

"THE COMPLEX THEORY OF NEIGHBORHOOD SAFETY"

The influence of physical- and social characteristics on neighborhood safety in the five main cities of Overijssel

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UNIVERSITY OF TWENTE.

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Preface

In front of you, you can find my master thesis that I have written to complete my master study Public Administration at the University of Twente. In this thesis I combined my interest in safety and the safety environment where citizens live in; the neighborhood. My study-period at the University of Twente is characterized by study and tentams, but also by a lot of fun, parties and badminton. My final research is my 'masterpiece' that concludes a period as a 'student' and starts a new period as a master of science in the Public Administration.

During my study and conducting my research, I got a lot of help and support from several people that I want to thank in this section. To start with, I would like to say thanks to the people who helped my finishing my study in Public Administration by helping me in my research and writing my thesis: Bas Denter and Guus Meershoek. I would like to thank them for always answering my questions, give me interesting input and helpful advice. Furthermore I would like to thank Miriam Losse from the Saxion University of Applied Sciences for her help and support on different complex safety theories and her help by the different statistical analyses. Without the help of these people, it would cost me more time and effort to finish my research in the way I finished it right now.

Next to the people of the University of Twente and the Saxion University of Applied Sciences, I've got a lot of help and support from my family and friends. Off course I want to thank my parents and my sister, who supported me during my entire study period. Furthermore I want to thank my boyfriend, Vincent, who always helped me out with problems and difficult choices, but also celebrates important progresses with me. Next to my family I want to thank a lot of friends from DIOK for the relaxation, the badminton games and the drinks after the training and competition games. At the end, I want to thank you as a reader of my thesis. I hope you will enjoy reading about my research that I've done the last couple of months as a student at the University of Twente.

Kerstin Takken

Enschede, 18-08-2014

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Summary (Dutch)

In Nederland zijn veel wijken te vinden waarin mensen wonen, leven, werken en recreëren. Natuurlijk streeft iedereen naar een zo optimaal veiligheidsklimaat, maar de werkelijkheid is vaak anders. Niet elke wijk in Nederland is even veilig, zowel op het gebied van het aantal criminele activiteiten, als het veiligheidsgevoel dat burgers hebben kunnen wijken onderling verschillen. Het is dan ook goed mogelijk dat diverse fysieke- en sociale kenmerken van een wijk van invloed zijn op de wijkveiligheid. Om te onderzoeken of dit ook daadwerkelijk zo is, is de volgende onderzoeksvraag opgesteld: *"Welke socialeen fysieke factoren beïnvloeden de wijkveiligheid in de vijf grote steden van Overijssel, en welke type interventies kunnen worden aanbevolen om de wijkveiligheid op het huidige niveau te houden of te verbeteren?"* Om deze onderzoeksvraag te beantwoorden is gebruik gemaakt van diverse data, zoals de 'wijkscans', de veiligheidsmonitor en statistische gegevens uit Statline van het Centraal Bureau voor de Statistiek betreffende de vijf grote steden van Overijssel. Voor deze steden is gekozen omdat het werkgebied van de Universiteit Twente en de Saxion Hogescholen zich voornamelijk op dit gebied concentreert.

Om de diverse invloeden op wijkveiligheid te meten, is allereerst een breed theoretisch inzicht verkregen door diverse theorieën te verzamelen, waarbij het startpunt de 'Chicago school' theorie is. Al deze theorieën monden uit in 21 hypothesen, die zullen worden getest middels diverse partiële regressie analyses. Met behulp van deze regressie analyses is onderzocht welke factoren van invloed zijn op de wijkveiligheid, en welke factoren hier geen invloed op hebben. Binnen de diverse factoren wordt onderscheid gemaakt tussen fysieke factoren (afstand tot het centrum, de waarde van de woning en het percentage bewoonde woningen) en de sociale factoren (percentage Nederlandse inwoners, woonduur, sociale cohesie en participatie). Naast deze twee 'groepen' wordt ook de mate van 'schoon, heel en werkzaam' in acht genomen, wat is gemeten volgens de perceptie van de bewoners in de wijken. Voordat de daadwerkelijke statistische analyses worden uitgevoerd wordt het hedendaagse niveau van veiligheid in de 87 wijken gepresenteerd. Opvallend is dat de wijken onderling verschillen. Een 'algemeen veiligheidsniveau' is lastig te geven, maar Hengelo en Deventer hebben te maken met de grootste criminele activiteiten. Op het gebied van overlast scoren Enschede en Deventer het hoogst en het laagste veiligheidsgevoel wordt gemeten in Enschede. Dit impliceert dat de objectieve veiligheid en de subjectieve veiligheid in een wijk niet gelijk hoeven te zijn, wat eveneens wordt getest middels een partiële regressie analyse.

Op basis van de theorie wordt verwacht dat zowel de fysieke- als de sociale factoren van invloed zijn op de veiligheid in de wijken. De algemene verwachting is dat de fysieke factoren de wijkveiligheid zowel direct als indirect, via de sociale factoren, beïnvloeden. Als we kijken naar de uitkomsten van de analyses blijkt dat de objectieve veiligheid en de subjectieve veiligheid niet perse hetzelfde hoeven te zijn om het veiligheidsniveau in een wijk aan te duiden. De objectieve veiligheid wordt voornamelijk beïnvloed door de afstand en door het percentage bewoonde woningen, terwijl de subjectieve veiligheid vooral wordt beïnvloed door het percentage bewoonde woningen, het percentage aan autochtone inwoners, de sociale cohesie, de mate van participatie en het niveau van objectieve veiligheid) of via indirecte paden (subjectieve veiligheid). Het percentage van bewoonde woningen blijkt van belangrijke invloed op zowel de objectieve- als de subjectieve wijkveiligheid. Deze variabele is bovendien vatbaar voor beleid, wat niet het geval is voor afstand. Het percentage bewoonde woningen is dus een belangrijk aanknopingspunt voor beleidsmakers of onderzoekers om de wijkveiligheid op hetzelfde niveau te houden, dan wel te vergroten.

Omdat dit onderzoek is gebaseerd op de vijf grote steden in Overijssel, zijn de resultaten niet zomaar generaliseerbaar naar andere steden of andere stedelijke gebieden. Verder onderzoek kan zich richten op deze generaliseerbaarheid, evenals de mogelijkheden tot het verder generaliseren van diverse Amerikaanse theorieën op Nederlandse wijken. Dit onderzoek vormt een uitgangspunt dat de belangrijkste relaties laat zien tussen diverse fysieke- en sociale factoren en wijkveiligheid, waar onderzoekers en beleidsmakers op kunnen voortborduren.

Introduction and research question

Every person in the Netherlands wants to live in a peaceful and safe environment. Although municipalities strife for this ideal, the reality is commonly different. In the Netherlands there are many neighborhoods that have to deal with crime, deprivation or nuisance. The cause of these criminal and nuisance behavior can be found in the individual characteristics of persons, like psychological problems, economic deprivation, addictions, etcetera. However, these individual characteristics are not the only cause of unsafe neighborhoods. The neighborhood itself can cause disadvantage or a lack of social cohesion. Within the literature about neighborhood safety, a distinction is made between physical determinants and social determinants. Both determinants can influence the neighborhood safety or are related to the neighborhood safety. Research on this aspect is mostly done in (non-) European countries other than the Netherlands, so it is not sure whether these assumptions and relations are also applicable in the Netherlands. The purpose of this thesis is to give an overview of the related physical and social determinants in the Netherlands, that can influence, or cause, neighborhood safety. The research question follows this purpose:

Which social and physical factors influence neighborhood safety in 2012 in the main cities in Overijssel and what kind of interventions can be recommended to sustain or increase neighborhood safety?

To formulate an answer on the research question, the research question above is divided into three different sub-questions. With these three sub-questions the research project is structured and a suitable answer can be formulated on the main research question. The first sub-question gives an overview of the current level of objective and subjective safety within the different neighborhoods of the five main cities in Overijssel: Enschede, Zwolle, Almelo, Deventer and Hengelo. The second sub-question has the purpose of obtaining statistical relations between the social characteristics and physical characteristics of neighborhoods and the neighborhood safety. To answer this question, data is used from the CBS, the different municipalities (Wijkscans) and the 'Veiligheidsmonitor'. The third and last sub-question provides a practical application of the results from the previous questions. With the last sub-question recommendations are provided to design interventions that can increase neighborhood safety, not only on neighborhood level, but also on a level below neighborhood level. The sub-questions are formulated as follows:

- 1- What is the level of objective safety and the subjective safety in the neighborhoods in the main cities in Overijssel?
- 2- Which physical and social characteristics influence the objective and subjective safety in the neighborhoods in the main cities in Overijssel?
- 3- Which recommendations can be made to local and provincial government to develop interventions on neighborhood level to sustain or increase neighborhood safety?

Although the sub-questions provide different answers, there is one aspect they have in common. With all the information, offered by the sub-questions, variables and characteristics that are amendable to change will come up in front. This means that recommendations can be formulated so to policy makers can create interventions to reduce unsafe situations within the five cities of Overijssel. Furthermore, the data-analyses will give information about the possibilities to measure safety on a smaller geographical area. Although this is not a goal of this thesis, the recommendations will give the policy makers an opportunity to develop interventions on neighborhood level and on a small, but practical, level.

In short; this thesis is about neighborhood safety, whereby the determinants will be explained, based on the physical and social characteristics within a neighborhood that can influence neighborhood safety in a positive or negative manner. With the conclusions of this thesis, it is possible to develop interventions to enhance neighborhood safety in the five main cities in Overijssel.

Research aim

The aim of the research is to investigate in what way the social determinants and physical determinants influence the neighborhood safety. Based on this information input can be given for the development of interventions by policy makers. With this information on neighborhood level, policy makers and researchers can use this information to conduct research on a small geographical level, like housing blocks and street blocks. Furthermore, this thesis will give an overview of the neighborhood safety of 87 neighborhoods in Overijssel. This province is chosen because of the region where the University of Twente and the Saxion University of Applied Sciences are located. The outcomes of this thesis give an overview of the relevant characteristics of neighborhoods and the relation between those variables and the level of safety. With the acknowledgment of these relations, a policy maker is capable of taking decisions on neighborhood level and on the level beneath neighborhood level within a clear theoretical framework of tested theories. Besides, different theories based on neighborhood safety will be tested and applied to Dutch neighborhoods, so that current theories can be continued or supplemented with information from Dutch cities and Dutch neighborhoods.

Relevance of the research

Current research that is formulated around neighborhood safety, mostly focuses on the social characteristics or on the physical characteristics. In this thesis both characteristics will be used to determine what type of variables influences the level of safety in the five main cities in Overijssel. Furthermore, in this research different theoretical concepts that are developed in the United States or other non-European countries are applied to the Dutch cities. With the outcomes of these theories, it will be clear if 'early' theories can give input in the development and creation of 'safe cities and neighborhoods' in the Netherlands. Of course not all theories are suitable, but which theories are suitable will come up in front when the different hypotheses that are formulated will be tested.

In this thesis, data is used from the neighborhoods of the five main cities in Overijssel from the year 2012. With the results of the statistical analyses, an input can be given for interventions that are created on neighborhood level, and not only on the level of cities or provinces. This research reduces the literature 'gap' because the 'classical' research is based on cities, provinces or municipalities, and not on neighborhood level itself. Of course the neighborhoods in Overijssel are not the same as the neighborhoods in Noord-Holland or Brabant, but with the results of the analyses on neighborhood level, it is possible to test the same hypotheses in other provinces.

The results of this research will give input for policy makers and researchers to develop interventions to create 'safer' cities and neighborhoods. For researches, this thesis will give multiple recommendations for further research, or inputs for the creation of theoretical models and hypothesis, because 'classical' theories are tested on 'modern' cities and 'modern' characteristics of cities and neighborhoods. The results of the tested hypotheses can be applicable to other provinces, but not if the possible differences between different provinces are taken into account.

Outline of the thesis

This thesis starts with a short introduction of the main question and the main goals of this research. After this introduction chapter, the thesis starts with an overview of the complex theories of neighborhood safety. In this theoretical chapter the main theories of neighborhood safety are discussed and an overview will be given of the testable hypotheses that are formulated based on the literature. Furthermore, the different variables that can influence the neighborhood safety will come up in front and presented with the use of different figures. After this first chapter, the variables that can influence neighborhood safety and safety itself will be operationalized and the different research methods will be discussed with respect to the validity and reliability. After the discussion of the different research methods the hypotheses that are formulated in the theoretical chapter will be tested with the available data and with the use of partial regression analyses. Last but not least; an overall conclusion will be given where the main question and the different sub-questions will be answered on which recommendations will be formulated to conduct further research and to sustain or increase the level of neighborhood safety in the different neighborhoods.

1. The complex theory of neighborhood safety

In the Netherlands, there are many neighborhoods that can be seen as 'unsafe', 'bad' and 'asocial' (Wortley & Mazerolle, 2011). Citizens in these neighborhoods feel unsafe and their livability is low (Lub, 2013). Unsafe and unhealthy neighborhoods have multiple problems, like high unemployment, dilapidation and social segregation. All these problems are experienced by several municipalities in Overijssel and according to the municipality of Zwolle, the cumulative of all these kind of problems makes it difficult to tackle the problems and to reduce the unsafe feelings of citizens (Gemeente Zwolle, 2013). In neighborhoods with social- and physical problems, there is often a unsafe environment with a lot of crime, vandalism and nuisance. According to the city of Zwolle, safety can be described as the presence of acceptable protection of life, health, property, and protection against threats and attacks. However, this is not the only definition of safety that is widely known. In this section, the definition of safety will be explained, with respect to the physical characteristics and social characteristics that can influence the safety in Dutch neighborhoods. This chapter will give an overview of different complex theories that underlie neighborhood safety, starting with the one of the oldest theories; the theory of the Chicago school. This chapter comprises multiple models based on different theories and neighborhood characteristics that increase in complexity. The starting point of this chapter is the distance between a neighborhood and the commercial city center, which is the central point within the Chicago school theory. This theory then will be followed by other theories that insert different physical and social variables to the complex theory of neighborhood safety.

