(0.0636)
_Iethnicity_3		-0.115**	-0.117**	-0.121**
		(0.0513)	(0.0519)	(0.0518)
_Iethnicity_4		-0.123	-0.125	-0.127
		(0.0823)	(0.0824)	(0.0825)
_Iethnicity_5		-0.111	-0.113	-0.112
		(0.0714)	(0.0715)	(0.0715)
_Iethnicity_6		-0.253***	-0.256***	-0.253***
		(0.0916)	(0.0923)	(0.0923)
_Iethnicity_7		-0.0812	-0.0840	-0.0773
		(0.117)	(0.118)	(0.118)
_Iethnicity_8		-0.449***	-0.450***	-0.454***

		(0.0994)	(0.0996)	(0.0996)
_Iethnicity_9		-0.225**	-0.227**	-0.228**
		(0.0991)	(0.0994)	(0.0991)
Constant cut1		-2.126***	-2.133***	-2.196***
		(0.122)	(0.125)	(0.188)
Constant cut2		-1.071***	-1.078***	-1.140***
		(0.117)	(0.119)	(0.185)
Constant cut3		-0.294**	-0.301**	-0.363**
		(0.116)	(0.119)	(0.184)
Constant	1.062***			
	(0.0297)			
Observations	5,294	5,053	5,053	5,055
R-squared	0.489			
Pseudo R-squared		0.021	0.021	0.0209

Standard errors in parentheses

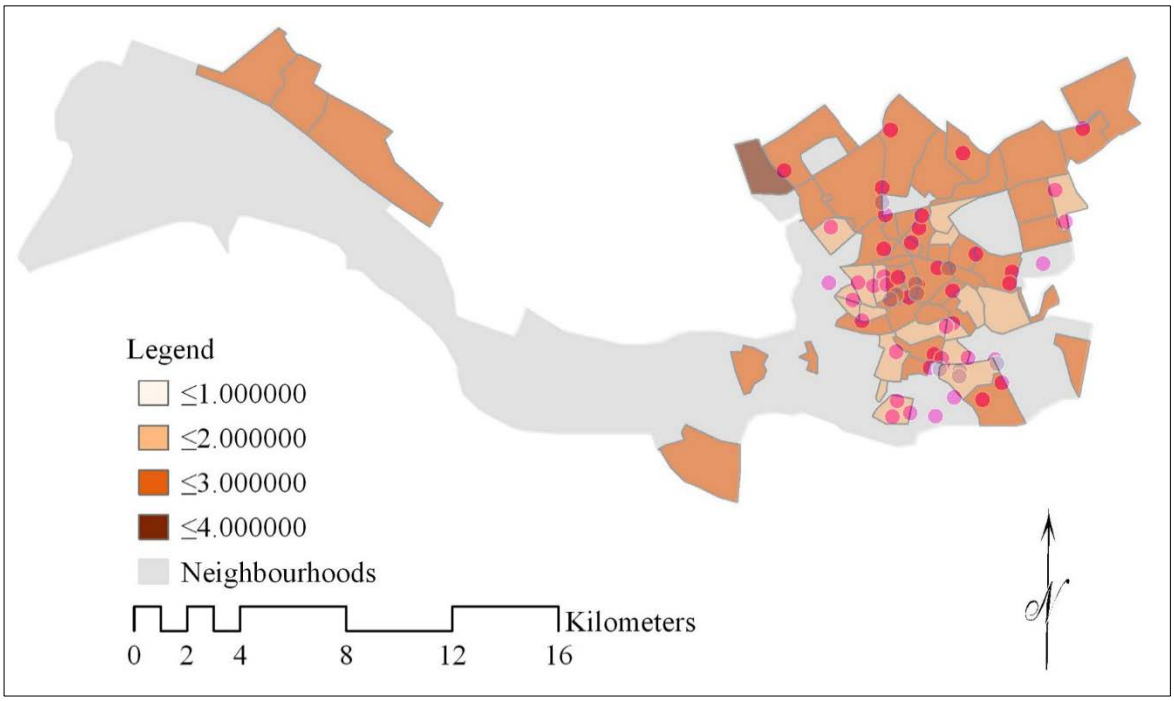
*** p<0.01, ** p<0.05, * p<0.1

Source: Author, 2017

Table 24 in annex 6 shows the result of marginal effect analysis that says that the increase of clinic within walking distance will increase the probability of being in the least satisfy group by 0.7% significantly with standard error of less than 0.1. While the increase of sport, culture, and recreation facilities will increase the probability of being in the most satisfy group by 0.8% significantly. The findings synchronized with the central elements of neighbourhood from the planning theory since Mac Kenzie (1920), Perry (1929), Stein (1942), Engelhart. Jr (1943), Nelson (1945) that constructed neighbourhood unit more than the other recent planning theory, such as new urbanism brought by Calthrope (1993), Duany and Plater-Zyberk (1994), Nelessen (1994), Farr (2007), who placed transit hub and convenience centre as part of central elements of neighbourhood planning as well as primary school and community centre (Park and Rogers, 2015).

A spatial distribution of health facilities including hospital and clinic in Rotterdam done by ArcGIS in figure 22 shows that the distribution is accumulated in the eastern part of Rotterdam. The map is overlaid to the graduation of life satisfaction map from the least satisfied group (1) to the most satisfied group (4). The spatial analysis shows that the distribution of health facilities are on the central to eastern part of the city. The western part of Rotterdam, in the neighbourhood of Strand en Duin, Dorp, and Rijnport, also in Hoogvliet-Zuid, Pernis, and some neighbourhood in the north are not supplied by health facilities. When the distribution of the health facilities map is overlaid to the life satisfaction map, it shows that those neighbourhood belongs to life satisfaction level 3 group or the satisfied group. This finding relates with the predicted regression findings that availability of clinic affect the life satisfaction in negative way. Based on the spatial analysis, it is obvious that the availability and accessibility of clinic within walking distance less likely to have relation with the level of life satisfaction. It is more likely to serve population based on the neighbourhood planning as one of the core elements in the neighbourhood.

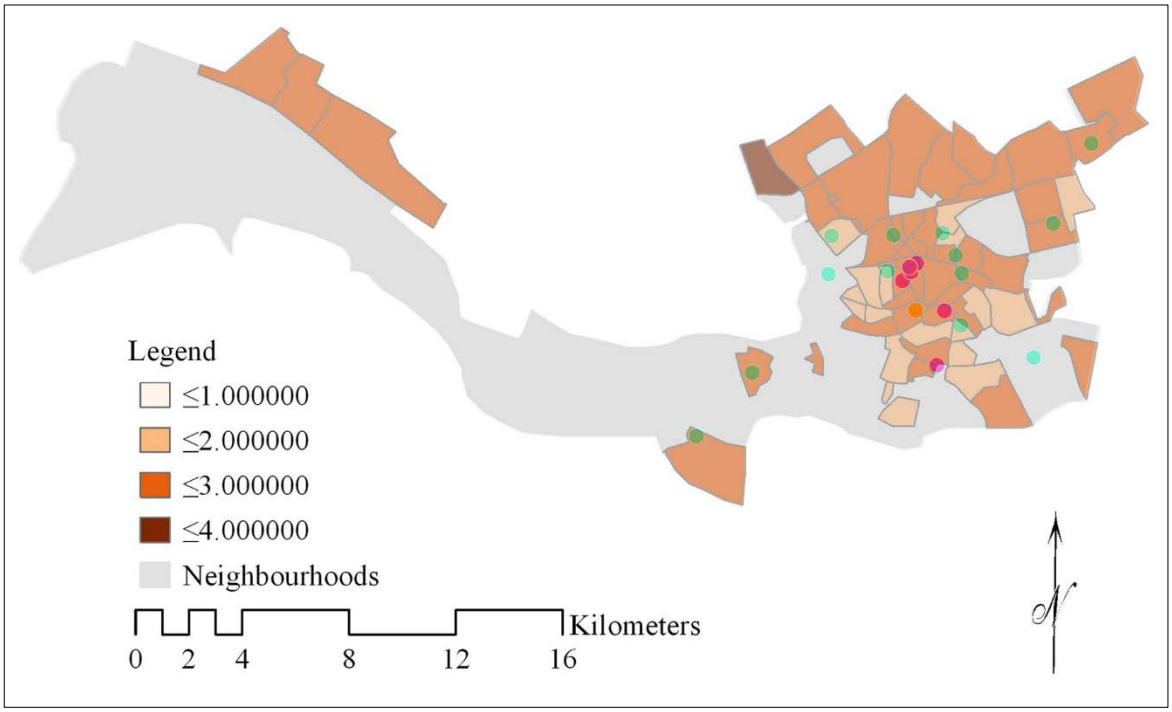
Figure 22: Spatial distribution of healthcare overlays onto subjective wellbeing distribution in Rotterdam



Souce: Author, 2017

A spatial distribution of sport, culture, and recreation amenities in Rotterdam done by ArcGIS in figure 23 shows that the distribution is accumulated in the eastern part of Rotterdam. The map is overlaid to the graduation of life satisfaction map from the least satisfied group (1) to the most satisfied group (4). The map shows the distribution of swimming pools (green), theatres (pink), and museums (orange). It can be seen that the distribution of sport, culture, and recreation facilities are scattered in the neighbourhood that belongs to level 3 of life satisfaction, the satisfy group. Several neighbourhood that belongs to the group 2 of life satisfaction or the less satisfy group, are not supplied with sport, culture, and recreation facilities as can be seen from the map. Neighbourhoods in the eastern part of Rotterdam are also lack of sport, culture, and recreation facilities in the form of swimming pool, theatres and museum. This implies that there are actions to be taken to have a better distribution of sport, culture, and recreation facilities, especially in the area where children existed in the population. Based on these findings, it can be seen that there is a strong relation between the availability of sport, culture, and recreation to the subjective wellbeing – life satisfaction.