1.1 The Chicago school theory as starting point

The Chicago school theory can be seen a source of inspiration for a lot of recent theories with respect to neighborhood safety. The theory that was developed during the 1920's can be seen as a tradition within criminological theories and important findings (Wortley & Mazerolle, 2011). The Chicago school theory focuses on the neighborhoods and the characteristics of these neighborhoods, related to the number of criminal activities. One of the most important findings within the Chicago school theory, is the finding that neighborhoods that are closer to the city center, had to deal with a lot more criminal activities and disadvantages than the neighborhoods with a larger distance to the city center. Although the Chicago school theory was developed based on the experiences in the United States, according to Bernasco (2011) the different zones are similar and applicable to the Dutch cities and Dutch neighborhoods. Also in the Dutch cities that are examined by Bernasco, the most criminal activities took place in the city center or the zone around the city center. Based on the work of Bernasco (2011) and Blokland (1998) it is possible to explain neighborhood safety with respect to the theory of the Chicago school. Of course there are some differences between the United States and the Netherlands, like governmental planning, the use of landscape, etcetera. But according to different studies (Bernasco, 2011; Pauwels, Weerman, Bernasco & Volker, 2012) it is possible to apply the theory of the Chicago school on the Dutch cities when you take the possible ecological fallacy into account. Furthermore, most Dutch cities are not designed as perfect circles, so the location of the neighborhoods and the distance to the city center will vary when a comparison is made between different cities. The statistical data, on which the research of Bernasco and Blokland is based, is interpreted on neighborhood level, so it is not possible to apply these outcomes directly on individual level. The theory of the Chicago school can be seen as one of the most important starting points with respect to neighborhood safety, because it is also the starting point of other important theories, like the Crime Prevention Through Environmental Design (CPTED) theory, the routine activity theory and theory of opportunity. They will not be discussed in this thesis, because these theories are based on individual level or based on a smaller geographical level than neighborhood level. However, based on this information the theory of the Chicago school can be used in this thesis because it addresses the physical- and social characteristics of neighborhood safety. It is worth to explain the theory of the Chicago school further, with respect to the neighborhood safety as in its original ideas in the United States.

With respect to the original theory of the Chicago school, Burgess (1928) developed the theory, with respect to the original zoning of the cities, in Chicago and in other main cities in the United States. According to the Chicago school theory, the neighborhood can be divided in five different 'zones' which contains a specific type of citizens and a specific type of physical characteristics. Below, these five zones are listed.

- Zone 1; Business district with a lot of anonymous citizens and visitors
- Zone 2; Working district with the poorest citizens in rental houses
- Zone 3; Working district with working citizens within modest houses
- Zone 4; Upper district with 'rich' citizens within high valued houses
- Zone 5; Suburbs with 'rich' citizens in high valued housed or farms/companies

According to the theory of the Chicago school, the level of safety is the lowest in zone 2. However, according to Burgess (1928) within the Chicago school theory there is a natural process of invasion, which means that there is a natural movement from the inner zone to the outer zone. This means that citizens that can afford a 'better' house, move from zone 2 to zone 3 and from zone 3 to zone 4, etcetera. However, if citizens cannot afford a better house, they stay at their original zone. With respect to neighborhood safety, Wortley & Mazerolle (2011) state that the distance to the city center is related to the neighborhood safety. Based on the original theory, the distance to the city center can be seen as a 'good predictor' of neighborhood safety. However, the expectation is that not the distance itself determines the level of safety within a neighborhood, but that this relation is dependent on other variables such as physical and social indicators. In the figure below the starting point of this theoretical framework is presented, where the 'boxes' can be interpreted as variables that can influence the relation between the distance of the neighborhood to the city center, and the level of neighborhood safety. In the figure below, it is clear that the distance itself can influence the level of neighborhood safety, but there can also be intervening variables (for example V1 in figure 1) that can influence the neighborhood safety. Based on these assumptions, this chapter is constructed in such a way, that the different theories are presented from the wide part to the narrow part of the 'funnel'. In this case, the theoretical framework concerning neighborhood safety will increase in complexity when variables are added to the theoretical figure. The starting point of the theoretical figure is presented in figure 1, and concerns the distance a neighborhood is located to the city center of a municipality.



Figure 1: The relation between the distance and the neighborhood safety

As shown in the figure above, there can be many variables that influence the relation between the distance and the neighborhood safety. An important group of variables that are presented within the theory of the Chicago school are variables that are based on the physical characteristics of a neighborhood. Even though the general assumption is that criminal behavior of citizens is based on individual characteristics, Wortley & Mazerolle (2011) assign criminality also to the physical characteristics of a neighborhood. They state that if citizens move from zone 2 to another zone, they do not take their delinquency with them. "The lesson for the environmental perspective is that the social problems exhibit in zone 2 are features of the neighborhood conditions rather than inherent features of the individuals who reside there" (p.5). Based on this quotation, one can argue that there are some physical environmental characteristics within these zones that 'creates' an unsafe, criminal zone. One explanation of the creation of this unsafe zone is that zone 2 contains the cheapest houses,

compared to zone 3 and zone 4. According to Rovers (1995) properties with a low value or rented (social) building blocks are an 'invitation of crime', because houses are not secured, or houses are abandoned, which may increase the level of vacant dwelling within a neighborhood. The general assumption is that the distance influences the physical environment of the neighborhood and that these physical characteristics influence or determine the level of neighborhood safety. In the figure below (figure 2) this assumption is presented.



Figure 2: The relation between the distance and the physical characteristics

As shown in figure 2, the assumption is that the distance to the city center influences the physical characteristics of the neighborhoods. Of course this thesis is about the neighborhood safety in the main cities in Overijssel. However, as presented in figure 1, the distance can influence the level of neighborhood safety itself, but is can also influence neighborhood safety by intervening variables, such as the physical characteristics. In this section the relation between the distance and the physical characteristics will be discussed. The relation between the distance and the neighborhood safety and the physical characteristics and neighborhood safety will be discussed further on in this chapter. It was chosen to present the model in small steps, to increase the readability of this thesis and to present the theoretical model from a relative 'simple' model to a complex model.

Based on the information above hypothesis 1 can be formulated. According to the theory as discussed in the previous section, the physical characteristics that are important are the value of the dwelling and the percentage of non-vacant dwellings. Because this hypothesis consists of two dependent variables, the hypothesis can be divided in hypotheses 1.1 and 1.2. Of course, there are more physical variables that can be inserted in this thesis, but based on the information as presented in the previous section and the available data the value of the dwellings and the percentage of non-vacant dwellings will be presented. The assumption with respect to the distance and the physical characteristics is that if we compare zone 2 with zone 3 and 4 that both the value of the dwellings increase and the percentage of non-vacant dwellings will rise, if the distance to the city center increases. In this assumption the city zone is excluded from the theory and the data-analyses, because the visitors of these commercial centers are commonly visitors of other places. The physical characteristics that other visitors bring up to that zone. So, in this thesis the city center will not be involved in the data analyses and a comparison will be made between zone 2, zone 3 and zone 4.

Hypothesis 1:	
If the distance to the city center increases, the value of dwellir	gs (1.1) and the percentage of non-vacant dwellings (1.2)
increases	
L	

As already noticed before, the assumption is that distance influences the physical characteristics and the neighborhood safety in a direct and indirect manner. However, the relation with neighborhood safety will be discussed further on in this chapter. If we take a look at figure 1, it is clear that the distance influence the neighborhood safety directly and indirectly via other variables. The physical characteristics for example are 'V1', the first of a number of intervening variables through which distance can have an effect on neighborhood safety. The following sections will be presented in the same manner, so per variable that can influence the relation between the distance and the neighborhood safety. The neighborhood safety itself will be discussed in the last section of this chapter.

1.2 The social composition of the neighborhoods

In the previous chapter, the relation between the distance and the physical characteristics are discussed, because it is likely that these two variables can influence the neighborhood safety. However, the assumption is that the distance doesn't only influence the physical characteristics, but also the social composition of the neighborhood. In this section, the variables will be discussed that can influence the social composition of neighborhoods. The relation between the social composition of the neighborhoods and the level of safety will be discussed later in this chapter, because the neighborhood safety is at the right of the funnel of causality, as presented in the first figure.

As already discussed, the distance to the neighborhood is an important factor affecting the physical characteristics of neighborhoods, based on the theory of the Chicago school. However, because zone 2 contains the cheapest houses, this zone will also contain the poorest people and immigrants that are living in the cheaper (social rental) housings. These citizens are another invitation of crime, because citizens with no job or low educational level are 'isolated' and within large building blocks there is a lack of 'knowing the neighbors' (Rovers, 1995). This assumption shows that the demographic structure (also called the 'social composition') of the neighborhood can also play an important role within the relation between the 'distance' and 'neighborhood safety'. Bernasco (2011) argues with respect to this assumption that the demographic characteristics are based on the age of the citizens, the number of one-parent families, the percentage of ethnic minorities and number of low-income families, etcetera. As shown in figure 3, the assumption is that the distance to the city center influences the physical characteristics of neighborhood, but also determines the social composition within a neighborhood. However the demographic structure is also influenced by the physical structure of the neighborhood. This indicates that the distance can influence the social composition in a direct way (arrow 2 in figure 3) and in an indirect way via the physical characteristics (path: arrow 1 and arrow 3). This last statement is understood from the work of Bruinsma and Van der Bunt (1998) that indicates that the differences between neighborhoods, with respect to neighborhood safety, can be seen in two different 'directions'. Crime differences between neighborhoods can be seen in the light of 'demographic differences' and 'physical differences'. Based on the research of Bruinsma and Van der Bunt (1998), one can make a distinction between two different schools of thought within the theory of the Chicago school, in which the distance can be seen as a starting point. The first school of thought focuses on the relation between the distance and the physical characteristics, and the second school of thought focuses on the relation between the distance and the social composition. However, as Blokland (1998) argues, both schools of thought are related to each other, because the physical characteristics will mostly have an impact on the social composition within a neighborhood, as is shown in figure 3.



Figure 3: The relation between the distance, the physical characteristics and the social composition

The indirect relation of the distance on the social composition assumes that intervening variables are important with respect to neighborhood safety as we will discuss later on in this chapter. The assumptions that can be formulated based on the previous text are that the social composition can be divided in the percentage of Dutch native citizens and the residential stability in a neighborhood. In the next two sub sections, these two variables will be presented.

1.2.1 Cultural concurrence

The cultural concurrence of a neighborhood is an important variable within the social composition of a neighborhood when we take a look at the social safety theories. According to the theory of Wilson (1963) the more a neighborhood exist of native citizens, the more citizens feel safe and feel 'at home'. Of course, it is not a coincidence that native citizens live in particular

neighborhoods and that non-Western immigrants live in other neighborhoods. According to Michener (2013) citizens prefer to live in the neighborhood with neighbors that have the same ethnic background, within the possibilities they have. Some non-Western immigrants don't have the financial possibilities to live in the same neighborhood as family members, or other non-Western immigrants. In this latter case, the relation between the distance and the physical characteristics plays an important role, as already is discussed in the previous sections. The general assumption with respect to the cultural concurrence is that if the population of the neighborhood comprises with citizens that have a Dutch or a Western-European background, the more safety, social cohesion and participation there will be in that neighborhood. The relation with all those variables will be discussed further on in this chapter, where the social climate and neighborhood safety will be presented.

Based on the previous textual sections, the general assumption is that the non-Western immigrants live commonly in zone 2, because this zone has the cheapest houses or the most social rental apartments. If we formulate this assumption in the other way around, one can argue that the population of the Dutch native citizens will rise, if the distance to the city center increases. This is plausible, because Dutch citizens are more frequently living in high value dwellings, that are, as assumed in the previous section, located further away from the city center. This assumption will be presented in hypothesis 2.

Hypothesis 2:

If the distance to the city center increases, the proportion of the Dutch native population (2.1) and the residential stability (2.2) of that neighborhood increase.

1.2.2 Residential stability

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The other variable with respect to the social composition within a neighborhood is the level of residential stability. The residential stability is positively correlated with safety and social organization of the neighborhood, according to Michener (2013). In his research Michener argues that citizens that live a long period in the neighborhood creates strong ties with the neighborhood, experience a feeling of social control and experience a feeling of safety. Sampson, Raudenbush and Earls (1997) endorse this statement. They found that a low residential stability decreases the social control and increases the subjective unsafety. Sampson et al (1997) found a strong negative correlation with crime/nuisance and the residential stability. This means that the residential stability can be a dependent or an independent variable, as can be noticed further on in this chapter.

If we look back to the previous section, the theory of the Chicago school was presented with respect to the different city zones of neighborhoods. In this theory, the environmental characteristics of a zone are different compared with other zones. In the second zone, for example, the environment consists of social housing apartments and a low residential stability. The relevance of the residential stability with respect to neighborhood safety, is commonly based on the assumption that if citizens don't 'like' their neighborhood, they are less willing to cooperate with neighbors and they feel less safe, because there is less social control. The relation between the social composition and the distance is based on the assumption that citizens that live closer to the city center, are less likely to stay there for a long period, because they move to a better house and make the 'cycle of urban life' (Van Kampen, 2008). Because the homogeneity of neighborhoods and the residential stability are discussed separately, it is plausible to conclude that these variables are not related to each other. However, there is a relation between the residential stability and the intended results of the policy intervention 'social mixing'. The relation between the social mixing theory and the residential stability is that the social mixing theory creates the ideal neighborhood. The assumption is that citizens stay in that neighborhood because they have ties with each other and citizen's wants to stay in the area. Another important issue is that a high residential stability increases the level of participation within a neighborhood. However, the relation with participation and social cohesion will be discussed in the next section.

If we look back to the beginning of this section the variable 'social composition' is included in the theoretical model. Based on this model, as presented in figure 3, two different hypotheses can be formulated. Hypothesis 2 is already discussed, but in

the text box below, one can find hypothesis 3. The numbers of the arrows in figure 3 correspondent with the hypotheses as formulated in the text boxes above and below.

Hypothesis 3:

If the value of the dwellings and the percentage of non-vacant dwellings increase the proportion of the Dutch native population (3.1) and the residential stability (3.2) increase.

1.3 The 'social climate'; participation and social cohesion

As already noticed, the Chicago school theory can be seen as an important starting point. The distance, that is the most important variable within this theory, can influence the physical characteristics, the social composition but also the social climate. In this section we will focus on the two aspects of the social climate; the level of social cohesion and the level of participation within a neighborhood. The general assumption is that the social climate is influenced by the distance, the physical characteristics and the social composition. In this chapter, these relations will be presented, starting with the relation between the distance and the social climate.