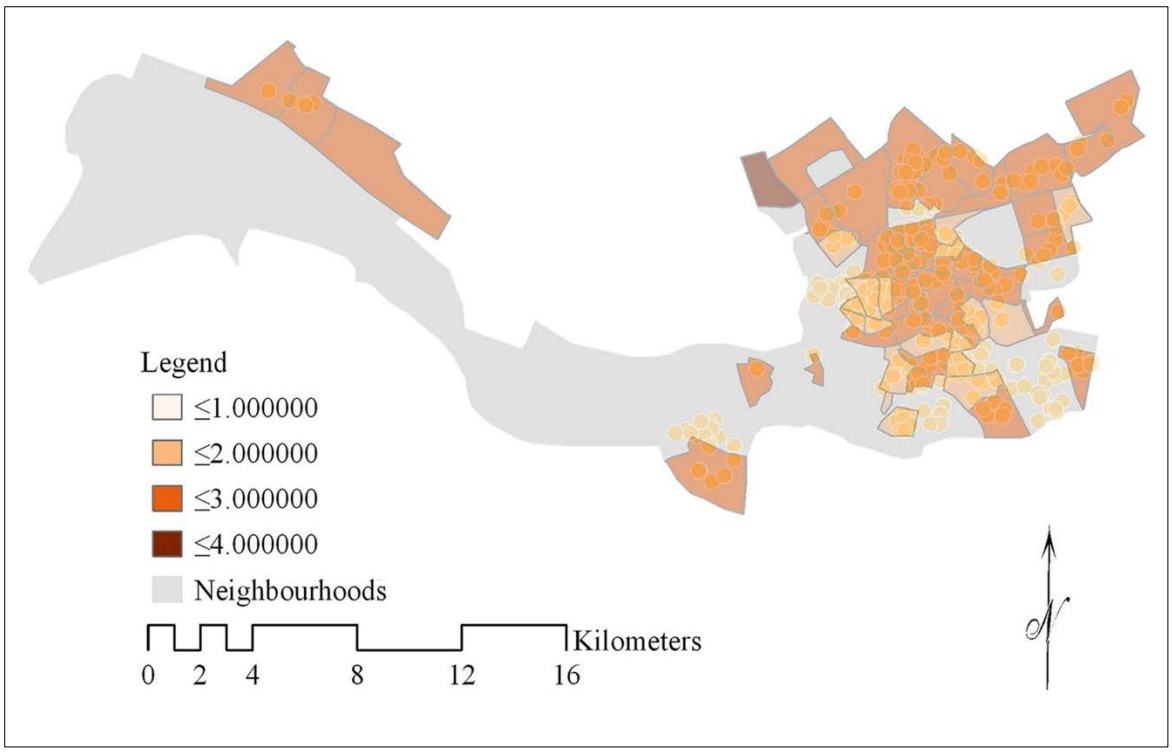
Figure 23: Spatial distribution of sport and culture facilities overlays onto subjective wellbeing distribution in Rotterdam



Souce: Author, 2017

While the spatial distribution of childcare in the city of Rotterdam in figure 24 reflects that the childcare follows the presence of children in the neighbourhood in western part and the eastern part of the city. The map is overlaid to the graduation of life satisfaction map from the least satisfied group (1) to the most satisfied group (4).

Figure 24: Spatial distribution of childcare and its overlay to subjective wellbeing distribution in Rotterdam



Souce: Author, 2017

Table 17 shows the summary of significant indicators of public amenities domain for children that affect subjective wellbeing - life satisfaction. First, the objective characteristics that includes percentage of shared playground within walking distance in negative direction, clinics within walking distance in negative direction, and sport, culture, and recreation within walking distance in positive direction. Second, the domain satisfaction that function as mediator for percentage of shared playground within walking distance is the perception of the residents who find that plenty of playground and park available for each age group.

Table 17: The public amenities domain that significantly affect subjective well-being

Subjective well-being	**Subjective characteristics**	**Objective characteristics**
Life satisfaction	**Children Domain satisfaction**	**Public amenities Domain**
	Satisfied that the area is suitable for different age group (-)	% of playground within walking distance (-)
	No mediating effect applies	General practitioner/clinic within walking distance (-)
	No mediating effect applies	Sport, culture, and recreation facilities within walking distance (+)

Source: Author, 2017

Findings from an array of the inferential analysis of subjective wellbeing – life satisfaction on public amenities domain show that other factor may influence subjective wellbeing when an increase of the availability of park and playgrounds within walking distance affects the probability of decreasing the subjective wellbeing. It implies that the availability of parks and playgrounds in the city of Rotterdam are quite adequate. It also suggests another factor such as the disturbance of the privacy and the view of the area affects the subjective wellbeing. Another factor that should be taken into consideration is the noise problem that may interfere the presence of parks and playgrounds and their proximity from home (Leyden, Goldberg, et al., 2011, Brereton, Clinch, et al., 2008). The noise problem as an indicator relates to statements from two key actors based on the in-depth interview below;

> "The closeness to the playgrounds may disturb the privacy of some people in the neighbourhood. It can be because of the noise or can also be the change of the nuisance" (personal opinion from the Rotterdam municipality).
>
> "In my opinion, those who have a single home with a garden attached as space for children to play in their private home, may not need the public park and playgrounds. While in a more dense population, where space to play is limited, closeness to parks and public playgrounds are more needed." (an architect living in Katendrecht neighbourhood).

Although the recognition of the children needs of spaces in the public realm where children share many commonalities, including lack of child-friendly amenities, frustration, alienation, in unpleasant social environments, these are reflected in both the perception of feeling insecure and the reality of crime. Investment on alternative activities provision is necessary for successful crime prevention, which benefits the entire community and also encompasses social cohesion. This recognition of needs about children domain in the public realm, a diverse range of options, including sports, culture, recreational, and multifunction that do not become the exclusive domain of any single group (Tienda and Wilson, 2002).

In fact, the public amenities may not always free for everyone. It requires some amount of money to enter the facilities. A district policy advisor in Rotterdam mentions about how the better quality of amenities can be affordable only for children from higher income household. On the other hand, certain public facilities that provide activities for children with accessibility for everyone may not be attractive enough for family and children. As a female resident of Rotterdam, a mother of two has said;

> "I rarely go to the library with her children, because there is always something else to do or just staying at home" (A mother of two young children from Katendrecht, Dutch, architect, and neighbourhood activist).

Innovative intervention to attract children and family to be actively engaged in the public amenities is necessary. As the expert says;

> "Children space in the city is necessary as a media to stimulate the children growth. It all started from the child's mother's womb through the age under 18. Starting from the need to be fed up, walking, playing, learning up to the ability to differentiate the good and the not good things" (former president of Child-friendly City European Network).

4.4. Other factors that influence child-friendliness and subjective wellbeing

This sub chapter is an attempt to answer the sub research question 4 - what other factors make child friendliness of a city, and subjective wellbeing differs among neighbourhoods. The children domain in the public realm is based on the spatial implication of the Child's Right Convention as part of the child-friendly city. As can be seen in table 1 in page 19, the author's attempt to investigate spatial implication may seem to be simplified from the complex issue of the Child's Right since many indicators are not included in the operationalization due to certain limitation. Based on the article 9 on the Child's Right Convention, it implies other spatial implication including orphanage and temporary house for children under certain circumstances when detention, imprisonment, exile, deportation or death of one or both parents or of the child care taker.

Furthermore, the spatial implication of article 17 that described the right of children to access the right information includes reading spaces in the neighbourhood, a district library, and the city library, in different scale related with population catchment and proximity from home. Community centre as a place for children to access appropriate information is a potential space to be functioned as cultural and recreational facilities as well. The Child's Right under article 24 on health, includes green open space where plantation and garden perform as the clean air producer in the neighbourhood. On the Child's Right to an adequate standard of living, housing condition is necessary to be included. Moreover, the idea to bring nature to city children refer to health prevention in the same article, as an expert says;

> "Children space production in the city should give room to the children's active movement, involvement in the creation, and greeneries to a healthy environment" (an activist and pedagogic practitioner from *Grun Macht Schule*, Germany).

The article 28 on the right to education, the community centre is also a form of a spatial implication of the Child's Right since it may accommodate vocational study while other option of study after school could also be considered. The article of the right to leisure, play and culture, play space near home, waterfront, and forest are also the spatial implication and factors to determine the child-friendliness of a city. The school playground is essential for the children since it is mostly created from excess space between buildings.

> "The most effective way to make children and youth more conscious and responsible to their surrounding environment, is to give them a chance through their growing-up time to participate in the planning processes and projects that will have a direct and concrete influence on their daily surroundings. This chances to be involved in changing and creating new and better environments should be given to the children on the most

> actual arena: their school!" (A Landscape architect and pedagogic from Environmental Planner with Children and Youth, Norway).

Moreover, the convention promotes the inclusiveness of every child from zero to below 18 with no exceptions. This may include facilities for children with diffability and disability that has certain criteria and standard to be followed in terms of spatial implication. This special accessibility should be facilitated throughout the children domain in the public realm and in the neighbourhood scale.

Based on the *Kindvriendlijk wijk* monitor data there are two measurement of child-friendliness of a city. First, the objective measurement that also covers social aspects such as presence of peers, the family frequent of moving. The presence of family friendly housing also contributes to child-friendliness of a city in terms of physical aspect. Second, the subjective measurement that influence the child-friendliness of a city mostly on social aspect. It includes parenting climate in the form of respect to how parents deal with their children in the neighbourhood, young and adults are doing well in the area, agree with if a child is destroying something or behaving irresponsible, there is a report mechanism. The city also measure if there is always an adult who is watching the children presence outside their home, and warns the children on what they may and may not do. How one trust the older children to watch the younger children, how the younger children struggling with each other, and how older children often do annoying the younger children are also measured. As part of subjective indicators, satisfied with the family housing, satisfied with the home that suitable for a family with two children, satisfied with the quality of playgrounds are also measured as other factors that makes child-friendliness and subjective wellbeing differs between neighbourhoods.

> "Children and youth grow up in an authoritative adult world, where the entire physical environment, everything from the large buildings to the tiniest detail, is characterized by adult planners. Architect and designers have, therefore, a special responsibility when it comes to environments for children and youth. Giving the children's own creative activity and possibilities for influencing their surrounding may bound people regardless their differences" (A Landscape architect and pedagogic from Environmental Planner with Children and Youth, Norway).

Furthermore, based on the e-hero's subjective wellbeing data several measurement are included. It includes on time spent for leisure, optional activities for leisure, various activities on what one can do in spare time such as watching TV, radio, and the internet, sports or a visit to the city of Rotterdam. Moreover, physical exercises such as walking or cycling, gardening, sports, and other physical exercise at school or work, at home are also measured. Appreciation to waterfront is also factor that is considered as contributor to subjective wellbeing. How one walk along the riverbank including by wheelchair and scooter, how one enjoy the view and watch the boat are also counted. It also measure a visit to theater to watch performances, going to concerts, to the cinemas, museums, and festivals. Furthermore, judgement on places in the city is considered as factors that makes subjective wellbeing differs between neighborhoods. Personal attributes are also investigated in measuring subjective wellbeing. Age, household, health condition, personal limitation, education, knowing oneself by describing seven character of oneself, and income.

Chapter 5: Conclusions and recommendations

5.1. Conclusions

Going back to the research questions - how do children domain in the public realm affect the subjective wellbeing (domain satisfaction and life satisfaction) in Rotterdam – findings from the empirical analysis show that in the school domain, number of shared primary school within walking distance, influence domain satisfaction. Also, it directly affects the life satisfaction of the resident. With both positive signs, it can be said that the increase in number of shared primary school within walking distance may increase satisfaction on the perception of how the area is suitable for children age 4 to 13. Thus, it has the probability of increasing life satisfaction of the residence. The findings relate to the neighbourhood planning theoretically, as primary school is one of the central elements of neighbourhood planning, where walking distance proximity from home is plausible (Park and Rogers, 2015).

On the route domain regarding traffic safety, the indicator that significantly affects subjective wellbeing is the report on traffic accidents per 1,000 inhabitants. On the route domain regarding social safety, the registered data on crime or violence affects subjective wellbeing, directly. The finding synchronises with the theory that pinpoint social safety as an indicator of satisfaction to the condition in life. Empirically, social safety is tested as influencing subjective wellbeing (Veenhoven, 1996). The physical provision on the route domain that significantly affects subjective wellbeing directly is the availability of pedestrian pathway. With positive sign in the inferential analysis, the increasing of availability of pedestrian pathway has the probability to the increasing of subjective wellbeing. Thus, the children domain in the public realm, in the route domain, affects subjective wellbeing directly, without intermediary.

The availability and accessibility of public amenities domain that significantly affects subjective wellbeing are proximity to shared park and playground within walking distance. This indicator affects domain satisfaction, satisfied that the neighbourhood is suitable for every age groups, from 0 to 4, 4 to 13, and 13 to 18 years old. Hence, the domain satisfaction affects the life satisfaction. The interesting finding is that the increasing number of shared park and playground that are relatively close to the home has a probability to decrease life satisfaction of the residence. The finding implies that there are indices that correlate with subjective wellbeing – life satisfaction such as noise problem and privacy value that could be recommended to be included in the regression as the independent variables in the public amenities domain in the future research.

The findings also show that proximity to shared clinic, sport, culture, and recreation amenities have significantly influenced the subjective wellbeing of the resident. Where there's no mediating effect applies, the shared clinic within walking distance has a negative sign while the shared sport, culture, and recreation that are within walking distance has a positive sign. This implies that the decreasing of the availability and accessibility of shared clinic within walking distance from home has the probability to increase the life satisfaction. It is recommended to include more indicators that may enrich the inferential analysis such as a feeling of uncomfortable when being close to the clinic where the illness is cumulated, to find out what behind the outcome of the inferential analysis of the public amenities domain. On the other hand, the increasing number of shared sport, culture, and recreation facilities that are within walking distance from home may increase subjective wellbeing. These findings are relevant to the theory that the subjective wellbeing affected by the proximity of school from home, quality housing, and public amenities offered for families in a city, whereas the children would like to see more of places to play (Ballas D., 2013) as well as the quality of the facilities.

The above findings answer the main research question - How does the availability and accessibility of the children domain in the public realm affect the subjective wellbeing (domain satisfaction and life satisfaction) in Rotterdam? Also sub research question number one and number two - Which indicators of children domain in the public realm significantly contribute to the satisfaction on the children domain of the people in the neighborhood? How does the satisfaction on children domain in the public realm contribute to the life satisfaction of the people in the neighbourhood? The answer can be summarized in table 18 below.

Table 18: Summary of children domain in the public realm that are significantly affect subjective wellbeing of the resident in the neigborhood

Subjective well-being		**Children domain in the public realm**
Life satisfaction	**Children domain satisfaction**	**School Domain**
	• Satisfied that in and around the neighborhood there is sufficient preschools (+) • Satisfied finds that in and around the neighborhood there is sufficient primary schools (+) • Satisfied that in and around the neighborhood there is sufficient secondary schools (+)	Availability and accessibility of primary school within walking distance (+)
Life satisfaction	**Children domain satisfaction**	**Route Domain - traffic safety**
	-	Report number of traffic accidents per 1,000 inhabitant (-)
		Route Domain – social safety
	-	Report number of violence crime per 1,000 inhabitants (-)
		Route Domain – physical provision
	-	Pedestrian pathway availability (+)
Life satisfaction	**Children domain satisfaction**	**Public amenities Domain**
	Satisfied that the area is suitable for different age group (-)	Availability and accessibility of park and playground within walk distance (-)
	-	Availability and accessibility of health facilities or clinic within walking distance (-)
	-	Availability and accessibility of sport, culture, and recreation facilities within walking distance (+)

Source: Author, 2017

Answering the sub question three - what other factors make child friendliness and subjective wellbeing differs among neighbourhoods? First, in the school domain, the quality of the school may attract the residents to choose where to live. It can be adopted as other factor that makes child-friendliness and subjective wellbeing differs among neighbourhood. Other factor is the idea to bring nature to city children in the primary school's playground as a measurement of child-friendliness in the neighbourhood.

In the route domain, the route safety in term of traffic safety determined by the road structure and the attempt to use traffic calming, especially in the area where children exist. The pedestrian pathways and the bicycle lane arrangement that can minimise conflicts with the street may raise the traffic safety. Moreover, escorting young children from home to school or especially when crossing the street may benefit the community with an opportunity to have social interaction. Also, the community involvement in building a more child-friendly city can also be measured as an indicator that makes child-friendliness and subjective wellbeing of neighbourhood varies. In the route safety concerning social safety, it should be seen in detail by case because it is not only on the presence of the stranger's danger but also on the case of pressure from peers. The idea of the city from the eye level may provide a substantial contribution to the children's route domain not only in terms of safety, but also a media to

connect with others in the neighbourhood. The provision of pedestrian pathway, bicycle route, and accessibility to public transport hub differ among neighbourhood depending on the neighbourhood characteristic. The route can also be the media of the children participation to create their own safe route to school, as one other factor that may elevate the child-friendliness and subjective wellbeing in the neighbourhood.

In public amenities domain, not only the availability of place that can accommodate the community sport, culture, and recreation's activities in the neighbourhood but programs that attract children as well as the residents to engage in the neighbourhood that is more important. The attempt to make the community centre to attract children and intergeneration to involve in activities can be adopted as an indicator of child-friendliness and subjective wellbeing in the neighbourhood.

The role of planning is not only about the distribution of city services and the distribution of population in the city. Planning also engages all resident regardless their age, gender, income, and ethnicity backgrounds to be actively involved in creating their place, as inclusiveness is part of the child-friendly city principle (Riggio, 2002). However, the child-friendly city assessment cannot be limited to the provision children space only. Children participation is also necessary in the process of urban planning, since it is the heart of child friendly city. The provision of space in the city for stimulating children to develop their full potential, should be compliment with the children participation in the process of the production of space for the children themselves.

To sum up, the children domain in the public realm highlights the destination of children in the neighbourhood and implies the child oriented space production in the city and yet contribute to subjective wellbeing – life satisfaction of the residents. As policy appraisal requires detailed measurement of subjective wellbeing to show the costs and benefits of different allocation decisions (Dolan, Peasgood, et al., 2008), indicators on child friendliness of the city in this thesis, the children domain in the public realm has been proofed to complement the indicators of subjective wellbeing.

5.2. Policy recommendation

The research provides the areas in which the municipality can concentrate their effort on child-friendly city implementation as well as increasing subjective wellbeing – life satisfaction of the residents as sum up in the above table 18. Moreover, the role of urban planning is essential in the production of space in the city, including spaces for children to develop their full potential. As urban planning can be described as work involving different scales, gradually from the city scale, the neighbourhood scale and the human scale, in which the last one is the key to better cities for people. It is the city where the people, including the children, experience it while walking and staying in the city (Gehl, 2010), and this implies the necessity of walking distance from home to the city services including schools and public amenities regarding their scale of services.

Planning principles that put the human dimension as the silver bullet in the public realm including first, to ensure proximity to the city's functions in the shortest distances from a critical mass of people. The second principle is to integrate various services to ensure social sustainability, security, and wealth of experience in the district scale. The third principle is to design city space that safe and attract pedestrians and cyclists traffic (Gehl, 2010). The fourth principle is to open up the edges between the city and buildings visually and physically accessible or well-known as the city at the eye level (Karssenberg, 2016) especially in the public realm. Also, inviting the people, family and children, to stay longer in the public realm (Gehl, 2010).

The city of Rotterdam child-friendly city policy can be seen as partially supporting the aim of the city to capture the nuclear family where double breadwinners partnering in team raising the children while working nearby (van den Berg, 2017). In a very subtle way, the aim could be interpreted as changing the existing demographic composition to certain target group to fill the residential area in the city. On the other way, child-friendly city principle promotes the inclusiveness and see that every child's right should be fulfilled (Riggio, 2002), regardless from which group the child comes from. As Tim Gill, a child's right activist and the founder of rethinking childhood questions, "Are child-friendly city approaches being used to push out poor families?"