1.3.1 The relation between the distance and the social climate

The general assumption within the different theories is that citizens that live nearby the city center, in social rental housing blocks, have the least social cohesion outside their housing block or street. According to Van Stokkom and Toenders (2010) citizens in these neighborhoods are strongly focused inward and contact with other ethnical groups and home owners are seldom. The assumption is that the neighborhood influences the social climate within a neighborhood, which exist of social cohesion and participation. There is, first of all a direct effect of distance on the social climate, (figure 4, arrow 4) where the assumption is that these variables are positively related. However, the assumption is that these influences are also indirect and that the physical characteristics of the neighborhood and the social composition within a neighborhood are the intervening variables. The relations between the variables distance, the physical characteristics and the social composition are already discussed in the previous sections.

As one can see in figure 4, it is clear that the distance influence the social climate in a direct way. But more likely is the influence of the intervening variables from the physical characteristics and the social composition. In which way these variables can intervene will be discussed in the next two sections. All relations however, are already presented in figure 4, where the numbers correspond with the formulated hypotheses.

1.3.2 The relation between the physical characteristics and the social climate

In the previous section, the relation is discussed between the distance and the social climate in a neighborhood. However, it is likely that the physical characteristics influence the level of social cohesion and the level of participation in a direct way. The assumption is that in areas with a lot of vacant dwellings or social rental houses, neighborhoods produce little new information. Of course citizens talk to each other more often than in neighborhoods with high secured and private houses, but the lack of new information ensures social fragmentation, which discourage the contacts with citizens of other neighborhoods and the willingness to participate. The contact with other citizens is seen as an important indicator of the level of social cohesion within a neighborhood. This means that the physical characteristics of the neighborhood, like the value of dwelling and the percentage of non-vacant dwellings are positively related to the level of social cohesion and the level of participation within the neighborhood. This relation is present without the assumption that intervening variables plays an important role, as we can see in figure 4 (arrow 5). But of course, it is more likely that intervening variables plays an important role via the two variables of the social composition, which will be discussed in the next section.

1.3.3 The relation between the social composition and the social climate

Next to the distance and the physical characteristics of neighborhoods, the social composition, as discussed earlier in this chapter, can also influence the level of social cohesion and the level of participation within the neighborhood. According to Power and Willmot (2007), the strength of ties citizens have with the neighborhood depends on the residential stability, but

also on the 'grouping' of citizens with the same cultural background. This is an important statement, because the strength of ties is one of the most important indicators of social cohesion, but social cohesion involves more than 'just' community ties. According to the work of Kearns and Forrest (2000), social cohesion comprises shared norms and values in the community, social solidarity, social control, networks and a feeling of belonging to each other and to the neighborhood. However, according to Van Kempen (2008) the social cohesion can also be on high level within low-income neighborhoods and neighborhoods with a high ethnical homogeneity. This because these citizens have more contacts within the neighborhoods compared with citizens in high-income neighborhoods. Lower income families need survival strategies that the neighborhood can offer, because they do not have the financial opportunities to travel elsewhere. An important statement is that the neighborhood itself, or the community they live in, is not for every person equally important. The socioeconomic position of families determines if people create a bond with the community. For low-income families, immigrants or low-educated persons the neighborhood can make a difference in a positive sense (support, social contacts) or in a negative sense (development of deviant norms, deprivation and isolation). This last point addresses the relation between one aspect of the social composition and the social climate (figure 4, arrow 6).

The other variables that fits within the social climate of the neighborhoods, is the level of citizens participation. Participation in this research is seen as voluntarily involvement in programs that have a direct impact on the local community, membership in (sports) associations and political participation. According to Michener (2013), citizens that want to participate in (social) intervention programs within their neighborhood, feel a greater sense of satisfaction then citizens that don't want to participate. Participation thus can be seen in relation with 'social cohesion' since participation in associations is positively related to the ties a citizen creates with the community and the neighbors within the community. Because of the ties that are developed by participation, the residential stability will be medium-high to high. Due to this residential stability, citizens feel more involved and want to participate (Leidelmeijer, 2012). According to Beenackers, Kamphuis, Burdorf, Mackenbach & Van Lenthe (2011) not all citizens want to participate to develop their own contacts or skills. In their research, Beenackers et al. argues that only elderly, unemployed and low-income citizens want to participate. Not to make a neighborhood more livable, but purely to keep their social benefits. This assumption, however, is contradicted by the research of the municipality of Heiloo, who refers to the relation between participation and neighborhood safety that will be discussed further on in this chapter.

The general assumption in this section is that the social composition will influence the social climate in a positive manner. This means that if the residential stability increases, the level of social cohesion and the level of participation will increase. Of course this assumption is plausible, because the social climate is mainly based on the feelings of citizens and the ties citizens have with the neighborhoods. In the figure below, all relations are presented with the focus on the social climate in the neighborhoods. In this figure, it is clear that the social climate is influenced by the distance, the physical characteristics of a neighborhood and the social composition of that neighborhood. For now, the social climate will not influence other variables, although this will change further on in this thesis. In the first part of this chapter, a 'funnel' is presented that shows the relation between the distance and the neighborhood safety. With the figure below (figure 4) a first step is made toward the end of this funnel, where the physical characteristics, the social composition and the social climate will be the intervening variables.



Figure 4: The influence of the 'distance'

In the figure above, the hypotheses 1 till 6 are presented with the use of arrows between different variables. In this section, multiple relations are discussed, but it is important to realize that the main accent will be on hypothesis 6; the relation between the social composition and the social climate. The other relations and hypotheses are still present in this thesis, because they can be very helpful to determine which variables plays a direct or an indirect role with respect to neighborhood safety.

Hypothesis 4:

If the distance increases, the level of social cohesion (4.1) and the level of participation (4.2) will increase.

Hypothesis 5:

If the value of dwellings and the percentage of non-vacant dwellings increase, the level of social cohesion (5.1) and the level of participation (5.2) in that neighborhood will increase.

Hypothesis 6:

If the residential stability and the proportion of Dutch native citizens increase, the level of social cohesion (6.1) and the level of participation (6.2) in that neighborhood will increase.

In the previous sections, the relations between distance, the social composition, the physical characteristics and the social climate are presented. In the next sections, the relations of these variables with neighborhood safety will be presented. However, before the relation with neighborhood safety will be presented, another variable will be included in this theoretical framework first. The variable cleanliness is seen as an important indicator of neighborhood safety. First the variables that are already discussed in the previous sections will be related to cleanliness and later on the objective and subjective safety of neighborhoods will be included.

1.4 The influence on cleanliness

In the previous sections the first part of the model that presents the relation between distance and neighborhood safety is presented. However, there are more variables that are related to level of safety within neighborhoods. The level of cleanliness, for example, is such an important variable. The level of cleanliness in this chapter will be presented from the point of view of the 'broken window theory. The broken window theory indicates a relation between the number of reported crime, the social disorganization of a neighborhood and the number of vacant houses in a neighborhood (Wilson & Kelling, 1982). When the neighborhood shows disinterest by the lack of maintenance, then, according to Wilson & Kelling, crime will

rise because the neighborhood shows a lack of interest in the livability and subjective safety of citizens. According to this theory, the physical characteristics within a neighborhood are important with respect to neighborhood crime as well as the number of graffiti and other kinds of degradation. So if there is degradation, crime will rise. This phenomenon is related to the social control (one aspect of the social climate) that is mostly absent in areas with weak physical characteristics. The most important aspect of those physical characteristics is the value of vacant dwellings, because the assumption is that vacant dwellings attract criminal behavior (Wilson & Kelling, 1982).

The level of cleanliness will be determined by variables that can determine if a neighborhood scores high on the level of degradation or not. The level of degradation is commonly measured by the use of a couple of indicators, such as graffiti on walls and buildings, garbage on the streets, dog mess and vandalism (Gemeente Enschede, 2012). However, because of the readability of this thesis, the level of degradation will be measured in a positive way. This means that we will measure the cleanliness of the neighborhood. According to Kelling and Wilson (1982) low physical characteristics of neighborhoods are invitations to commit crime. These characteristics are commonly present in zone 2 of the city, which can indicate that the distance influence the level of cleanliness. The assumption is that if the distance to the city center increases, the level of cleanliness will also increase. But because the physical characteristics itself plays also an important role and in that case the assumption is held that if the physical characteristics of a neighborhood rise, the cleanliness of the neighborhood will increase too. Since the social composition, like the ethnical homogeneity and the residential stability can influence the level of degradation - or cleanliness - by 'caring' the neighborhood, the neighborhood doesn't radiate a 'lack of care' (Wilson & Kelling, 1982). Potential criminals will not be invited to commit crime or other deviant or violent behavior. This means that social composition of the neighborhood will influence the level of cleanliness. The assumption is that the social composition will influence the level of cleanliness. The assumption is that the social composition will influence the level of cleanliness. The assumption is that the social composition will influence the level of cleanliness in a positive manner, so if the social composition increase, the level of cleanliness in the neighborhood will increase too.

Next to the physical characteristics and the social composition, the social climate of the neighborhood can also be involved in the theoretical framework. According to Van Stokkom and Toenders (2010) the presence of social cohesion can deter potential criminals of violent or criminal behavior. If the neighborhood doesn't have to deal with a lot of crime, like graffiti and destruction, than the level of cleanliness will rise, which also indicate a positive relation. In figure 5 below, the relations between the level of cleanliness (as dependent variable) and the other variables are presented. In the figure it is clear that the level of cleanliness in this model is influenced by other variables, but doesn't influence variables itself. Of course, the level of cleanliness will influence the neighborhood safety, but this relation will be discussed further on in this chapter. The assumption is that the distance, the physical characteristics, the social composition and the social climate will influence the level of cleanliness are presented with arrows. Of course, many indirect relations via these variables will influence the level of cleanliness also, but because of the readability of this thesis and the figure, these relations will not be presented with the use of arrows in this figure. However, if one wants to see these indirect relations, then figures 1 till 4 should be checked, because these figures show these indirect relations that are not presented in this figure.



Figure 5: The independent variables with respect to the level of cleanliness

In the figure above, the variables are presented that will influence the level of cleanliness. The numbers on the arrows corresponds with the formulated hypotheses. Of course the variables will influence each other, but these relations are already discussed in previous sections in this chapter. In the text box below, the hypotheses 7 till 10 are formulated, where the dependent variable exists of the level of cleanliness.

Hypothesis 7:

If the distance increases, the level of cleanliness in the neighborhood will increase.

Hypothesis 8:

If the value of the dwellings and the percentage of non-vacant dwellings increase, the level of cleanliness will increase.

Hypothesis 9:

If the residential stability and the Dutch native population increase the level of cleanliness will increase.

Hypothesis 10:

If the level of social cohesion and the level of participation increase then the level of cleanliness will increase.

The main question of this thesis is "which variables are influencing neighborhood safety". Till now, the relations between different variables are only presented to each other, but not in relation with neighborhood safety. To present the relations, between the current variables and neighborhood safety, a first step will be made in the next section. In this section a beginning will be made with the relation to the objective safety of neighborhoods. In the last section of this chapter, the relations will be presented with respect to the level of subjective safety within a neighborhood.

1.5 The objective safety in neighborhoods

In all the previous sections, the variables 'safety', 'objective safety' and 'subjective safety' are rough. Neighborhood safety, or safety itself, is a complex and dynamic word with a lot of definitions and characteristics. Safety is widely known as the protection against (external) influences, but also the feeling of being protected against these influences (Breetzke & Pearson, 2014). Safety has to deal with 'real' threats, like crime and accidents, and with the 'feelings' of threat. These two elements of safety are not only important on individual level, but also on the level of municipalities and neighborhoods. According to Zimring (2012), the safety aspect in neighborhoods can be divided into two different sections; objective safety and subjective safety. Objective safety is based on 'real' safety, also called the evidence-based section of safety. Objective safety is mostly

measured by police reports, indexes and other analyses. Although these measurements are evidence-based, safety has to deal with a lot of dark number issues. This means that objective safety can never be totally clear. The second section of safety is the subjective safety that is based on the safety feelings of citizens. This section is based on the experiences of citizens, the opinion of citizens and the feelings of citizens within the neighborhood or environment. The subjective safety in the neighborhood is commonly measured on individual level by the use of surveys and in-depth interviews. Although there is a distinction between objective safety and subjective safety, these two elements need to be combined with respect to level of safety in neighborhoods (Zimring, 2012). Both objective and subjective safety are important for the overall safety in the neighborhood, but it is not necessary that these two aspects of safety have a logic relation. It is possible that the objective safety in a neighborhood is high (or low) and that the subjective safety is low (of high). In this section the neighborhood objective safety will be discussed. The subjective safety will be discussed in the next section.

As already discussed prior to this section the distance and the physical characteristics are related to the number of crime and vandalism. But individual and social characteristics of citizens that live in the neighborhood also play an important role (Zimring, 2012). Variables, like the value of the dwellings and the absence of social control, can influence the number of reported crime and nuisance. The assumption is, that if social control is absent, perpetrators don't experience any barrier to conduct violent and criminal behavior (Wilson & Kelling, 1982). Also the level of cleanliness of the neighborhood is related with objective safety, because citizens report nuisance and 'small criminal' activities to the local police, if they recognize this behavior as abnormal. However, one of the assumptions of the broken window theory is that neighborhoods with a low level of cleanliness have to deal with a high number of reported crime and reported nuisance. This means that the level of cleanliness influence the level of objective safety within a neighborhood (Wilson & Kelling, 1982). The assumption in this case, is that the distance, the physical characteristics, the social composition, the social climate and the level of cleanliness will play an important role with respect to the objective neighborhood safety. Between all those variables, a positive relation will be expected. In the figure below, one can see the different variables that can influence the level of objective safety within a neighborhood. Also in this figure, the numbers on the arrows correspondent with the numbers of the hypotheses that are shown in the text box below. In this figure, only the direct causal relations are presented with arrows. The indirect relation, which are also present with respect to the objective safety, are not presented with the use of arrows due to the readability of this figure. However, as said before. If one wants to see the indirect paths that are not presented in this figure, the figures 1 till 5 should be checked. These figures present the indirect paths that are not presented in this figure due to the readability.