5.3. Limitation of the research

- The research focus on the city level, so that it cannot investigate each neighbourhood in details, for example to foresee how the population of the neighbourhood is examined to define the need of the residents to the central elements in neighbourhood planning.
- Children domain in the public realm covers only physical provision and safety in the route domain despite of the quality of space as well as the human interaction.
- The limitation of the dataset regarding to the distribution of the respondents, the adult and the children may interfere the outcomes.
- It is not also observe the activities in the spaces and especially the children participation although it is one of the heart of Child's Right Convention.

5.4. Recommendation for future research

Future possible research to get a more comprehensive analysis on the child friendly city research:

- Children domain in the public realm is only partial concept of child-friendly city framework, therefore a more comprehensive indicators are possible to be developed to create a Child's Right based neighbourhood.
- Survey on children as the main respondent group on subjective wellbeing measurement to assess the children domain in the public realm.
- Include social and institutional services variables of children wellbeing to complete the built environment and the spatial implication of Child's Right's Convention.
- Develop a child-friendly physical development guidelines to ensure that the children domain in the public realm may give an opportunity for children to have stimulation to grow up and develop their full potential, while at the same time fulfil the Child's Right in the city.

Bibliography

Abramson, P. R. and Inglehart, R., 1995. Value change in global perspective. Ann Arbor, MI : University of Michigan Press,.

Alan C. Acook., 2012. A Gentle Introduction to Stata. Texas : Stata Press,.

Ballas D., 2013. What makes a 'happy city'? *Cities,* 32 (SUPPL.1), pp. S39-S50.

Baron, R. M. and Kenny, D. A. 1986. The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology,* 51 (6), pp. 1173.

Ben-Arieh, A., 2008. Indicators and Indices of Children's Well-Being: Towards a More Policy-Oriented Perspective. *European Journal of Education,* 43 (1), pp. 37-50.

Brereton, F., Clinch, J. P. and Ferreira, S. 2008. Happiness, geography and the environment. *Ecological Economics,* 65 (2), pp. 386-396. Available at: http://www.sciencedirect.com/science/article/pii/S0921800907003977/pdfft?md5=324d020f0c4669b32306368785188dcd&pid=1-s2.0-S0921800907003977-main.pdf [Accessed 08-12-2016].

Casas, F., Sarriera, J. C., Abs, D., Coenders, G., et al., 2012. Subjective Indicators of Personal Well-Being among Adolescents. Performance and Results for Different Scales in Latin-Language Speaking Countries: A Contribution to the International Debate. *Child Indicators Research : The Official Journal of the International Society for Child Indicators,* 5 (1), pp. 1-28.

Chawla, L., 2002. Growing up in an urbanising world. London :; Paris : Earthscan ;; UNESCO,.

Coates G.J., 2013. The sustainable Urban district of vauban in Freiburg, Germany. *International Journal of Design and Nature and Ecodynamics,* 8 (4), pp. 265-286.

Coulton, C. J. and Fischer, R. L. 2010. Using Early Childhood Wellbeing Indicators to Influence Local Policy and Services. Using Early Childhood Wellbeing Indicators to Influence Local Policy and Services. 2010. From Child Welfare to Child Well-Being : An International Perspective on Knowledge in the Service of Policy Making. Dordrecht : Springer Netherlands. pp. 101-116.

Coulton, C. J. and Korbin, J. E. 2007. Indicators of child well-being through a neighborhood lens. *Social Indicators Research,* 84 (3), pp. 349-361.

Diener, E., Napa-Scollon, C. K., Oishi, S., Dzokoto, V., et al., 2000. Positivity and the Construction of Life Satisfaction Judgments: Global Happiness is not the Sum of its Parts. *Journal of Happiness Studies,* 1 (2), pp. 159-176.

Dolan, P., Peasgood, T. and White, M. 2008. Do we really know what makes us happy, a review of the economic literature on the factors associated with subjective well-being.

pp. 94-122. Available at: http://www.sciencedirect.com/science/article/pii/S0167-4870(07)00069-4 .

Easterlin, R. A., 2001. Income and happiness: Towards a unified theory. *The Economic Journal,* 111 (473), pp. 465-484.

Elsley, S., 2004. Children's Experience of Public Space. *Children & Society,* 18 (2), pp. 155-164.

Frey, B. S. and Stutzer, A. 2002. What can economists learn from happiness research? *Journal of Economic Literature,* 40 (2), pp. 402-435. Available at: https://www.jstor.org/stable/pdf/2698383.pdf [Accessed 07-12-2016].

Gehl, J., 2010. Cities for people. Washington, DC : Island Press,.

Giles-Corti B, Broomhall MH, Knuiman M, Collins C, et al., 2005. Increasing walking: how important is distance to, attractiveness, and size of public open space? *American Journal of Preventive Medicine,* 28 (2 Suppl 2), pp. 169-76.

Gill, T., 2008. Space-oriented Children's Policy: Creating Child-friendly Communities to Improve Children's Well-being¹. *Children & Society,* 22 (2), pp. 136-142.

Glaeser, E. L., Kolko, J. and Saiz, A. 2001. Consumer city. *Journal of Economic Geography,* 1 (1), pp. 27.

Hart, R. and UNICEF., 1996. Children's community participation handbook : involving children in community development and environmental care. London : Earthscan,.

Hart, R., Wridt, P. and Giusti, D. 2011. The Child Friendly Community Assessment Tools : A Facilitator’s Guide to the Local Assessment of Children’s Rights.

Haugen, K., Holm, E., Strömgren, M., Vilhelmson, B., et al., 2012. Proximity, accessibility and choice: A matter of taste or condition?*. *Papers in Regional Science,* 91 (1), pp. 65-84.

Hayward, B., 2012. Children, citizenship, and environment : nurturing a democratic imagination in a changing world. London : Earthscan,.

Hayward, D. G. and Weitzer, W. H. 1984. The public's image of urban parks: Past amenity, present ambivalance, uncertain future. *Urban Ecology,* 8 (3), pp. 243-268.

Heller, D., Watson, D. and Ilies, R. 2004. The role of person versus situation in life satisfaction: A critical examination. *Psychological Bulletin,* 130 (4), pp. 574-600.

Helliwell, J. F., Layard, R. and Sachs, J., 2015. World happiness report 2015. Sustainable Development Solutions Network: New York. Available at: http://worldhappiness.report/wp-content/uploads/sites/2/2015/04/WHR15.pdf [Accessed 07-12-2016].

Hillman, M., Adams, J. and Whitelegg, J., 1990. One false move ... : a study of children's independent mobility. London : PSI,.

Insch, A. and Florek, M. 2010. **Place satisfaction of city residents: Findings and implications for city branding. In G. Ashworth & M. Kavaratzis (Eds.), Towards effective place brand management: Branding European cities and regions (pp. 191-204).**

Johnson, A. J. and Glover, T. D. 2013. Understanding Urban Public Space in a Leisure Context. *Leisure Sciences,* 35 (2), pp. 190-197.

Kamerman, S. B., Phipps, S. A. and Ben-Aryeh, A., 2009. From child welfare to child well-being : an international perspective on knowledge in the service of policy making. Dordrecht ;: Springer,.

Karen Malone, 2002. Street life: youth, culture and competing uses of public space. *Environment & Urbanization,* 14 (2), pp. 157-168.

Karssenberg, H., 2016. The city at eye level : lessons for street plinths. Second and extended version. Delft : Eburon Academic Publishers,.

Karsten, L., 1995. Building identities: gender perspectives on children and urban space : concluding report. Amsterdam : Instituut voor Sociale Geografie, Universiteit van Amsterdam,.

Karsten, L., 2002. Mapping Childhood in Amsterdam: the spatial and social construction of children's domains in the city. *Tijdschrift Voor Economische En Sociale Geografie,* 93 (3), pp. 231-241.

Kim, J. and Mueller, C. W., 1978. Factor analysis : statistical methods and practical issues. Beverly Hills, Calif. : Sage Publications,.

Leyden, K. M., Goldberg, A. and Michelbach, P. 2011. Understanding the pursuit of happiness in ten major cities. *Urban Affairs Review,* 47 (6), pp. 861-888. Available at: http://uar.sagepub.com/content/47/6/861.full.pdf [Accessed 22-12-2015].

Loon, J. and Frank, L. 2011. Urban Form Relationships with Youth Physical Activity: Implications for Research and Practice. *Journal of Planning Literature,* 26 (3), pp. 280-308.

Lynch, K. ed., 1977. Growing Up in Cities. London: UNESCO and MIT Press.

Marans, R. W. and Stimson, R. J., 2011. Investigating quality of urban life : theory, methods, and empirical research. Dordrecht ;: Springer,.

Martin, D. G., 2003. "Place-Framing" as Place-Making: Constituting a Neighborhood for Organizing and Activism. *Annals of the Association of American Geographers,* 93 (3), pp. 730-750.

Montgomery, J., 2007. Making a city: Urbanity, vitality and urban design. *Journal of Urban Design,* 3 (1), pp. 93-116.

Nordström, M., 2010. Children's Views on Child-friendly Environments in Different Geographical, Cultural and Social Neighbourhoods. *Urban Studies,* 47 (3), pp. 514-528.

Park, Y. and Rogers, G. O. 2015. Neighborhood Planning Theory, Guidelines, and Research. *CPL Bibliography,* 30 (1), pp. 18-36.

Riggio, E., 2002. Child friendly cities: good governance in the best interests of the child. *Environment and Urbanization,* 14 (Part 2), pp. 45-58.

Robert J. Rogerson, 1999. Quality of Life and City Competitiveness. *Urban Studies,* 36 (5-6), pp. 969-985.

Rogerson, R. J., 1999. Quality of life and city competitiveness. *Urban Studies,* 36 (5-6), pp. 969-985. Available at: http://usj.sagepub.com/content/36/5-6/969.full.pdf [Accessed 08-12-2016].

Thiel, S. v., 2014. Research methods in public administration and public management : an introduction. London ;: Routledge, Taylor & Francis Group,.