Figure 6: The relations between different variables and the objective safety

In figure 6 all relations are made clear with respect to the objective safety within neighborhoods. In this model, the assumption is that the objective safety is only influenced by other variables, and doesn't influence variables itself. Of course the objective safety in the neighborhoods will influence the level of subjective safety in that same neighborhood. This relation will be discussed in the next section. In the text box below, the hypotheses 11 till 15 are formulated, again the numbers of the hypotheses correspondent with the numbers on the arrows in figure 6.

Hypothesis 11:

If the distance increases, the level of objective safety will increase.

Hypothesis 12:

If the value of dwellings and the percentage of non-vacant dwellings increase, the level of obbjective safety will increase.

Hypothesis 13:

If the residential stability and the percentage of Dutch native citizens increase, the level of objective safety will increase.

Hypothesis 14:

If the level of social cohesion and the level of participation increase, the level of objective safety will increase.

Hypothesis 15:

If the level of cleanliness increases, the level of objective safety will increase.

The complexity of neighborhood safety is presented in this section on the basis of the objective safety within a neighborhood. All variables that can explain or influence the objective safety are included in the discussed sections and figures. As already noticed before, neighborhood safety not only consists of the objective safety and reported crime, but also of the feelings of safety from the citizens that are living in that neighborhoods. The general consumption is that the objective safety influence and determines the level of subjective safety. However, this relation can also be spurious, because, as we will see in the next section, it is possible that citizens in an objective safe neighborhood don't feel safe or other way around.

1.6 The explanation of neighborhood subjective safety

As discussed in the previous section, there are a lot of variables that can explain the level of objective safety in neighborhoods. Subjective safety however, can only be explained by other variables and doesn't influence other variables on its own. The general assumption is that the level of subjective safety is dependent from the level of objective safety. This assumes that there is a positive relation between those two variables. But of course, other variables can also influence the level of subjective neighborhood safety.

Different theories indicate that some variables are more directly related to the subjective safety than with the objective safety. For example; the level of cleanliness is important for the level of subjective safety within a neighborhood. Greenberg et al. (1982) indicates that citizens with low feelings of safety frequently live in social rental housing blocks, nearby the city center and within a zone with a lot of vacant houses and anti-social behavior. In these zones, mostly unemployed and undereducated citizens live together. These groups see what kind of criminal activities happen on the street and experience a feeling of unsafety. Within this living area, according to Blokland (1998) social control is commonly absent, although citizens 'see' what happens on the streets. Low educated citizens cannot place criminal behavior in the context of the society, so they do not recognize if certain behavior is 'undesirable' or 'normal'. This is also the case with the recognition of visitors. Low-educated citizens are not able to recognize well-willing visitors or potential perpetrators (Lochner, 2004). This last statement indicates that physical characteristics and social determinants can be related to each other with respect to subjective neighborhood safety. When we go back to cleanliness itself, it seems clear that a clean neighborhood can cause subjective

feelings of safety. Citizens or visitors that visit a 'non-clean area' experience the degradation and feel uneasiness because the neighborhood radiates a 'disinterested' and 'criminal' ambiance (Breetzke & Pearson, 2014). But empirically underwritten, this statement is not fully correct. For example the 'Red light district' in Amsterdam contains a lot of criminality and signs of degradation but citizens feel safer than in other comparable neighborhoods in Amsterdam (Flight, 2005). This last statement indicates that the relation between objective safety and subjective safety is not always as clear as it seems. However, in this theoretical framework, some variables can be seen as indicators of neighborhood subjective safety. General assumptions in this thesis that will be tested later on are that if the distance, the physical characteristics, the social composition, the social climate and the level of cleanliness increase the subjective safety within a neighborhood will increase.

Most familiar within in scientific literature is the relation between the level of the social climate and the subjective safety. If people have ties with the community the assumption is that social control is present and citizens feel safe, because they can see perpetrators and people can see them if something (criminal) happens. The level of participation within a neighborhood is positively related to the perceived safety feelings of citizens (Gemeente Utrecht, 2010). The municipality of Utrecht argues; "when citizens participate actively in neighborhood programs, volunteering and other activities, they perceive a positive feeling of safety. Participated citizens also experience less crime, less nuisance and are more willing to report crime". These findings are also present in the work of Michener (2013). Participation has a positive influence on the trust in government, the creation of social relations and the trust in other citizens (Michener, 2013). This means that citizens that participate in programs feel safer because they trust their neighborhoods and the police department of that neighborhood. Although most research refers to the positive relation of participation and neighborhood safety, there is also research that refers to a negative or an absent relation between participation and neighborhood safety. According to Zimring (2012) participation is commonly based on the individual characteristics of a citizen, and not on the level of social capital or other social characteristics. This means that participation is not directly related to neighborhood safety at all. This is also the case in the research of Beenackers, Kamphuis, Burdorf, Mackenbach & Van Lenthe (2011) that refers to the fact that participation of citizens is related to demographic factors like age, income, etcetera. In their research, Beenackers et al. argues that only elderly, unemployed and low-income citizens want to participate. Not to make a neighborhood more livable, but purely to keep their social benefits. This assumption, however, is contradicted by the research of the municipality of Heiloo, who refers to the relation between participation and neighborhood safety. According to this research of the municipality, participation also includes the reporting of offenses to the local police. Elderly, unemployed and low-income citizens are frequently home, so they experience and perceive a higher level of crime and nuisance than citizens who have a day-time job. So to say, participation can have a positive influence on the neighborhood safety, but not all of the researchers that were investigating this relationship agree on that point. In this thesis however, the assumption that the level of participation influence neighborhood subjective safety will hold. In the figure below, the relations with respect to subjective safety are made clear. The numbers on the arrows correspondents with the number of the hypotheses that are formulated based on the textual section above and are presented in the text box below. It is clear that the level of subjective safety is influenced by a lot of variables that are all discussed in the previous sections, what brings us the end of the 'funnel'. Subjective safety itself doesn't influence other variables that are related to the level of safety in neighborhoods.



Figure 7: The relations between different variables and the subjective safety

In the text box below, the last hypotheses are presented that are formulated based on the information in figure 7. As already noticed the numbers on the arrows in this figure correspondents with the numbers of the hypotheses. In this last section, the relation between the objective safety and the subjective safety is the central idea, but to see whether the other variables plays a direct or an indirect role, all hypotheses that are presented will be tested in chapter 5. Of course, in the figure above, only the direct causal relation are presented with arrows. The indirect relations via other variables are not drawn in this figure. To see these indirect paths, please check the figures 1 till 6, where these indirect paths are presented.

Hypothesis 16:

If the distance increases, the level of subjective safety will increase.

Hypothesis 17:

If the value of dwellings and the percentage of non-vacant dwellings increase, the level of subjective safety will increase.

Hypothesis 18:

If the residential stability and the percentage of Dutch native citizens increase, the level of subjective safety will increase.

Hypothesis 19:

If the level of social cohesion and the level of participation increase, the level of subjective safety will increase too.

Hypothesis 20:

If the level of cleanliness in a neighborhood increases, the level of subjective safety will increase.

Hypothesis 21:

If the level of objective safety increases, the level of subjective safety will increase.

Based on all figures and tables in this chapter, one can make 21 hypotheses in total that will be tested further on in this thesis. All hypotheses that are formulated in this chapter are presented in text boxes. In the table below, the assumed relations are presented based on a table. Within the table, the dependent and the independent variables are presented, where the independent variable will be influenced by the dependent variable(s). The table starts with a simple model (M1) that shows the relation between the distance and the physical determinants of the neighborhood. The assumption is that the distance influences the physical characteristic in a positive way (if the distance increase, the value of dwellings and the percentage of non-vacant dwellings will also increase). A positive sign (+) indicates an assumed positive relation and a negative sign (-) indicates an assumed negative relation. The numbers presented in the table, refer to the related hypothesis. So every hypothesis is presented in the table. The assumed relations, on which this table is based, will be tested in the next chapters with the data from the five main cities in Overijssel. Of course there are more hypotheses possible within this theoretical framework, but due to the limited data and time this research will only focus on the hypotheses that are formulated in this chapter.

		M1	M2	M3	M4	M5	M6
Distance		+ (01)	+ (02)	+ (04)	+ (07)	+ (11)	+ (16)
Physical characteristic 1	Value of dwellings		+ (03)	+ (05)	+ (08)	+ (12)	+ (17)
Physical characteristic 2	Non-vacant dwellings		+ (03)	+ (05)	+ (08)	+ (12)	+ (17)
Social composition 1	Dutch native citizens			+ (06)	+ (09)	+ (13)	+ (18)
Social composition 2	Residential stability			+ (06)	+ (09)	+ (13)	+ (18)
Social climate 1	Social cohesion				+ (10)	+ (14)	+ (19)
Social climate 2	Participation				+ (10)	+ (14)	+ (19)
Cleanliness						+ (15)	+ (20)
Objective safety							+ (21)

 Table 1: Assumed relations between different variables with respect to neighborhood safety

If we take a look back to the first figure that was presented in this theoretical framework one can see that the distance is related to the (objective and subjective) safety in a direct way, but that the distance is also related to safety via other variables. With the presentation of the table, as discussed above, we ended the framework at the end of the 'funnel'. With the presented variables and all relations, the assumption is that the distance can have a direct effect on neighborhood safety, but it is more plausible that this relation occurs due to the influence of the intervening variables, such as the physical characteristics, the social composition, the social climate and the level of cleanliness. In the next chapters, the variables will be operationalized, the data that is used will be presented and the hypotheses will be tested. At the end of this thesis the final conclusions will be drawn with respect to this theoretical framework.



Figure 8: The relation between distance and safety

2. Operationalization

Because this thesis is focused on neighborhood safety, it is important to define a 'neighborhood'. In the Netherlands, there are many local areas that are seen and called 'neighborhoods'. For this research, a neighborhood is seen as a geographic area as mentioned in the 'wijkscans' of the municipalities of Enschede, Zwolle, Deventer, Almelo and Hengelo. In these five cities, there are 87 geographical areas that can be seen as neighborhoods and are recognized as neighborhoods by the municipalities and the CBS. The neighborhoods, which are presented in a map (attachment 1) have clear boundaries, so in this thesis these clear, and recognized, boundaries will be sustained. In this chapter, all variables as discussed in the previous chapter will be operationalized, with as starting point the distance of the neighborhood to the city center.

2.1 Distance

The starting point of the theoretical framework, the distance to the city center, is the theory of the Chicago school. According to this theory, the neighborhoods that are closer to the city center have to deal with more unsafe situations than neighborhoods with a greater distance to the city center. To measure the distance from the neighborhood to the city center, a map of the regarding municipality will be used. The starting point from the measurement is the middle point of the neighborhood. The distance in meters (based on the map of the municipality) will be measured from the middle point of the neighborhood to the middle point of the city center. Based on the outcome of this measurement, one can say if the neighborhood is in zone 1, zone 2, etcetera. The two middle points (one of the neighborhood and one of the city center), will be determined based on the geographical map of the municipality and not on the street design. It is possible that some neighborhoods can be attributed to two different zones, based on the neighborhood is used as the starting point of the measurement. According to the theory of the Chicago School, neighborhoods that are closer to the city center are more amendable for the occurrence of crime and nuisance. On the next page, a sample is shown from the measurement of the distance from two neighborhoods in Enschede to the city center of Enschede.

It is possible that a neighborhood belongs to two different zones. In that case, the neighborhood will be assigned to the zone were more than 50% of the neighborhood belongs to. The operationalization is based on different research in the field of the Chicago school theory, mostly based on the city zones in Chicago or other Non-European countries. However, in two different research, this operationalization is applied to the Dutch cities. The city zoning in this thesis is divided as follows:

Zone 1: City Center/Business district (0 meters) Zone 2: Poorest citizens (1- 1000 meters) Zone 3: Workers within modest houses (1001 – 2000 meters) Zone 4: One step above zone 3 (2001 < meters)

As already mentioned, the distance between the neighborhoods and the city zones are measured from the 'middle point' of the neighborhood, as shown in the sample on the next page.



Figure 9: Example of the measure of 'distance'

According to the theory of the Chicago school, neighborhood 7 (Horstlanden, Veldkamp, Getfert West) has to deal with more safety problems than neighborhood 27 (Wesselerbrink Noord-Oost), because neighborhood 7 is established closer to the city center than neighborhood 27. As one can see in figure 9, the line is measured from the middle point of the city center to the middle point of the neighborhood.

2.2 The physical characteristics

The physical characteristics of neighborhoods can be divided in the 'value of dwellings' and in the percentage of 'vacant dwellings'. Both variables are derived from the 'veiligheidsmonitor' and 'CBS Statline data'. The value of the dwellings is seen as 'given' by the municipalities. The percentage of vacant dwelling is also given by the municipalities. However, to test the hypotheses it is important to 're-scale' this variable to get 'positive' relations. The 'new' variable is measured as follows: *100 - % of vacant dwellings*. With this 'new' variable, not the percentage of vacant dwellings is measured, but the percentage of non-vacant dwellings.

2.3 The social composition

As discussed in the theoretical framework, the social composition of a neighborhood consists of the ethnical homogeneity of the neighborhood and the residential stability within the neighborhood. Both variables are based on information from the 'veiligheidsmonitor', the 'wijkscans' of the municipalities and the CBS data about the municipalities. The residential stability in this thesis is seen as a 'given' variable and is based on the average period citizens live in that neighborhood.

The percentage of Dutch native citizens is measured in a different way. As starting point, the average distribution between non-Western immigrants and autochthons is used from the five big cities in Overijssel. This average is compared with the

distribution within a specific neighborhood. To get a 'new' variable, the following formula is used; Average percentage of non-Western immigrants of all municipalities – percentage of non-Western immigrants from the neighborhood. The 'new' variable can be positive or negative. If a neighborhood 'scores' positive on this variable, then there is homogeneity of autochthons. If a neighborhood scores negative, then there is a homogeneity of non-Western immigrants. A perfect 'mix' is impossible with this data, because in the municipalities in Overijssel, the average percentages of non-Western immigrants is lower than in the municipalities of Amsterdam or Rotterdam. So a 'perfect' mix of 50% autochthons and 50% of non-Western immigrants is not realistic within this area of research. This is why the choice is made to compare the different neighborhoods with the average of the five main cities in Overijssel. If a high score of homogeneity of autochthons is received, the percentage of Dutch native citizens will be high.

2.4 The social climate

In the theoretical framework, the social climate is divided in the level of social cohesion within the neighborhood and the level of participation within the neighborhood. The level of social cohesion in this thesis is measured by the use of a scale score (0-10). This scale score is based on four statements that indicate the social cohesion in a neighborhood. The higher the score, the more social cohesion is present in the neighborhood. The four statements are formulated as follows:

- 1- The people in the neighborhood do know each other¹
- 2- The citizens in the neighborhood go well with each other
- 3- I live in a nice and cozy neighborhood with a lot of solidarity
- 4- I feel at home in this neighborhood (ties with the neighborhood)

Each neighborhood is awarded with a score, based on these four statements. With this score, a comparison can be made between the different neighborhoods and the average scale score of the municipality. The score on the social cohesion level can be put in statistical formulas to compare the neighborhoods or to say if the level of social cohesion is in relation to other variables based on correlations, regressions or other statistical formulas.

The level of participation within a neighborhood is based on the percentage of citizens that is willing to participate in (social) interventions, in political associations or in sports associations. The percentage per neighborhood is based on the different 'wijkscans'. This variable can be seen as a given variable, because the percentages of the neighborhoods are taken from the different 'wijkscans' and each level of participation is measured in the same way. This makes the different neighborhoods comparable.

2.5 Cleanliness

The level of degradation within a neighborhood can be seen as an important indicator of different variables, neighborhood objective safety and neighborhood subjective safety. The level of degradation of the neighborhoods is measured using a scale (0-10) that is developed by the 'veiligheidsmonitor'. The scaled score is based on four different neighborhood problems that are commonly present in each neighborhood. The higher the score on the degradation scale, the more deprivation and degradation is present. The four neighborhood problems, on which the scale is based, are:

- 1- Graffiti on walls and buildings
- 2- Garbage on the streets (public and private areas)
- 3- Dog mess
- 4- Vandalism on telephone cells, bus shelters and street lights.

It is important in this case to realize that a low score (0) means that there is no degradation and a high score (10) means that there is a lot of degradation within a neighborhood. This is the opposite of the social cohesion index, where a high score is a

¹ This question is reversed and originally formulated in a negative way 'the people in the neighborhood don't know each other'.

'good' thing and a low score a 'bad' thing. Because the level of degradation will result in negative relations with other variables, the variable 'degradation' will be changed to the variable of 'cleanliness'. This variable will be measured by the following formula; *cleanliness* = 10 - degradation score.

2.6 **Objective safety**

As discussed in the previous chapter, neighborhood safety can be divided in objective safety and subjective safety. The objective safety is commonly measured by the reported criminal activities and nuisance to the local police. The data in this thesis is derived from the 'wijkscans' and the 'veiligheidsmonitor' from the different neighborhoods. These two documents, however, use the data from the police of the municipalities. The number of criminal activities and the number of nuisance is given as a 'ratio' indicator. This means that the number (ratio) is based on the number of citizens, so the number of reported criminal activities are measured per 100 inhabitants per year. For example; the neighborhood Laares in the municipality of Enschede scores 13.60. This is the number of reported criminal activities in 2012 per 100 inhabitants. The criminal activities and the nuisance that are taken into account in this thesis are listed in attachment number 2.

Nuisance in the neighborhood is based on the number of citizens as well, which means that the displayed number is the number of reported nuisance per 100 inhabitants. Also this number is retrieved from the 'wijkscans' and 'veiligheidsmonitoren'. Nuisance in the 'wijkscan' is based on nuisance of local citizens, wanderers, youth and other persons that are present within the boundaries of the neighborhood. To indicate if the number (ratio) of reported criminal activities and reported nuisance is high or low, a comparison will be made by the average number of the five cities. The average number of reported criminal activities and reported nuisance in the five cities is 29,04.

2.7 Subjective safety

The subjective safety of citizens within the neighborhood is based on the percentage of citizens that feel unsafe and the percentage of citizens that experience threat within their neighborhood. Although threat is also an indicator of objective safety, the experience of threat can be seen as subjective. The experience of threat in this case is not reported by the police. The subjective safety of citizens is measured using the data of the 'veiligheidsmonitor' (also indicated in the wijkscans). The percentage of the neighborhood citizens that feel unsafe, answered the question "Do you feel unsafe in your own neighborhood" with 'yes'. It is important to realize that the percentage is based on the number of participants of the 'veiligheidsmonitor' and not on the 'real' number of citizens. However, because the bottom-line of participants is 30% per neighborhood, the validity and reliability of the conclusions, that will be drawn from this data, can be maintained. The percentage of the different neighborhoods will be compared with the average score of the five cities in Overijssel, so it is possible to say if the percentage of citizens that feel unsafe is a low percentage or a high percentage.

However, in this thesis the level of subjective safety is explained as a positive 'variable'. This means that not the level of citizens that feel unsafe will be taken into account, but the percentage of citizens that actually feel safe in his or her neighborhood. To determine the 'new' variable, the following formula is used; 100 – percentage that feel unsafe. The outcome of this formula is the percentage of citizens within a neighborhood that actually feels safe. Based on this variable, the level of subjective safety can be placed in connection with the other variables, that are already operationalized in this chapter.

With this operationalization and the use of the data on which the operationalization is based, a lot of threats to the validity and reliability may emerge. What these threats mean with respect to this thesis and with respect to the conclusions that can be drawn in this thesis, will be presented in the next chapter.

3. Research design and methodology

3.1 Research design

For the preparation of this study, different research methods were used to obtain the information that is needed to conduct this research. The first method that is used is the so-called deskresearch. Relevant literature is used to develop a theoretical framework and to compose several hypotheses. To test the hypotheses that are formulated based on the theoretical framework, different data is collected by the use of the 'Veiligheidsmonitor', the 'Wijkscan' and data from the CBS (Centraal bureau voor de Statistiek). In the next sections, general information from the 'veiligheidsmonitor' and the 'wijkscans' will be given and the threats to the validity and reliability will be discussed.

3.1.1 Veiligheidsmonitor

The 'veiligheidsmonitor' is an annual research in the Netherlands based on safety, livability and victimization. Furthermore, information is gathered about deprivation, nuisance, normless behavior, measurements, trust in the local police and the safety policies in the municipality. Citizens are at random invited to join the written survey about the safety issues. The data that are collected from the citizens is evaluated with the same methodological approach. Because the same approach is used for all the 'veiligheidsmonitoren' the data is usable to draw conclusions that combine several municipalities. This increases the validity and reliability of the research. For the municipalities, it is not required to join the 'veiligheidsmonitor'. But the five main municipalities of Overijssel are joining the 'veiligheidsmonitor' for several years. Because it is not obligatory to join the 'veiligheidsmonitor' some groups can be eliminated from the research (elderly citizens or citizens that have a day time job). This can be an important threat to the validity and reliability of this research. However, the specific threats to the reliability and validity based on the 'veiligheidsmonitor' will be discussed further on in this chapter.

3.1.2 Wijkscan and CBS data

Next to the veiligheidsmonitor, information is collected from the 'wijkscans' of the municipalities. These wijkscans are conducted by I&O research, a research institute that investigates the livability, number of reported crime and the social cohesion within a neighborhood. Also the information in the wijkscans is measured with one method for all municipalities, what increase the validity and reliability of the research. The data that is used within the wijkscans is commonly collected from other surveys in the neighborhoods or from police reports. These surveys and reports will influence the reliability and validity of this thesis. The threats of these wijkscans to the validity and reliability, will also be discussed later on in this chapter. Because the wijkscans don't give all relevant information that is needed to test the hypotheses, the data of the wijkscans will be complemented by information that is gathered from the CBS and Statline. The collected data consists information about the demographic structure of the neighborhoods, like the number of citizens, the number of non-Western immigrants, the number of young (15-25 years) citizens and the number of social rental apartments.

3.2 Case selection

The neighborhoods that are used for this thesis, are all part of the five big cities in Overijssel; Enschede, Zwolle, Hengelo, Deventer and Almelo. These cities are chosen because of the working areas of the Saxion University of Applied Sciences and University of Twente. To make sure enough data is available for this thesis all neighborhoods in these five main cities are included. However, some neighborhoods didn't have a good enough response percentage on the 'veiligheidsmonitor'. Neighborhoods that had a response percentage below 30% are excluded within this thesis, because these neighborhoods can be a threat to the validity and reliability when conclusions are drawn based on limited available data. The five main cities of Overijssel contain together 87 neighborhoods with a response percentage of 30% or higher. These neighborhoods differ from small to big neighborhoods, but all these neighborhoods do have available data within 'wijkscans' or 'veiligheidsmonitorn'.

3.3 Data collection and testing the hypothesis

In this section, the methods for testing the twenty-one hypothesis will be explained, with respect to the dependent and independent variables and the development of the theoretical model. Furthermore, the data that is used for testing the hypothesis will be presented and the levels of significance will be explained. The threats to validity and reliability will be discussed further on in this chapter.

As we saw before in this thesis, twenty-one hypotheses were formulated to test whether the social- and physical characteristics of the neighborhoods can influence the level of safety. To test these relations, different variables with respect to these social- and physical characteristics are selected from different scientific literature. In the table below, the variables are presented that will be used to explain neighborhoods safety by the use of social- and physical characteristics. The operationalization of these variables is already discussed in the previous chapter, but in this chapter the data that is used for these variables are included also. In the table below, it is clear that different databases are used. For some variables, such as the objective safety, multiple databases are used. In the case that these databases are not the same, the data from the wijkscan is used, because the wijkscan contains information of multiple surveys and multiple research that is conducted by the municipalities.

Table 2: Used data per variable

Variable	Data
Distance	Map24 and maps of the municipalities
Value of dwellings	CBS data
Non-vacant dwellings	CBS data
Ethnical homogeneity	CBS data
Residential stability	Wijkscan
Social cohesion	Wijkscan
Participation	Veiligheidsmonitor
Cleanliness	Wijkscan
Objective safety	Wijkscans and veiligheidsmonitor
Subjective safety	Wijkscans

Based on the deskresearch, which was presented in the first chapter of this thesis, twenty-one hypotheses are formulated that are tested with the statistical software program 'SPSS'. The data that is used to create a 'data file' is taken from the databases as presented in the table above. Because all hypotheses suggest a specific relation between two or more variables, partial regression coefficients were computed on the basis of multiple linear regression analyses. The results of the partial regression analyses give the amount by which the dependent variable increases when the independent variable increases by one unit and all the other independent variables are held constant. Especially the last point is important, because the influence of variables can only be measured when intervening variables and other variables are held constant, so they cannot influence the relation of the dependent and the independent variable.

Of course, the statistical results needs to be significant to give a conclusion based on the statistical output of the partial regression analyses. The level of significance that is chosen for this thesis is p = 0.10 (one-sided) or p = 0.05 (two-sided). The level of significance in this case depends on the formulation of the hypothesis. This level of significance is chosen to measure if the statistical outcomes of the regression analyses are not significantly different from zero. If the outcome of the analyses is close to zero, the relation can be based on coincidence. If the outcomes of statistical regression analyses don't fit the level of significance it is hard to draw conclusions based on these outcome because the results cannot be reliable.

Next to the level of significance the variance inflation factor (VIF) is important, because this research is based on multiple independent variables that can influence the dependent variable but also each other. When the VIF score is high (above 10) then there is an indication for multi-collinearity. This means that the variables are strongly related to each other and that they overlap each other. When this is the case, the reliability of the regression coefficients will decrease drastically. If the

results of the regression analyses in this thesis score 10 or higher on the VIF index, the results will not be presented in this thesis.

If we go back to the 21 hypotheses that are formulated, the statistical material and the outcomes of the different regression analyses, then there are multiple threats to the validity and the reliability that may emerge. These threats will be discussed further on in this chapter. First we will take a look at the aggregation problem that can occur when research on neighborhood level will be conducted, while safety is experienced on a smaller geographical area.

3.4 Aggregation problem

As already discussed, this thesis is based on the neighborhoods in the five big cities in Overijssel. Although neighborhoods are an important geographical area, citizens live in smaller units than the neighborhood addresses. Citizens live, and experience safety, within a couple of housing blocks or a couple of streets. This doesn't mean that research on neighborhood level is wrong, invalid or untrustworthy. However, it does mean that some assumptions are made on a different level of aggregation. In this research, conclusions will be made based on the available data on neighborhood level. This means that there are some limitations on the conclusions that will be drawn, if you want to predict (subjective) safety on a smaller geographical area.

Within neighborhoods, there are many smaller geographical areas with specific characteristics. These geographical areas can have different levels of social of physical characteristics. For example; in this research, the amount of criminal activities is measures on neighborhood level while criminal activities and nuisance take place on specific places in the neighborhoods, the so called 'hotspots'. This means that statements are based on an average crime level and an average social cohesion number of the neighborhood and that the specific hotspots remain outside the analyses. The same problem is present within the predictions and statements about income, value of dwellings and the amount of rental housings. On neighborhood level, an average number is measured, while in smaller geographical areas the number of rental dwellings, the income level or the value of dwellings is higher (or lower) than in a greater geographical (neighborhood) level.

The choice to invest crime, nuisance and social cohesion on neighborhood level is a deliberate choice. Small social and small geographical areas and 'hotspots' have a small amount of citizens, which will result in little available information. This little available information makes it difficult to draw conclusion without biases and strong influences of extreme observations. Furthermore, the data that was available for this thesis is formulated on neighborhood level. As already said before, this data doesn't make this research untrustworthy or invalid, but some marginal notes should be kept in mind. Research on a higher level of aggregation also means that one can see an overall picture of the five different cities in Overijssel, without unnecessary complexity. This research makes neighborhoods comparable, without focusing on the many hotspots in some of the neighborhoods. Because this thesis is about the level of safety on neighborhood level, the aggregation problem in this thesis will only occur when individual data or data based on small geographic areas will used in the theoretical framework. Because this thesis is based on neighborhood level, it is not possible to apply the outcomes of the regression analyses on smaller geographical areas or on individual citizens.

Next to the aggregation problem about the living area of citizens, another important aggregation problem is about the individual results of survey's or individual measured data. Most data that is used in this thesis, such as subjective safety or cleanliness, is measured on individual level while the data is tested on neighborhood level. This means that the conclusions that are drawn on neighborhood level are less detailed than conclusions on individual level. However, the aggregation from individual data to data on neighborhood level makes the complex theories more feasible for researches and this research in particular. Furthermore, the individual datasets were not present, so it is not possible to test individual data. The different hypotheses are tested with the average individual data that is aggregated to data on neighborhood level. Because all the data is aggregated in the same manner, the threats to the validity and reliability are small. Because all the variables are measured on neighborhood level in this thesis, it is possible to compare these variables without possible negative effects of the aggregation problem.