Tienda, M. and Wilson, W. J., 2002. Youth in cities : a cross-national perspective. Cambridge, UK ;: Cambridge University Press,.

Tranter, P. and Whitelegg, J. 1994. Children's travel behaviours in Canberra: car-dependent lifestyles in a low-density city. *Journal of Transport Geography,* 2 (4), pp. 265-273.

van den Berg, M., 2017. Gender in the Post-Fordist Urban The Gender Revolution in Planning and Public Policy. Cham : Springer International Publishing,.

Veenhoven, R., 1991. Is happiness relative? *Social Indicators Research,* 24 (1), pp. 1-34. Available at: http://link.springer.com/content/pdf/10.1007%2FBF00292648.pdf [Accessed 07-12-2016].

Veenhoven, R., 1996. Developments in satisfaction research. *Social Indicators Research,* 37 (1), pp. 1-46. Available at: http://link.springer.com/content/pdf/10.1007%2FBF00300268.pdf [Accessed 08-12-2016].

Veenhoven, R., 2009. Well-Being in Nations and Well-Being of Nations. *Social Indicators Research,* 91 (1), pp. 5-21.

Ward, C., 1978. The child in the city. 1st American ed. New York : Pantheon Books,.

Whitzman C., Mizrachi D. and Worthington M. 2010. The journey and the destination matter: Child-Friendly Cities and children's right to the City. *Built Environment,* 36 (4), pp. 474-486.

Widowati, M., Patilima, H. and Drianda, R. P., 2014. Visi Kabupaten Kota Layak Anak. 1. Jakarta, Indonesia: Pena Nusantara.

Xinshu Zhao, John G. Lynch and Qimei Chen 2011. Reconsidérer Baron et Kenny: mythes et vérités à propos de l'analyse de médiation. *Recherche Et Applications En Marketing*, 26 (1), pp. 81-95.

Young, C., 2009. Model Uncertainty in Sociological Research: An Application to Religion and Economic Growth. *American Sociological Review*, 74 (3), pp. 380-397.

Annex 1: Children domain in the public realm, an assessment on child friendly city through subjective wellbeing in Rotterdam

Kinderen domein in het publieke domein Een assessment op kindvriendelijke stad door subjectief welzijn in Rotterdam

This is an in-depth interview which is conducted as part of a thesis for completing Master of Science course of Urban Management and Development in Institute for Housing and Urban Development, Erasmus University Rotterdam. Please kindly completely fill in the general questionnaire below. Information provided will be treated in highly confidential. Thank you for your cooperation. Marini Widowati.

Dit is een diepte-interview het die wordt uitgevoerd als onderdeel van een proefschrift voor het voltooien van de Master of Science loop van Urban Management and Development in het Instituut voor Huisvesting en Stedelijke Ontwikkeling, de Erasmus Universiteit Rotterdam. Neem dan zo vriendelijk volledig in de algemene onderstaande vragenlijst in te vullen. Verstrekte informatie zal in een zeer vertrouwelijk worden behandeld. Hartelijk dank voor uw medewerking.

---

1. General *Algemeen*

Name *Naam*

Age *leeftijd*

Gender *geslacht*

Male *mannelijk*	
Female *vrouw*	

Highest educational attainment *Hoogste opleidingsniveau*

Occupation *Bezetting*

Ethnicity background *Etniciteit achtergrond*

Zip code *Postcode*

Average income *Gemiddeld inkomen*

< 1,000	
1,001 – 2,500	
2,500 – 5,000	
>5,000	

Marital status *Burgerlijke staat*

Single *single*	
Married *getrouwd*	
Divorce *echtscheiding*	
Partner *partner*	

Children in the family *Kinderen in het gezin*

Living with children *Leven met kinderen*	
Living without children *Leven zonder kinderen*	
Living with other person <18 years old *Leven met andere personen <18 jaar oud*	

2. Research Context *Onderzoek Context*

Child Friendly city policy awareness *Kindvriendelijk stad beleid bewustzijn*

Knowledgeable and understand *Deskundig en begrijpen*	
Somehow know *een of andere manier weten*	
Never heard *never heard*	

Children domain satisfaction *tevredenheid kinderen domain*

School	Satisfy *voldoen*		Dissatisfy *ontevreden stemmen*	
Route from home to school *Route van huis naar school*	Satisfy *voldoen*		Dissatisfy *ontevreden stemmen*	
Public amenities *openbare voorzieningen*	Satisfy *voldoen*		Dissatisfy *ontevreden stemmen*	

Life satisfaction *tevredenheid met het leven*

All in all, how satisfy are you with your life *Al met al, hoe tevreden bent u met uw leven*	Unhappy *ongelukkig*	Least happy *minst gelukkig*	Less happy *minder gelukkig*	Happy *gelukkig*

3. Guidelines for the municipality, Non Government Organization, and Child friendly city expert

- What do you think about the presence of the children in the neighbourhood? *Wat vind je van de aanwezigheid van de kinderen in de buurt?*
- What is your opinion about the school facilities, the primary schools, the secondary schools in the neighbourhood? Is the proximity of the schools from home matter? *Wat is uw mening over de schoolfaciliteiten, de basisscholen, de middelbare scholen in de buurt? Is de nabijheid van de scholen vanuit huis?*
- What do you think about the children route from home to school, from home to the public amenities, from school to the public amenities? Is it safe for children (0 to 18 years old)? *Wat vind je van de*

kinderroute van huis naar school, van thuis naar de openbare voorzieningen, van school naar de openbare voorzieningen? Is het veilig voor kinderen (0 tot 18 jaar)?

- What do you think about the presence of public amenities where children can have activities? Is the proximity of the public amenities matter for the people? *Wat vind je van de aanwezigheid van openbare voorzieningen waar kinderen activiteiten kunnen hebben? Is de nabijheid van de openbare voorzieningen van belang voor de mensen?*
- What is your opinion about Child Friendly City policy? (for municipality, NGO's for children, parents) How do you see the field worker and the resident participation in the neighbourhood? *Wat is uw mening over kindervriendelijk stadsbeleid? (Voor gemeente, NGO's voor kinderen, ouders) Hoe ziet u de veldwerker en de inwoner deelname in de buurt?*
- What is your opinion about life satisfaction? What factor determine life satisfaction? *Wat is uw mening over de levensbevrediging? Welke factor bepaalt levensstevredenheid?*

4. Guidelines for parents

- What do you think about the presence of the children in the neighbourhood? *Wat vind je van de aanwezigheid van de kinderen in de buurt?*
- What is your opinion about the school facilities, the primary schools, the secondary schools in the neighbourhood? Is the proximity of the schools from home matter? *Wat is uw mening over de schoolfaciliteiten, de basisscholen, de middelbare scholen in de buurt? Is de nabijheid van de scholen vanuit huis?*
- What do you think about the children route from home to school, from home to the public amenities, from school to the public amenities? Is it safe for children (0 to 18 years old)? *Wat vind je van de kinderroute van huis naar school, van thuis naar de openbare voorzieningen, van school naar de openbare voorzieningen? Is het veilig voor kinderen (0 tot 18 jaar)?*
- What do you think about the presence of public amenities where children can have activities? Is the proximity of the public amenities matter for the people? *Wat vind je van de aanwezigheid van openbare voorzieningen waar kinderen activiteiten kunnen hebben? Is de nabijheid van de openbare voorzieningen van belang voor de mensen?*
- What is your opinion about life satisfaction? What factor determine life satisfaction? *Wat is uw mening over de levensbevrediging? Welke factor bepaalt levensstevredenheid?*

5. Guidelines for children

- How do you go to school from home? How do you go to other places in the city? *Hoe ga je thuis naar school? Hoe ga je naar school naar andere plaatsen in de stad?*
- What do you like to do in the neighbourhood? *Wat vind je leuk in de buurtl?*
- What is your favourite place to be in the neighbourhood? *Wat is je favoriete plek in de buurt? Gelieve het te tekenen.*

Annex 2: Explanation of themes and indicators of Child Friendly neighbourhood index in Rotterdam

General theme	Subjective Indicators	Objective Indicators
	Index on suitable neighbourhood for children Index suitable neighbourhood for children up to 4 years in the form of percentage that the neighbourhood (very) caters for children up to about 4 years Index suitable neighbourhood for suitable neighbourhood for 4- to 13 year olds in the form of Percentage that the neighbourhood (very) caters for children from 4 years to about 13 years Index suitable neighbourhood for 13- to 18-year-olds in the form of percentage that the neighbourhood (very) caters for children and adolescents aged 13 to about 18 years	Index on the neighbourhood attractiveness for family Percentage of families with a child born five years ago as the first child of a family living in the same neighbourhood where the current family lives, relative to all families in the neighbourhood who received their first child five years ago, 2 years average.
Social aspect	Subjective Indicators	Objective Indicators
	Index Judging parenting climate Index Judge parent and child care in the form of percentage (completely) agree with the statement: I respect how parents deal with their children in my neighbourhood. Index Judge young and old in the form of percentage (completely) agree with the statement: Young people and adults are doing well in this area. Index Judge accountability in the form of percentage (completely) agree with the statement: If a child is destroying something or behaving unresponsibly, I say something about it. Index Judgment of children in the form of Percentage (completely) agree with the statement: There is always an adult out of the box who is watching the outdoor children. Index Judging standard behavior youth in the form of Percentage (completely) agree with the statement: The adults in my street are usually about what children may and may not. Index Judge mutual intercourse youth Index Judge supervision by older youth in the form of Percentage (completely) agree with the statement: You can trust the older children to watch the younger children. Index Judge young children in the form of Percentage (totally) disagree with the statement: I think the younger children are struggling with each other Index Judgment of older youth in the form of Percentage (completely) agree with the statement: I think that the older youth deal with each other. Index Judge the elderly and younger children in the form of Percentage (totally) disagree with the statement: I think older children often do annoying against the younger children.	Index Living and moving mobility (social stability) Index Presence and keychain peers Index Near home to primary school (neighbourhood)
Physical aspect	Subjective Indicators	Objective Indicators
	Index Judging family suit housing Index Judging childhood housing in the form of percentage that the home is suitable for a family with two children	Index Presence of family-friendly homes Index Proximity to playgrounds

	Index Judging presence and quality playgrounds	
Safety Aspect	Subjective Indicators	Objective Indicators
	Index Judging road safety Index Judging social security	Index Child friendly school routes Index Social Security
Facilities Provision Aspect	Subjective Indicators	Objective Indicators
	Index Judge attendance schools and childcare Index Judgment attendance leisure facilities youth Index Judging interaction leisure youth	Index Provision and options for childcare Index Proximity and options schools Index Provision and options for play facilities

Annex 3: Child's Right Convention articles that have spatial implication on Child Friendly City Policy

Text of Article 9

1. States Parties shall ensure that a child shall not be separated from his or her parents against their will, except when competent authorities subject to judicial review determine, in accordance with applicable law and procedures, that such separation is necessary for the best interests of the child. Such determination may be necessary in a particular case such as one involving abuse or neglect of the child by the parents, or one where the parents are living separately and a decision must be made as to the child's place of residence.