The data used for this thesis is thus based on neighborhood level and not on individual level. This makes it impossible to conclude some statements about individual citizens within these neighborhoods. Because individual data is not available, the data on neighborhood level is chosen to test the different hypotheses.

3.5 Threats to validity and reliability

As said before, with every research, every database and every survey that will be conducted, threats to the validity and reliability will emerge. In this section, these threats will be presented and discussed with respect to the interpretation of the results of the regression analyses in this thesis.

The first threat to the validity and the reliability of this thesis is the use of the Veiligheidsmonitor and the Wijkscans. Both databases are based on the willingness of citizens to participate in these surveys. Of course the willingness to participate is not equally in every neighborhood. The result of this is that some neighborhoods score higher (or lower) on some variables because of the limited respondents and the characteristics of those respondents. For example, it is possible that citizens that feel safe in the neighborhood are more willing to participate within a survey than citizens that don't feel safe. The score on the subjective safety index will be higher based on the limited respondents than that every citizen participates within the particular research or survey. However, to decline this problem, only neighborhoods with a response percentage of 30% or above are included in this thesis. Furthermore, it is possible that not all respondents read the questions in the surveys in a good manner, which can result in interpretation errors. Because the 'veiligheidsmonitor' and the 'wijkscan' are written by research institutes like I&O research, it is also possible that the interpretation errors occur when researcher interpret answers of completed surveys by citizens.

Threats to the validity and reliability can also take place within the data based on police reports of the local police. It is possible that some police districts reports the same delinquencies on different manners. This can influence the numbers of specific crime rates or specific crimes. Furthermore, when we use police reports, the high dark number plays an important role. Because this dark number is also present in this research, the number of crime or the numbers of nuisance can be much higher as presented in this thesis. Of course this dark number is present in every municipality, but it is not sure if these dark number issues are equally important in every city. Because the dark numbers are not preventable, the data of the police reports will still be used in this thesis. Because reports of victims are not present, the dark number cannot be completed or compared with victim surveys.

In this thesis it was chosen to conduct partial regression analyses to test the different hypotheses. These regression analyses have a great advantage; the results give the amount by which the dependent variable increases when the independent variables increases and all the other independent variables are held constant. However, compared to this advantage, there are also some disadvantages. It is possible that the independent variables are related to each other which can influence the results of the regression analyses. This disadvantage however will be limited by the use of the VIF score below 10. Then the relation between the independent variables will be at minimum. Furthermore the results of regression analyses are dependent from the sample, in this case the 87 neighborhoods that are chosen for this thesis, which makes it hard to apply the outcomes on other samples.

Although these threats are important to notice, they don't make this research 'weak' or 'unreliable'. By conducting a VIF score below 10 and a significance score of 0.05/0.10 the errors within the statistical analyses will be limited. Furthermore, by drawing the conclusions, the threats to the validity and reliability will be taken into mind so these threats will not be ignored in this thesis. Furthermore, in the previous section the aggregation problem was already mentioned. This problem, and the possible negative effects of this problem, will also be kept in mind when conclusions will be drawn.

4. The level of neighborhood safety in the main cities of Overijssel

In the first chapter of this thesis, a theoretical framework is developed to gain information about the possible relations between social and physical indicators and neighborhood safety. Neighborhood safety suggests that there is always a specific level of safety within the different neighborhoods in the Netherlands. This is also the case for the neighborhoods in the five main cities in Overijssel. In this chapter, the current level of safety in these neighborhoods will be discussed with respect to both objective and subjective safety. The information in this chapter will give an answer on the first sub-question from the main question, which is formulated as follows: *'What is the level of objective safety and the subjective safety in the neighborhoods in the neighborhoods in the main cities in Overijssel?'*

The objective safety in the different neighborhoods is, as already discussed in the previous chapters, measured with the use of data from the 'veiligheidsmonitor' and 'wijkscans'. Mostly, these data is gathered from the local police departments, so there could be a high 'dark number'. Nevertheless, in this chapter information is given about the current level of objective safety within the neighborhoods of the five main cities in Overijssel. The subjective safety, however, is collected from the 'veiligheidsmonitor'. This means that the level of subjective safety depends on the participants of the survey, and not of all citizens in the neighborhood. In the table below, one can find the average number of reported crime, the average number of reported nuisance and the average percentage of citizens that feels safe in the five main cities. It is important to notice that all numbers of reported crime and reported nuisance are presented per 100 inhabitants. Behind the name of the city, the total number of neighborhoods within that city is presented between brackets. The numbers that are presented in the brackets on the columns 'crime' and 'nuisance' are the total numbers of reported crime and nuisance.

Table 3: Average	number of	reported	crime,	nuisance	and	reeiings	ΟΤ	satety	per	CITY	

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City		Crime	Nuisance	Feelings of safety
Enschede	(30)	18,284 (548,54)	13,526 (405,79)	77%
Hengelo	(10)	21,515 (215,15)	10,883 (108,83)	85%
Almelo	(12)	12,498 (149,98)	12,031 (144,37)	83%
Deventer	(15)	26,699 (400,49)	12,677 (190,16)	80%
Zwolle	(20)	10,220 (204,40)	10,980 (219,60)	82%

In table 3, one can see that in Deventer and Hengelo, the most criminal activities are reported to the local police and in Zwolle the least criminal activities are reported. This doesn't mean that these cities are unsafe or safe, but this indicates the willingness to report criminal activities to the police or the willingness of the police itself to detect and report criminal activities. If we take a look at the level of nuisance, then Enschede and Deventer scores 'high'. This can indicate that these cities are more attractive to nuisance, but it can also indicate that the citizens of Enschede and Deventer are more willing to report this nuisance. However, the perceived level of nuisance is dependent from the residential background of the citizens. If someone is used to nuisance, for example drug nuisance, and he or she moves to another city with less nuisance, then it is clear that the 'old' neighborhood contains a lot more nuisance. But if someone moves to the same neighborhood and he or she is used to a nuisance rate of zero, than this person thinks the neighborhood has to deal with a lot of nuisance.

The level of subjective safety is the highest in Hengelo (85% feel safe) and the lowest in Enschede (77% feels safe). This table make clear that the objective safety and subjective safety are not always 'in line' with each other. If we take a closer look at the available data, it is clear that in all cities, the neighborhoods that are located closer the city center have to deal with the most reported number of crime and nuisance. In the table below, an overview is given from all the neighborhoods, where the number of reported crime and the number of reported nuisance are presented. The letters 'C', 'N' and 'F' correspond with 'Crime', 'Nuisance' and 'Feelings of safety'. As one can see, the level of crime, nuisance and the feelings of safety are very different per neighborhood. This means that it is plausible that environmental characteristics or social characteristics determine the level of safety within neighborhoods.

Table 4: Overview of neighborhood safety

City	Neighborhood	C	N	F	Neighborhood	C	N	F
	Aadorp	8,35	9,14	97%	Wierdense hoek	14,00	15,14	77%
	Noorderkwartier	11,12	12,30	91%	Nieuwstraat/kwartier	14,96	13,17	64%
A	Schelfhorst	14,00	15,20	86%	Ossenkoppelerhoek	16,31	12,86	78%
Aimeio	Sluitersveld	10,76	16,14	82%	Windmolenbroek	12,36	14,93	75%
	Hofkamp	8,12	8,35	92%	De Riet	15,31	10,63	85%
	Binnenstad	22,00	12,95	77%	Bornerbroek	2,69	3,56	96%
	Binnenstad	44,78	17,65	78%	Colmschate – Z	24,76	14,65	82%
	De Hoven	28,60	16,45	83%	Diepenveen	18,35	9,57	84%
	Zandweerd	51,56	20,54	72%	Bathmen	15,79	8,65	85%
Dovontor	Voorstad	52,60	28,46	69%	Schalkhaar	13,78	9,56	81%
Deventer	Rivierenwijk	38,65	16,54	75%	Lettele	10,78	4,47	90%
	Borgele/Platvoet	27,46	12,56	80%	Okkenhoek	7,46	1,46	84%
	Keizerslanden	26,80	10,57	79%	Colmschate-vijfhoek	15,47	9,57	79%
	Colmschate -N	23,65	9,46	75%				
	City	155,18	46,99	60%	Schreurserve/Ribbelt	10,46	12,54	78%
	Lasonder/"t Zeggelt	31,67	17,44	71%	Stokhorst	5,55	12,15	86%
	Laares	13,60	13,82	70%	Glanerbrug	9,33	12,92	84%
	De Bothoven	34,30	20,73	78%	Eekmaat	6,07	9,58	91%
	Hogeland –N	31,67	17,44	71%	Cromhoffsbleek	13,19	10,45	70%
	't Getfert	16,67	10,16	67%	Boswinkel	10,72	11,52	63%
	Horstlanden	18,80	9,82	77%	Pathmos	17,78	11,72	83%
Enschede	Tubantia	7,86	13,12	87%	Stadsveld	13,76	8,85	76%
	Roombeek	14,32	13,16	76%	't Zwering	4,30	8,67	79%
	Twekkelerveld	12,76	11,67	74%	Stroinkslanden – N	6,78	14,25	84%
	Bolhaar	7,37	15,87	87%	Stroinkslanden – Z	7,49	12,89	82%
	Mekkelholt/Deppenbroek	11,19	11,39	77%	Wesselerbrink -NO	17,12	13,78	69%
	Business en Science	19,74	6,99	90%	Wesselerbrink –Z0	7,40	7,02	75%
	Velve-Lindenhof	15,13	13,31	72%	Wesselerbrink – ZW	10,64	13,44	67%
	Wooldrik/Hogeland-Z	11,85	12,62	89%	Helmerhoek	5,84	11,48	74%
	Binnenstad	38,34	16,47	71%	Berflo Es	34,57	16,45	78%
	Hengelose Es	23,89	13,18	81%	Wilderinkshoek	28,15	10,45	87%
Hengelo	Noord	22,40	12,89	85%	Woolde	17,45	9,75	87%
	Hasseler Es	13,18	8,45	88%	Slangenbeek	12,34	7,38	94%
	Groot Driene	13,15	7,46	86%	Buitengebied	11,68	6,35	89%
	Binnenstad	44,10	18,13	77%	Geren	2,90	12,57	87%
	Kamperpoort	17,20	16,14	78%	Buitengebied-Z	5,30	15,78	61%
	Veerallee	6,60	13,15	67%	Holtenbroek	9,70	7,49	87%
	Dieze-Oost	9,80	15,23	72%	Wipstrik	4,60	12,80	89%
Zwolle	Dieze-West	14,40	15,23	77%	Buitengebied-N	19,00	12,80	89%
20000	Indische Buurt	7,00	12,16	84%	Buitengebied-O	19,00	11,98	89%
	Assendorp/Hanzeland	10,20	13,46	83%	Stadshagen	2,60	1,89	89%
	Schelle	4,10	6,58	85%	Aa-Landen	4,90	7,65	82%
	Oldeneel	3,20	6,28	79%	Westenholte	5,90	3,45	86%
	Ittersum	4,90	8,16	85%	Berkum	9,00	8,67	91%

As already mentioned before, this chapter will give an answer on the first sub-question of this thesis, which refers to the current level of safety in the 87 neighborhoods in Overijssel. As we can see in the table, the level of safety is different in all neighborhoods. The average level of objective safety (reported crime and reported nuisance) is 29.73. This means that especially in Almelo, a lot of neighborhoods score above this number, which indicates that these neighborhoods score above the average number of crime and nuisance. However, this can be different if we take a look at the levels of subjective safety. Then we see that neighborhoods that score high on the number of objective safety (so there is a lot of crime and nuisance) can score low on the level of subjective safety. For example the neighborhood Wilderinkshoek; this neighborhood has to deal with a number of crime and nuisance above the average, but there are less citizens that feel unsafe in that neighborhood. This shows that the objective safety and the subjective safety are not always pointed in the same direction.

If we want to give an answer on the first sub-question, then it is very hard to explain the current level of neighborhood safety in the 87 neighborhoods in the five main cities of Overijssel. Every neighborhood has his own level of safety and furthermore, the objective safety and the subjective can be different in the same neighborhood. But, as already shown in the previous section, the municipalities Deventer en Hengelo are the least safe based on the level of the objective safety. The level of subjective safety is, surprisingly the highest in Hengelo, where the most criminal activities take place. The most citizens that feel unsafe in their neighborhood are living in the neighborhoods in Enschede, while not all neighborhoods show signs of criminal activities and nuisance. The current level of neighborhood safety in all municipalities is shown in table 4 on the previous page.

5. Data analyses and results

Based on the theoretical framework, a model was constructed in which the relations between neighborhood safety and the social and physical indicators are made explicit. In this chapter, the results of different analyses will be presented with respect to the relations between the physical- and social determinants and neighborhood safety. Based on the outcomes of the analyses, one can determine whether the dependent variables can be explained by the independent variables (or indicators). In this chapter, the different hypotheses, as formulated in the theoretical framework, will be presented. This means that all the relations between different variables will be explained and presented with the use of correlations and partial regression coefficients.

5.1 The Chicago school theory as starting point

In the theoretical framework, the Chicago school theory was used as a starting point of multiple theories with respect to neighborhood safety. In this first section, the relation is tested between the distance and the physical characteristics of the neighborhoods. The physical characteristics in this thesis are the value of the dwellings and the percentage of the non-vacant dwellings in a neighborhood. Based on the theoretical framework the first hypothesis that is formulated is *'if the distance to the city center increases, the value of the dwellings and the percentage of non-vacant dwellings increases.'* The hypothesis suggests that the distance influence the value of the dwellings and the percentage of non-vacant dwellings in the neighborhood. To test if there is a positive relation between the variables, the partial regression coefficients are presented in the table below. It is clear that both physical characteristics are positively related to the distance of the neighborhood.

Table 5: Partial regression analyses between thedistance and the value of the dwellings

	M1	Exp.
Distance	0.39	+
	0.00	
Value of dwellings		
R ²	0.15	
Adjusted R ²	0.14	

Table 6: Partial regression	analyses between the distance and the
percentage of non-vacant	dwellings

	M1	Exp.
Distance	0.16	+
	0.14	
Percentage of non-vacant dwellings		
R ²	0.03	
Adjusted R ²	0.02	

In tables above, the standardized coefficients indicate that there is a positive causal relation between the distance and the physical characteristics. The left table demonstrates the relation between the distance and the value of the dwellings. The table on the right demonstrates the relation between the distance and the percentage of the non-vacant dwellings in a neighborhood. As can be seen in the table, the distance influences the value of the dwellings more than the percentage of the non-vacant dwellings. The level of significance is also presented in these tables. The number below the bold numbers indicates the level of significance. The R^2 represents the percentage of the response variable variation that is explained by a linear model. The adjusted R^2 is the corrected version of R^2 with respect to the number of variables. The adjusted R^2 takes the number of entered variables into account, while the 'normal' R^2 doesn't. As one can see, the relation between the distance and the percentage of the non-vacant dwellings, isn't significant at all. This means that this relation can be based on coincidence. In the figure below, the influence of distance on the physical characteristics is presented. The regression coefficients are presented with respect to the other variable, but because the relation with the percentage of non-vacant dwellings is not significant, this relation is not presented in the figure below. In the figure below, it is clear that the distance influence the value of the dwellings with a coefficient of 0.39, which is a significant relation.



Figure 10: The partial regression coefficient between the distance and the value of the dwellings

According to the relation as presented above, the physical characteristics change when the distance to the city center increases or decreases. To visualize if the physical characteristics change when the distance increases, a distinction should be made with respect to the city zones. Because the assumption is that in zone 2 the most criminal activities occur, the value of dwellings and the percentage of non-vacant dwellings in zone 3 and 4 should be different than the value of dwellings and the percentage of non-vacant dwellings in zone 2. Because the value of dwellings and the percentage of non-vacant dwellings in zone 2. Because the value of dwellings and the percentage of non-vacant dwellings in zone 1 are commonly based on shops and restaurants, this zone is excluded in this chapter. In the table below, an overview is given from the average values of the dwelling and the average percentage of the vacant dwellings. It is clear that the value of the dwellings in zone 2 is lower than in zone 3 and that zone 4 contains the more expensive dwellings. The percentage of the Non-vacant dwellings also changes, but the differences between the different zones are small.

Table 7: Physical characteristics per city zone

	Value of dwellings	Non-vacant dwellings
Zone 2	165,82	94,68
Zone 3	172,33	95,04
Zone 4	244,19	95,71

If we go back to table 5, it is clear that the value of the dwellings is influenced by the distance by a coefficient of 0.39. The percentage of the non-vacant dwellings, however, is influenced by the distance by a coefficient of 0.16 (table 6). This last relation is not significant, which means that the percentage of the non-vacant dwellings is not influenced by the distance.

If we look back to the theoretical framework, Rovers (1995) stated that zone 2 contains the cheapest houses because in this zone the most dwellings are social rental apartments. Zone 3 contains the modest houses and zone 4 contains the more expensive houses, which can be confirmed based on the information in table 7. With respect to the percentage of the non-vacant dwellings, according to the theory this percentage should be high in zone 4 and low in zone 2, because citizens will leave zone 2 and move to zone 3 or 4 if they have the financial opportunities. But as we can see in table 7, this assumption is not confirmed based on the results of the partial regression analyses. So, the distance does influence the value of the dwellings in a significant manner, but not the percentage of the non-vacant dwellings. In chapter 1 the hypotheses 1.1. and 1.2 where presented in the following way *"If the distance to the city center increases, the value of the dwellings (1.1) and the percentage of the non-vacant dwellings (1.2) increase"*. Based on results of the partial regression analyses in tables 5 and 6, we can confirm hypothesis 1.1 and reject hypothesis 1.2. Because hypothesis 1.2 is rejected, it is possible to exclude the percentage of the non-vacant dwellings in this research because there is no significant relation. However, this is not preferable because it is possible that this variable will influence other variables if we insert more variables with respect to neighborhood safety. The relations with neighborhood safety will be discussed further on in this thesis.

5.2 The social composition of the neighborhoods

In the previous section the first hypothesis was tested where the relation between the distance and the physical characteristics of neighborhoods is determined. In this section the influences on the social composition will be clarified with respect to the distance and the physical characteristics. The social composition exists of the percentage of Dutch native citizens and the residential stability in a neighborhood. Hypothesis 2.1 and hypothesis 3.1 will be discussed first, followed by hypothesis 2.2 and 3.2. Hypothesis 2 is formulated as follows: *"if the distance to the city center increases the proportion of the Dutch native population (2.1) and the residential stability (2.2) of that neighborhood increases*.' Hypothesis 3 is also about the social composition within the neighborhoods *"if the value of the dwellings and the percentage of the non-vacant dwellings rise, the proportion of the Dutch native population (3.1) and the residential stability (3.2) will increase.*' Because hypotheses 2.1 and 3.1 discuss the relation with the percentage of the Dutch native citizens, these hypotheses will be discussed first. The hypotheses that discuss the relation with the residential stability (2.2 and 3.2) will be discussed in the next section.

5.2.1 The percentage of Dutch native citizens

The first parts of hypotheses 2 and 3 discuss the relation between the distance and the physical characteristics with the percentage of the Dutch native citizens within a neighborhood. In the section, we will start with the relation between the distance and the percentage of the Dutch native citizens, followed by the relation between the physical characteristics and the percentage of Dutch native citizens. If we looking at table 8 (Column M1), it is clear that a partial regression coefficient of 0.23 is present between the distance and the percentage of Dutch native citizens. If we looking at table 8 (Column M1), it is relation is significant, which means that, if other variables are excluded, the distance influences the first variable of the social composition. Based on the statistical information as presented in table 8, hypothesis 2.1 can be confirmed, which is also expected from the theoretical framework in chapter 1. This means that if the distance to the city center increases, the proportion of the Dutch native citizens will increase too.

		M1	M2	Exp.
Distance		0.23	-0.03	+
		0.03	0.06	
Physical characteristic 1	Value of dwellings		0.58	+
			0.00	
Physical characteristic 2	Non-vacant dwellings		0.12	+
			0.20	
R ²		0.05	0.36	
Adjusted R ²		0.04	0.34	

Table 8: Partial regression analyses between the distance, the physical characteristics and the percentage of Dutch native citizens

If we go back to the theoretical framework in chapter 1, it is clear that according to the theory zone 2 contains the cheapest houses, which also means that the most ethnical minorities that just started their 'circle of urban life' will live in this zone. This assumption indicates that also the physical characteristics of the neighborhoods – the value of dwellings and the percentage of non-vacant dwellings – will influence the percentage of the Dutch native citizens. This means that the distance is not the only independent variable. To see whether the physical characteristics will influence the percentage of the Dutch native citizens, we can take a look at column M2 in table 8. In this table it is clear that the physical characteristics will play an important role, because the adjusted R^2 rises from 0.04 to 0.34, which means that the percentage of the Dutch native citizens will be influenced for 34% by the distance and the physical characteristics. In column M2, the relation is presented between the distance and the percentage of the Dutch native citizens, including the two variables of the physical characteristics. The direct effect of the distance on the percentage of the Dutch native citizens is decreased to -0.03 on a significant level of 0.06. This means that the influence of distance only applies via the intervening variables of the physical characteristics. Especially the value of the dwellings plays an important role with respect to the percentage of native citizens in the neighborhoods. Of course is this not a surprising result, because the cheapest dwellings are commonly inhabited by ethnical minorities. To make the different significant relation in table 8 more clear, a figure is created where the significant relations are presented by the use of arrows. In this figure, only the significant results are included, so it is clear that the distance only influence the percentage of native citizens via the variable 'value of the dwellings'.



Figure 11: Significant relations between the distance, the physical characteristics and the percentage of native citizens

The figure above indicates that the physical characteristics influence the percentage of Dutch native citizens in a neighborhood more than that the distance influences the percentage of Dutch native citizens. The effect of 0.23 that is found in an earlier stage between the distance and the percentage of Dutch native citizens is thus an indirect effect via the value of the dwellings in a neighborhood. If we go back to the theoretical framework of chapter 1, this positive relation can be influenced by the presence of the social rental apartments in zone 2 and the cycle of life that Dutch native citizens make. According to Manley, Van Ham & Doherty (2011) non-Western immigrants are attracted by the social apartments in the city, because these citizens commonly don't have a paid job or have a low educational background. Furthermore, these citizens don't move to another zone after a couple of years, because they want to stay in the neighborhood with citizens that have the same ethnic background. This indicates that the concentration of ethnic minorities is high in zone 2 and low in zone 3 and 4. In other words, the concentration of Dutch native citizens is high in zone 3 and 4 and low in zone 2. The figure above suggest that the theory as presented in the theoretical framework can also be applicable to the neighborhoods in the five main cities in Overijssel. However, the assumption based on the theory is that the non-vacant dwellings also play an important role within the figure above. But there is no significant relation found between the distance, the percentage of the non-vacant dwellings and the percentage of the Dutch native citizens. This means that the distance only influence the percentage of the Dutch native citizens via the value of the dwellings and not via the percentage of the non-vacant dwellings. This means that hypothesis 3.1 can only be confirmed partially, because only the value of the dwellings will influence the percentage of the Dutch native citizens. In figure 11 the percentage of the non-vacant dwellings is not statistically important. However, as we will see later on in this chapter, the percentage of the non-vacant dwellings will play an important role with respect to neighborhood safety.

5.2.2 The residential stability

In the previous section, the first part of the social composition is presented by discussing hypotheses 2.1 and 3.1. In this section hypotheses 2.2 and 2.3 will be discussed with respect to the residential stability in the neighborhood. Hypothesis 2.2 suggest a positive relation between the distance and the residential stability in a neighborhood. As we will see in column M1 in table 9, this positive relation is present with a regression coefficient of 0.41 on a significant level of 0.00. This means that the hypothesis 2.1 can be confirmed and that the residential stability will rise if the distance increases if no other variables are involved. But as already discussed in chapter 1, it is plausible that the physical characteristics of neighborhood will also influence the residential stability. If we include the value of the dwellings and the percentage of the non-vacant dwellings (column M2 in table 9), the distance still influence the residential stability and the adjusted R² doesn't change. However, not all relations are statistically significant. The influence of the non-vacant dwellings and the value of the dwellings on the residential stability are not statistically significant, which means that the physical characteristics doesn't influence the residential stability. Based on this information and the statistical information as presented in table 9, hypothesis 3.2 cannot be confirmed.

Table 9: Partial regression analyses between the distance, the physical characteristics and the residential stability

		M1	M2	Exp.
Distance		0.41	0.36	+
		0.00	0.01	
Physical characteristic 1	Value of dwellings		0.16	+
			0.15	
Physical characteristic 2	Non-vacant dwellings		-0.07	+
			0.50	
R ²		0.17	0.19	
Adjusted R ²		0.16	0.16	

If we take a look at the theoretical framework as presented in chapter 1, we see that citizens in zone 4 have a higher residential stability than zone 2 or zone 3 because they cannot move to a 'further' zone. However, this assumption is not present in the five main cities in Overijssel. One explanation for this is that the non-Western immigrants live for a long period in zone 2, because they want to stay within a neighborhood with other citizens that have the same ethnical background. Furthermore, the distance to the city center plays an important role with the explanation of the residential stability. This indicates that citizens in zone 2 do not have the interest to move to zone 3. It is possible that, for example students or younger residents, will stay close to the city center because that is the place where the restaurants, shops, jobs, etcetera are present.

Based on the results it is clear that neither of these two physical characteristics influence the social composition within the neighborhood. This doesn't mean that the relation between the physical characteristics and the residential stability is excluded from this testing model, but the hypothesis that the physical characteristics influence the social composition can only be held partially. In the figure below, the relations are shown between the distance, the physical characteristics and the residential stability. It is clear that the distance itself influence the residential stability, but the physical characteristics doesn't influence the residential stability. So the influence of the intervening variables is very small and not significant.



Figure 12: Significant relations between the distance, the physical characteristics and the residential stability

The relations between the distance, the physical characteristics and the social composition are presented in the figure above. The relation between the value of the dwellings and the residential stability, which was assumed in the theoretical framework, is not statistical significant. This means that there is no causal relation between the value of the dwellings and the residential stability. The distance in this figure is important, because it influences the residential stability but it also influences the value of the dwellings. However, these three 'components' are not the only indicators of neighborhood safety. In the next textual section the social climate that exists of the level of participation and the level of social cohesion in a neighborhood, will be presented.

5.3 The 'social climate'; participation and social cohesion

As noticed in the previous section, the social climate of the neighborhood will be discussed further. The social climate in this case exists of the level of participation and the level of the social cohesion in the neighborhood. The assumption is that the social climate will be influenced by the distance, the physical characteristics and the social composition in the neighborhoods according to the theoretical framework. Based this theoretical framework hypotheses 4 till 6 are formulated and these hypotheses will be tested with statistical material. The hypotheses will be, as in the previous section, be divided in smaller hypotheses that will be discussed per variable. This means that in the first section hypotheses 4.1, 5.1 and 6.1 will be discussed with respect to the social cohesion. Further on in this thesis the hypotheses 4.2, 5.2 and 6.2 will be presented, where the level of participation will be the dependent variable. The hypotheses 4, 5 and 6 are formulated as follows: Hypothesis 4; 'if the distance increase the level of social cohesion (4.1) and the level of participation (4.2) will increase', hypothesis 5; 'if the value of the dwellings and the percentage of non-vacant dwellings increases the level of social cohesion (5.1) and the level of participation (5.2) will increase' and hypothesis 6: 'if the residential stability and the population of Dutch native citizens' increases, the level of social cohesion (6.1) and the level of participation (6.2) will increase.' As already mentioned before, in the next section the hypotheses will be tested with respect to the level of the divel of the next section the hypotheses will be tested with respect to the level of the next section the hypotheses 6.

social cohesion in the neighborhoods, followed by a section that will test the hypotheses as formulated above with respect to the residential stability.

5.3.1 The level of social cohesion

In this section, hypothesis 4.1, 5.1 and 6.1 will be presented and tested with the use of partial regression analyses. The results of these analyses can be found in table 10 where all variables are entered as discussed in the previous sections. The first assumption, based on the theoretical framework in chapter 1, is that the social climate in a neighborhood will be influenced by the distance. If we take a look at column M1 in table 10, it is clear that the distance and the level of social cohesion are positively related to each other on a significance level of 0.00 and an adjusted R^2 of 0.24. This means that the level of social cohesion is influenced by the distance for 24% if no other variables are involved. With this result hypothesis 4.1 can be confirmed, because if the distance will increase the level of social cohesion in a neighborhood will rise.