2. In any proceedings pursuant to paragraph 1 of the present article, all interested parties shall be given an opportunity to participate in the proceedings and make their views known.

3. States Parties shall respect the right of the child who is separated from one or both parents to maintain personal relations and direct contact with both parents on a regular basis, except if it is contrary to the child's best interests.

4. Where such separation results from any action initiated by a State Party, such as the detention, imprisonment, exile, deportation or death (including death arising from any cause while the person is in the custody of the State) of one or both parents or of the child, that State Party shall, upon request, provide the parents, the child or, if appropriate, another member of the family with the essential information concerning the whereabouts of the absent member(s) of the family unless the provision of the information would be detrimental to the well-being of the child. States Parties shall further ensure that the submission of such a request shall of itself entail no adverse consequences for the person(s) concerned.

Text of article 17

States Parties recognize the important function performed by the mass media and shall ensure that the child has access to information and material from a diversity of national and international sources, especially those aimed at the promotion of his or her social, spiritual and moral well-being and physical and mental health. To this end, States Parties shall: (a) Encourage the mass media to disseminate information and material of social and cultural benefit to the child and in accordance with the spirit of article 29; (b) Encourage international cooperation in the production, exchange and dissemination of such information and material from a diversity of cultural, national and international sources; (c) Encourage the production and dissemination of children's books; (d) Encourage the mass media to have particular regard to the linguistic needs of the child who belongs to a minority group or who is indigenous; (e) Encourage the development of appropriate guidelines for the protection of the child from information and material injurious to his or her well-being, bearing in mind the provisions of articles 13 and 18.

Text of article 23

1. States Parties recognize that a mentally or physically disabled child should enjoy a full and decent life, in conditions which ensure dignity, promote self-reliance and facilitate the child's active participation in the community.

2. States Parties recognize the right of the disabled child to special care and shall encourage and ensure the extension, subject to available resources, to the eligible child and those responsible for his or her care, of assistance for which application is made and which is appropriate to the child's condition and to the circumstances of the parents or others caring for the child.

3. Recognizing the special needs of a disabled child, assistance extended in accordance with paragraph 2 of the present article shall be provided free of charge, whenever possible, taking into account the financial resources of the parents or others caring for the child, and shall be designed to ensure that the disabled child has effective access to and receives education, training, health care services, rehabilitation services, preparation for employment and recreation opportunities in a manner conducive to the child's achieving the fullest possible social integration and individual development, including his or her cultural and spiritual development.

4. States Parties shall promote, in the spirit of international cooperation, the exchange of appropriate information in the field of preventive health care and of medical, psychological and functional treatment of disabled children, including dissemination of and access to information concerning methods of rehabilitation, education and vocational services, with the aim of enabling States Parties to improve their capabilities and skills and to widen their experience in these areas. In this regard, particular account shall be taken of the needs of developing countries.

Text of Article 24

1. States Parties recognize the right of the child to the enjoyment of the highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health. States Parties shall strive to ensure that no child is deprived of his or her right of access to such health care services.

2. States Parties shall pursue full implementation of this right and, in particular, shall take appropriate measures: (a) To diminish infant and child mortality; (b) To ensure the provision of necessary medical assistance and health care to all children with emphasis on the development of primary health care; (c) To combat disease and malnutrition, including within the framework of primary health care, through inter alia, the application of readily available technology and through the provision of adequate nutritious foods and clean drinking water, taking into consideration the dangers and risks of environmental pollution; (d) To ensure appropriate prenatal and postnatal health care for mothers; (e) To ensure that all segments of society, in particular parents and children, are informed, have access to education and are supported in the use of basic knowledge of child health and nutrition, the advantages of breastfeeding, hygiene and environmental sanitation and the prevention of accidents; (f) To develop preventive health care, guidance for parents and family planning education and services.

3. States Parties shall take all effective and appropriate measures with a view to abolishing traditional practices prejudicial to the health of children. 4. States Parties undertake to promote and encourage international cooperation with a view to achieving progressively the full realization of the right recognized in the present article. In this regard, particular account shall be taken of the needs of developing countries.

Text of article 25

States Parties recognize the right of a child who has been placed by the competent authorities for the purposes of care, protection or treatment of his or her physical or mental health to a periodic review of the treatment provided to the child and all other circumstances relevant to his or her placement.

Text of article 27

1. States Parties recognize the right of every child to a standard of living adequate for the child's physical, mental, spiritual, moral and social development.

2. The parent(s) or others responsible for the child have the primary responsibility to secure, within their abilities and financial capacities, the conditions of living necessary for the child's development.

3. States Parties, in accordance with national conditions and within their means, shall take appropriate measures to assist parents and others responsible for the child to implement this right and shall in case of need provide material assistance and support programmes, particularly with regard to nutrition, clothing and housing.

4. States Parties shall take all appropriate measures to secure the recovery of maintenance for the child from the parents or other persons having financial responsibility for the child, both within the State Party and from abroad. In particular, where the person having financial responsibility for the child lives in a State different from that of the child, States Parties shall promote the accession to international agreements or the conclusion of such agreements, as well as the making of other appropriate arrangements.

Text of article 28

1. States Parties recognize the right of the child to education, and with a view to achieving this right progressively and on the basis of equal opportunity, they shall, in particular: (a) Make primary education compulsory and available free to all; (b) Encourage the development of different forms of secondary education, including general and vocational education, make them available and accessible to every child, and take appropriate measures such as the introduction of free education and offering financial assistance in case of need; (c) Make higher education accessible to all on the basis of capacity by every appropriate means; (d) Make educational and vocational information and guidance available and accessible to all children; (e) Take measures to encourage regular attendance at schools and the reduction of drop-out rates.

2. States Parties shall take all appropriate measures to ensure that school discipline is administered in a manner consistent with the child's human dignity and in conformity with the present Convention.

3. States Parties shall promote and encourage international cooperation in matters relating to education, in particular with a view to contributing to the elimination of ignorance and illiteracy throughout the world and facilitating access to scientific and technical knowledge and modern teaching methods. In this regard, particular account shall be taken of the needs of developing countries.

Text of article 31

1. States Parties recognize the right of the child to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts.

2. States Parties shall respect and promote the right of the child to participate fully in cultural and artistic life and shall encourage the provision of appropriate and equal opportunities for cultural, artistic, recreational and leisure activity.

Annex 4: Rotterdam profile and neighbourhood list

Table 19: List of neighbourhood based on the dataset used in the research

Neighbourhood	Neighbourhood
Afrikaanderwijk	Ommoord
Agniesebuurt	Oosterflank
Bergpolder	Oud Crooswijk
Beverwaard	Oud Ijsselmonde
Blijdorp	Oud Mathenesse
Bloemhof	Oud-Charlois
Bospolder	Oude Noorden
Carnisse	Oude Westen
Cool	Overschie
Cs Kwartier	Pendrecht
De Esch	Pernis
Delfshaven	Prinsenland
Dorp	Provenierswijk
Feijenoord	Rozenburg
Groot Ijsselmonde	Rubroek
Groot IJsselmonde-Zuid	Schiebroek
Heijplaat	Schiemond
Het Lage Land	S-Gravenland
Hillegersberg Noord	Spangen
Hillegersberg Zuid	Stadsdriehoek
Hillesluis	Strand en Duin
Hoogvliet Noord	Oude Noorden
Hoogvliet Zuid	Oude Westen
Katendrecht	Struisenburg
Kleinpolder	Tarwewijk
Kop van Zuid	Terbregge
Kop van Zuid-Entrepot	Tussendijken
Kralingen Oost	Vreewijk
Kralingen West	Wielewaal
Kralingse Veer	Zevenkamp
Liskwartier	Zuiderpark en Zuidrand
Lombardijen	Zuidplein
Middelland	Zuidwijk
Molenlaankwartier	
Nesselande	
Nieuw Crooswijk	
Nieuwe Werk	
Nieuwe Westen	
Noord Kethel	
Noordereiland	

Source: Author, 2017

Annex 5: Table of Marginal Effect

Table 20: Marginal effect of the School Domain

VARIABLES	(1) y1
Preschool within walking distance	7.42e-05
	(0.00313)
Home within average of distance to the nearest primary school = 267m	0.00278
	(0.00565)
Average number of primary school within walking distance	0.00490*
	(0.00260)
Secondary school VMBO =889m	0.00402
	(0.00414)
Secondary school HAVO/VWO = 1,117m	-1.01e-05
	(0.00341)
Secondary school VMBO relatively close from home	-0.000438
	(0.00110)
Secondary school HAVO/VWO relatively close from home	-0.000226
	(0.000684)
_Igender_1	-0.00424***
	(0.00160)
_Ihousehold_1	-0.00146
	(0.00392)
_Ihousehold_2	0.00386
	(0.00444)
_Ihousehold_3	7.16e-05
	(0.00391)
_Ihousehold_4	-0.000324
	(0.00397)
_Ihousehold_5	-0.00307
	(0.00630)
_Ihousehold_6	0.0174
	(0.0211)
_Iage_1	-0.0112***
	(0.00370)
_Iincome_1	0.0133***
	(0.00392)
_Iincome_2	0.00739*
	(0.00392)
_Iincome_3	-0.00444
	(0.00386)
_Iincome_4	-0.00648*
	(0.00375)
_Iincome_5	-0.00311
	(0.00383)
_Iethnicity_2	0.0148***
	(0.00313)
_Iethnicity_3	0.00541**

	(0.00237)
_Iethnicity_4	0.00528
	(0.00377)
_Iethnicity_5	0.00477
	(0.00327)
_Iethnicity_6	0.0112***
	(0.00426)
_Iethnicity_7	0.00290
	(0.00532)
_Iethnicity_8	0.0200***
	(0.00483)
_Iethnicity_9	0.0108**
	(0.00459)
Observations	5,053

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Author, 2017

Table 21: Marginal effect of the traffic safety - route domain inferential analysis

VARIABLES	(1) y1
Home within the area of traffic (25m from 50miles/hour road)	-0.0147
	(0.0104)
Home with barrier free route to primary school up to 1,000m	0.00219
	(0.00349)
Number of traffic accidents per 1,000 inhabitant	-0.000212**
	(9.98e-05)
Satisfied that nearby children have little traffic problem	0.0452***
	(0.0173)
Satisfied that children can cross safely nearby	-0.0431**
	(0.0214)
Satisfied that children can safely ride on the street	0.00650
	(0.0186)
_Igender_1	-0.00416***
	(0.00160)
_Ihousehold_1	-0.00140
	(0.00391)
_Ihousehold_2	0.00347
	(0.00444)
_Ihousehold_3	0.000117
	(0.00391)
_Ihousehold_4	-0.000177
	(0.00396)
_Ihousehold_5	-0.00295

	(0.00630)
_Ihousehold_6	0.0188
	(0.0212)
_Iage_1	-0.0114***
	(0.00371)
_Iincome_1	0.0131***
	(0.00392)
_Iincome_2	0.00728*
	(0.00392)
_Iincome_3	-0.00459
	(0.00386)
_Iincome_4	-0.00639*
	(0.00375)
_Iincome_5	-0.00288
	(0.00384)
_Iethnicity_2	0.0150***
	(0.00314)
_Iethnicity_3	0.00533**
	(0.00240)
_Iethnicity_4	0.00541
	(0.00378)
_Iethnicity_5	0.00513
	(0.00328)
_Iethnicity_6	0.0114***
	(0.00429)
_Iethnicity_7	0.00371
	(0.00536)
_Iethnicity_8	0.0206***
	(0.00485)
_Iethnicity_9	0.0102**
	(0.00459)
Observations	5,047

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Author, 2017

Table 22: Marginal effect of social safety - route domain inferential analysis

	(1)
VARIABLES	y1
Number of violence crime per 1,000 inhabitant	-1.39e-05**
	(6.08e-06)
_Igender_1	-0.00419***
	(0.00159)
_Ihousehold_1	-0.00156
	(0.00391)
_Ihousehold_2	0.00375
	(0.00443)

_lhousehold_3	0.000111
	(0.00391)
_lhousehold_4	-0.000312
	(0.00396)
_lhousehold_5	-0.00301
	(0.00628)
_lhousehold_6	0.0179
	(0.0212)
_lage_1	-0.0114***
	(0.00370)
_lincome_1	0.0131***
	(0.00391)
_lincome_2	0.00721*
	(0.00392)
_lincome_3	-0.00466
	(0.00385)
_lincome_4	-0.00622*
	(0.00374)
_lincome_5	-0.00298
	(0.00382)
_lethnicity_2	0.0153***
	(0.00313)
_lethnicity_3	0.00549**
	(0.00233)
_lethnicity_4	0.00578
	(0.00377)
_lethnicity_5	0.00499
	(0.00325)
_lethnicity_6	0.0116***
	(0.00425)
_lethnicity_7	0.00390
	(0.00533)
_lethnicity_8	0.0208***
	(0.00484)
_lethnicity_9	0.0104**
	(0.00454)
Observations	5,055

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Author, 2017

Table 23: Marginal effect the route domain – physical provision inferential analysis

	(1)
VARIABLES	y1
Pedestrian area availability	0.0103*
	(0.00527)
Bicycle route availability	9.12e-10

	(4.71e-09)
Transit hub with reasonable distance	-0.000119
	(0.00198)
_Igender_1	-0.00417***
	(0.00159)
_Ihousehold_1	-0.00158
	(0.00391)
_Ihousehold_2	0.00383
	(0.00443)
_Ihousehold_3	0.000166
	(0.00391)
_Ihousehold_4	-0.000329
	(0.00396)
_Ihousehold_5	-0.00301
	(0.00629)
_Ihousehold_6	0.0172
	(0.0212)
_Iage_1	-0.0112***
	(0.00369)
_Iincome_1	0.0131***
	(0.00391)
_Iincome_2	0.00723*
	(0.00391)
_Iincome_3	-0.00455
	(0.00385)
_Iincome_4	-0.00606
	(0.00374)
_Iincome_5	-0.00268
	(0.00383)
_Iethnicity_2	0.0150***
	(0.00312)
_Iethnicity_3	0.00513**
	(0.00234)
_Iethnicity_4	0.00563
	(0.00377)
_Iethnicity_5	0.00472
	(0.00325)
_Iethnicity_6	0.0113***
	(0.00424)
_Iethnicity_7	0.00356
	(0.00533)
_Iethnicity_8	0.0206***
	(0.00484)
_Iethnicity_9	0.0101**
	(0.00457)
Observations	5,055

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author, 2017

Table 24: Marginal effect of public amenities domain – park and playgrounds

VARIABLES	(1) y1
Public space within walking distance	-0.00455
	(0.00351)
Shared Playground within walking distance	0.00727**
	(0.00353)
Homes within walking distance to citypark	0.00214
	(0.00273)
Homes with duimdrop location within walking distance	0.00131
	(0.00228)
Satisfied that the neighborhood suit for children MV	0.00196
	(0.00120)
_Igender_1	-0.00422***
	(0.00159)
_Ihousehold_1	-0.00152
	(0.00391)
_Ihousehold_2	0.00386
	(0.00444)
_Ihousehold_3	0.000116
	(0.00391)
_Ihousehold_4	-0.000430
	(0.00396)
_Ihousehold_5	-0.00300
	(0.00629)
_Ihousehold_6	0.0176
	(0.0212)
_Iage_1	-0.0114***
	(0.00370)
_Iincome_1	0.0130***
	(0.00391)
_Iincome_2	0.00723*
	(0.00392)
_Iincome_3	-0.00467
	(0.00385)
_Iincome_4	-0.00619*
	(0.00374)
_Iincome_5	-0.00286
	(0.00383)
_Iethnicity_2	0.0150***
	(0.00316)
_Iethnicity_3	0.00513**
	(0.00242)
_Iethnicity_4	0.00553
	(0.00378)
_Iethnicity_5	0.00493
	(0.00327)
_Iethnicity_6	0.0112***
	(0.00430)

_Iethnicity_7	0.00319
	(0.00535)
_Iethnicity_8	0.0203***
	(0.00484)
_Iethnicity_9	0.00989**
	(0.00460)
Observations	5,055

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Author, 2017

Table 25: Marginal effect of Public amenities domain – clinic, sport/culture/recreational, childcare

VARIABLES	(1) y1
Clinic/GP within walking distance	0.00780*
	(0.00428)
Sport, culture, rec within walking distance	0.00877*
	(0.00529)
Several different types of sport, cult, rec	-1.14e-05
	(5.46e-05)
Childcare within walking distance	4.06e-05
	(0.000926)
_Igender_1	-0.00410**
	(0.00159)
_Ihousehold_1	-0.00190
	(0.00391)
_Ihousehold_2	0.00343
	(0.00444)
_Ihousehold_3	-6.90e-05
	(0.00391)
_Ihousehold_4	-0.000523
	(0.00396)
_Ihousehold_5	-0.00342
	(0.00629)
_Ihousehold_6	0.0171
	(0.0212)
_Iage_1	-0.0112***
	(0.00369)
_Iincome_1	0.0133***
	(0.00392)
_Iincome_2	0.00737*
	(0.00392)
_Iincome_3	-0.00442
	(0.00385)
_Iincome_4	-0.00621*
	(0.00374)
_Iincome_5	-0.00298

	(0.00382)
_Iethnicity_2	0.0148***
	(0.00313)
_Iethnicity_3	0.00522**
	(0.00237)
_Iethnicity_4	0.00559
	(0.00377)
_Iethnicity_5	0.00506
	(0.00327)
_Iethnicity_6	0.0115***
	(0.00426)
_Iethnicity_7	0.00368
	(0.00533)
_Iethnicity_8	0.0204***
	(0.00483)
_Iethnicity_9	0.0102**
	(0.00458)
Observations	5,053

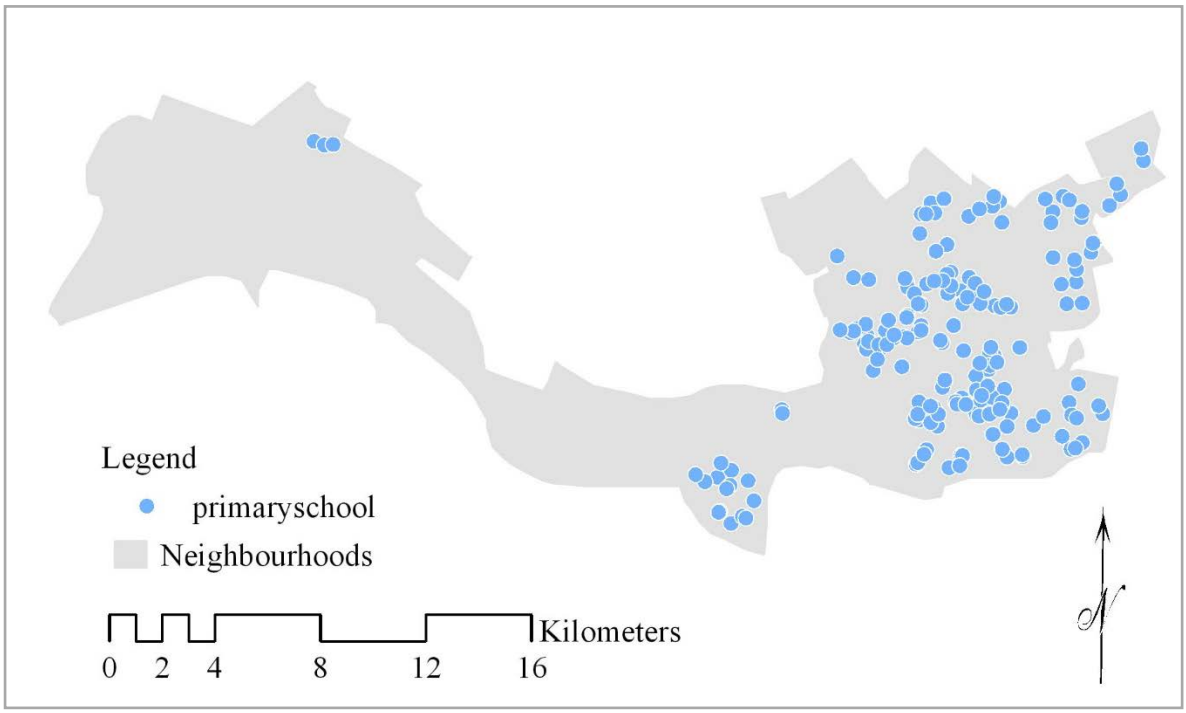
Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author, 2017

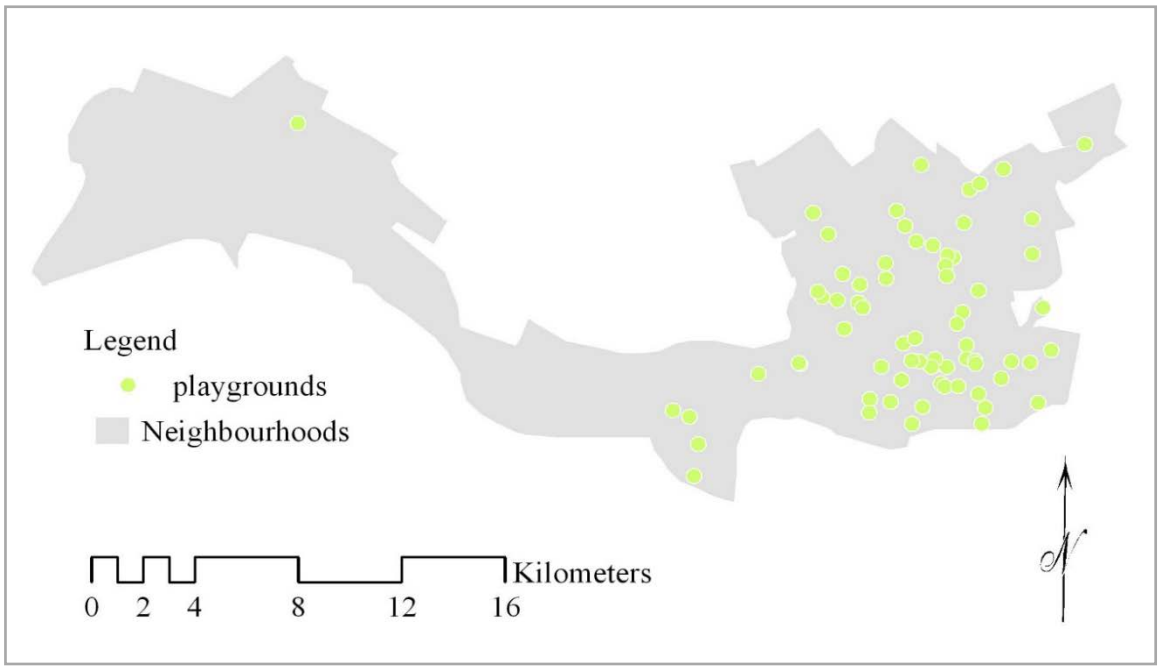
Annex 6: Map of distribution of children domain in the public realm created by arcGIS

Figure 25: Spatial distribution of primary schools in Rotterdam



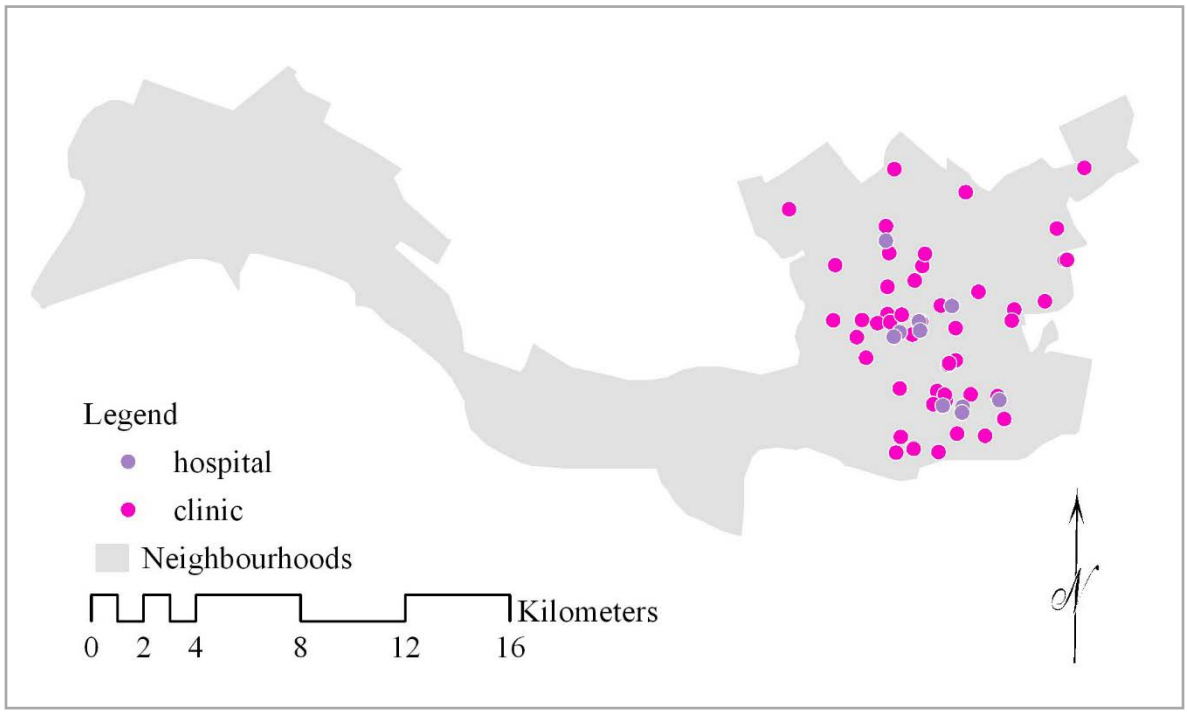
Source: Author, 2017

Figure 26: Spatial distribution of park and playground in Rotterdam



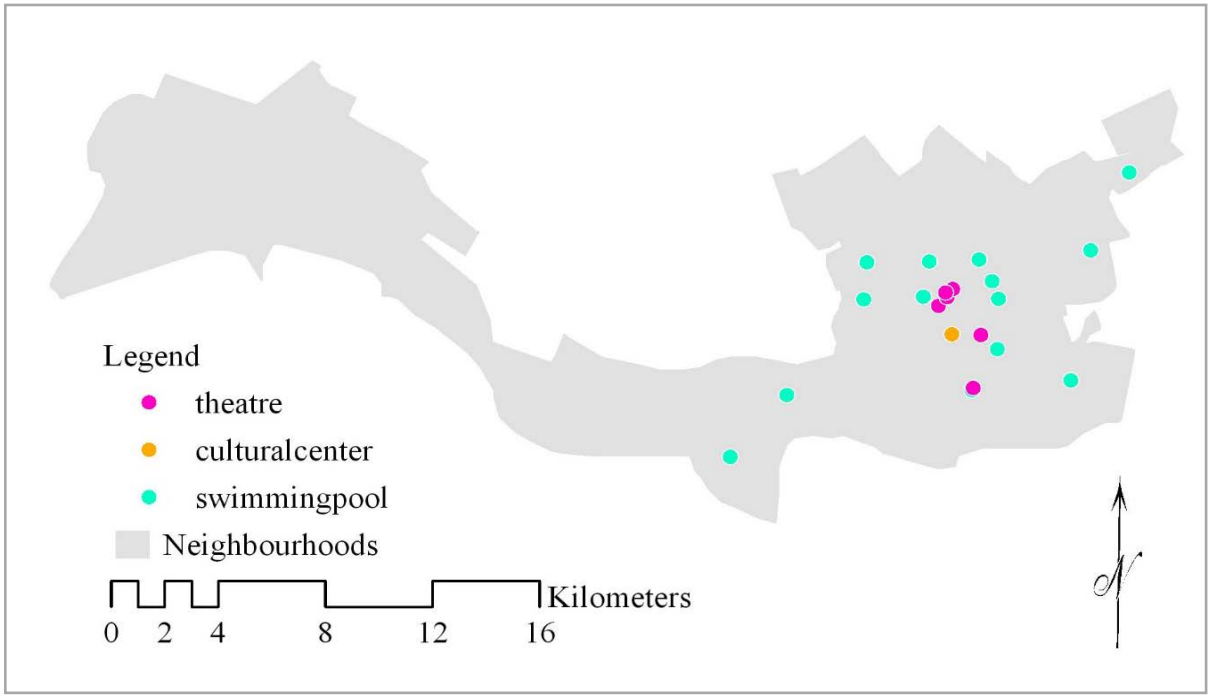
Source: Author, 2017

Figure 27: Spatial distribution of sport and culture facilities in Rotterdam



Source: Author, 2017

Figure 28: Spatial distribution of healthcare in Rotterdam



Source: Author, 2017

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