Table 10: Partial regression analyses between the distance, the physical characteristics, the social composition and the level of social cohesion

		M1	M2	M3	Exp.
Distance		0.50	0.33	0.31	+
		0.00	0.00	0.00	
Physical characteristic 1	Value of dwellings		0.40	0.15	+
			0.00	0.16	
Physical characteristic 2	Non-vacant dwellings		0.10	0.06	+
			0.26	0.47	
Social composition 1	Dutch native citizens			0.40	+
				0.00	
Social composition 2	Residential stability			0.10	+
				0.26	
R ²		0.25	0.41	0.52	
Adjusted R ²		0.24	0.38	0.49	

If we look at the theoretical framework in chapter 1, it is plausible that the distance influence the level of social cohesion in a neighborhood. In this framework, the assumption is presented that citizens who live near the city center in social rental apartments, have the least social cohesion outside their housing blocks or streets. This because these citizens are strongly focused inward with respect to their social contacts and their contacts with other ethnical groups is seldom (Van Stokkom and Toenders, 2010). This assumption seems to be underwritten by the statistical results, but this statement also suggests that the value of the dwellings and the percentage of non-vacant dwellings – which are low in zone 2 - will influence the level of social cohesion. Hypothesis 5.1, as formulated above, will test this relation.

Column M2 in table 10 show the partial regression analyses between the distance, the physical characteristics and the level of social cohesion. The distance, as discussed before, still influence the social cohesion in a positive significant manner, but the coefficient is decreased from 0.50 to 0.33. This means that the influence of the distance is also present via other variables. If we include the physical characteristics in the model it is clear that the value of the dwellings plays an important role that also explains the decrease of the influence of distance. The value of the dwellings in this case is the intervening variable. The percentage of the non-vacant dwellings is also positively related to the level of social cohesion, but this relation is not significant. In other words, the distance does influence the social cohesion in a direct way, but also in an indirect way via the value of the dwellings. The adjusted R^2 is 0.38, which means that the social cohesion is influenced for 38% by the distance and the physical characteristics.

If we take a look back at the theoretical framework, the general assumption is that the level of social cohesion is higher in neighborhood where citizens live in high valued houses. The percentage of the non-vacant dwellings, as shown in table 10, is not significant related to the level of social cohesion.

If we take a look at the theoretical framework, this result is not surprising. The assumption is that in areas where cheap (social rental) houses are located, neighbors produce little new information (Power and Willmot, 2007). Of course citizens talk to each other more often than citizens in highly secured neighborhoods but the lack of new information ensures social fragmentation what discourage contact with other citizens. Based on this information it is clear that hypothesis 5.1 cannot be confirmed completely, because only the value of the dwellings influences the level of social cohesion. The percentage of the non-vacant dwellings is not statistically significant.

Next to the distance and the physical characteristics, it is assumable that the social composition – the percentage of Dutch native citizens and the residential stability – can influence the level of social cohesion. The assumption is that neighborhoods with a high percentage of Dutch native citizens and a high residential stability have a high social cohesion. This assumption is presented and will be tested within hypothesis 6.1 which is formulated above. The relation between the social composition and the social cohesion is also presented in table 10 (Column M3). In this table it is clear that the influence of the distance decreases when more variables are entered. More surprisingly, however, is the decrease of the influence of the value of the dwellings and the strong influence of the percentage of Dutch native citizens on the social cohesion. However, it is not 'strange' that this relation is high, because neighborhoods with a high percentage of Dutch native citizens have more social contacts with each other and with the neighborhood. This is also discussed in the theoretical framework where Van Kempen (2008) argues that in neighborhoods were citizens live with the same ethnical background, the citizens are more willing to communicate with each other and perform (social) activities together. The residential stability, the other component of the social composition, is not statistically related to the level of social cohesion. This means that only the percentage of the Dutch native citizens will influence the level of social cohesion, so hypothesis 6.1 can only be confirmed partially.

In the table 10 it is clear that all variables together influence the social cohesion for 49% (adjusted R² of 0.49) but not all the presented relations are statistically significant. In the figure below, all significant relations are presented. In this figure there is a direct effect of distance on the level of social cohesion. Next to this direct effect, there are also two indirect effects. The distance also influences the social cohesion via the value of the dwellings and via the percentage of the Dutch native citizens. This means that the distance influence the social cohesion via three different significant paths.





In this section the hypotheses 4.1, 5.1 and 6.1 are presented and tested with respect to the level of social cohesion in a neighborhood. In the next section, the hypothesis 4.2, 5.2 and 6.2 will be presented with respect to the level of participation, the other component of the social climate. The hypotheses 4.2, 5.2 and 6.2 are already presented at the beginning of section 5.3.1.

5.3.2 The level of participation

As discussed earlier in this thesis, the social climate of neighborhoods exists of the level of social cohesion and the level of participation in neighborhoods. Hypotheses 4.2, 5.2 and 6.2 test the relation between the distance, the physical characteristics, the social composition and the level of participation. The first assumption is that the distance influence the level of participation as presented in hypothesis 4.2. The relation between those two variables is presented in table 11 column M1. In this column it is clear that the regression coefficient is 0.41 at a significance level of 0.00. This means that if the distance increases, the level of participation will increase too. However, the adjusted R² of column M1 is 0.16. This means that only 16% of the participation level is influenced by the distance. This assumes that other variables, such as the physical characteristics and the social composition, will influence the level of participation also. For now it is clear that based on this information hypothesis 4.2 can be confirmed.

		M1	M2	M3	Exp.
Distance		0.41	0.30	0.09	+
		0.00	0.01	0.33	
Physical characteristic 1	Value of dwellings		0.30	0.27	+
			0.01	0.01	
Physical characteristic 2	Non-vacant dwellings		-0.01	0.04	+
			0.90	0.64	
Social composition 1	Dutch native citizens			-0.11	+
				0.28	
Social composition 2	Residential stability			0.56	+
				0.00	
R ²		0.17	0.24	0.49	
Adjusted R ²		0.16	0.21	0.46	

 Table 11: Partial regression analyses between the distance, the physical characteristics, the social composition and the level of participation

If we look back to the theoretical framework in chapter 1, the positive relation between the distance and the level of participation is not suprising. According to Van Stokkom and Toenders (2010) citizens that live further away from the city center are more willing to participate, because they live longer in that neighborhood and because the houses are commonly from home owners, citizens are more willing to participate in programs that keep the neighborhood clean. This assumption also highlights the importance of the physical characteristics and the social composition in the neighborhood with respect to the level of participation. First we will focus on the relation between the physical characteristics and the level of participation, where hypothesis 5.2 will test the influence of the value of the dwellings and the percentage of the non-vacant dwellings. To test this hypothesis different partial regression analyses are performed which are presented in column M2 in table 11. From this table, it is clear that the distance influence the level of the participation within a neighborhood in a positive and significant manner (M1), which is already discussed in the previous section. However, if we include the physical characteristics in the model, the influence of the distance decreases. This decrease is caused by the influence of the intervening variable 'value of the dwellings' which influence the level of participation in a significant way. The percentage of the non-vacant dwellings is not significant related to the level of participation. In other words, the distance does influence the level of participation in a direct way, but also in an indirect way via the value of the dwellings. The value of the dwellings influence the level of participation also, while there is no relation between the percentage of the non-vacant dwellings and the level of participation.

Based on the results as presented in the table, we can take a look at the theoretical framework in chapter 1. In this chapter, the assumption was presented that citizen's that live in high valued houses and within a neighborhood of a high percentage of non-vacant dwellings, citizens are more willing to participate in activities and social programs. The first part can be confirmed because there is a strong relation between the distance, the value of the houses and the level of participation. The

level of non-vacant dwellings doesn't influence the level of participation. This doesn't mean that this variable is not important and will be excluded from the theoretical model because, as we will see later on in this chapter, this variable can influence other variables such as the level of safety. If we go back to table 11, the adjusted R² of the relation between the distance, the physical characteristics and the level of participation is 0.21. This means that these variables influence the level of participation for 21%. This means that hypothesis 5.2 can be confirmed based on this information. The positive relation between the physical characteristics and the level of participation is according to the theoretical framework not unexpected. According to the theory as formulated in the theoretical framework, citizens that live in high secured houses, commonly expensive houses, are more involved in sporting programs and other volunteering activities because the citizens have more financial and social possibilities to do so. The citizens within low value houses commonly don't have these possibilities. What this information means for the level of neighborhood safety will not be presented yet. This relation will be explained later on in this chapter. First we take a look at hypothesis 6.2, which test the relation between the social composition and the level of participation.

The social composition – the percentage of Dutch native citizens and the residential stability – plays, according to the theoretical framework also an important role with respect to the level of participation in a neighborhood. The assumption that neighborhoods with a high percentage of Dutch native citizens and a high residential stability have a high level of participation will be tested with the use of hypothesis 6.2 and different partial regression analyses. The results of these regression analyses are presented in table 11 in column M3. From this table it is clear that the direct relation between the distance and the level of participation is not significant anymore, because the value of the dwellings and the residential stability will play an important role. These two variables are the intervening variable through which the distance influences the level of participation indirectly. The percentage of the non-vacant dwellings and the percentage of the Dutch native citizens don't play a significant role.

If we take a look back at the theoretical framework in chapter 1, the relation between the residential stability and the level of participation is plausible because, as Michener (2013) argues, citizens that want to participate in (social) interventions within their neighborhood feel a greater sense of responsibility. This responsibility is the greatest if the citizens stay for a longer period within a neighborhood. That the percentage of Dutch native citizens doesn't play a role, is not according to the assumption of different theories, because, as presented in chapter 1, citizens are more willing to participate if they live together with other citizens that have the same ethnical background. Then citizens feel 'home' and they are more willing to keep that 'home' feeling and thus more willing to participate. Although not all relations are statistically significant, the distance, the physical characteristics and the social climate in a neighborhood is influenced for 46% by the variables distance, the physical characteristics and the social composition.

In the figure below the variables that influence the level of participation within a neighborhood in a significant manner are presented. In this figure, only the significant relations are presented and the non-significant relations are excluded in this model. This doesn't mean that these variables will be excluded in this whole thesis, because the variables can influence the level of neighborhood safety as we will discuss later on in this thesis. The most important aspect within the figure below is the relevance of the distance to the level of participation. There is no direct relation between those two variables, but there is a relation indirect via the value of the dwellings and the residential stability. This means that the distance is still important via the intervening variables. Between those intervening variables – the value of the dwellings and the residential stability – is no significant relation. This indicates that the value of the dwellings doesn't influence the residential stability in a neighborhood.



Figure 14: The significant relations between the distance, the physical characteristics, the social composition and the level of participation

In this section, the hypotheses 4.2, 5.2 and 6.2 are presented and tested with the use of the available statistical data. All hypotheses can be (partially) confirmed, because positive relations between the dependent and the independent variables are found. It is clear, if we take a look back to table 10 and table 11, that the distance still plays an important role in a direct or indirect way with respect to the social climate that exists of the level of social cohesion and the level of participation. The distance, the physical characteristics and the social composition within a neighborhood influence the social climate for 49% (social cohesion) and 46% (participation). Some variables are not significant in all hypotheses that are tested so far, but it is possible that these variables will be important with the explanation of the level of degradation or the level of neighborhood safety. Because the level of degradation is seen as an important predictor of neighborhood safety, this variable will be discussed at the end of this chapter.

5.4 The influence on cleanliness

As already mentioned in the theoretical chapter, the level of cleanliness is an important variable within the complex theory of neighborhood safety. The assumption is that the distance, the physical characteristics, the social composition and the social climate influence the level of degradation within a neighborhood. As noticed in the previous chapters, the level of degradation is re-defined in the level of cleanliness, so that positive relations indicate a confirmation of the hypotheses and a negative relation a rejection of the hypotheses. In this section, hypotheses 7 till 10 will be discussed and tested with the available statistical data. As in the previous sections, the relation with the distance to the city center will be discussed first. After the distance the physical characteristics will be included, followed by the social composition and the social climate. Off course, all relations will be presented in table 12, so it is clear if the relations with the level of cleanliness are positive or negative and the hypotheses should be confirmed or rejected.

According to the theoretical framework as discussed in the chapter 1, the distance will influence the level of cleanliness in the neighborhood with the general assumption that if the distance increases, the level of cleanliness will increase. Hypothesis 7 is based on this assumption and formulated as follows; *'if the distance increases, the level of cleanliness in the neighborhood will increase'.* In table 12 (M1) the standardized coefficients show that the relation between the distance and the level of cleanliness is positive and that this relation is significant. This indicates that the distance influence the level of cleanliness in a neighborhood. However, if we take a look to that adjusted R² it is clear that the distance influence the level of cleanliness only for 4%, which indicates that other intervening variables influence the level of cleanliness are positively related to each other if other variables are excluded. This is the result of the bivariate regression analyses. That intervening variables plays an important role by influencing the level of cleanliness is not a surprise if we take a look at the theoretical model in chapter 1. In this chapter the assumption is presented that the distance doesn't influence the level of cleanliness, but that this positive relation is caused by other variables, such as the value of the dwellings and the percentage of non-vacant dwellings in the neighborhood. To test this assumption, the hypothesis 8 is created in the following way; *'if the value of the dwellings and*

the percentage of non-vacant dwellings increase, the level of cleanliness will increase'. The partial regression coefficients are presented in table 12 (Column M2) which explains the relation between the distance, the physical characteristics and the level of cleanliness in the neighborhoods. In this table, it is clear the relation between the distance and the level of cleanliness is turned from positive to a negative relation. This indicates that the assumption that the positive relation in the first model (M1) is caused by other variables, is correct. In this case the positive relation between the distance and the level of cleanliness is caused by the variables of the physical characteristics in the neighborhood. If we take a look at the adjusted R² the level of cleanliness is influenced for 24% by the distance and the physical characteristics, although the influence of distance is not statistically significant. The value of dwellings and the percentage of the non-vacant dwelling are both significant related to the level of cleanliness.

If we take a look at the columns M1 and M2 in table 12, a reference can be made to the broken window theory of Kelling and Wilson (1982) who indicates a relation between the percentage of non-vacant dwellings and the level of cleanliness in the neighborhoods. The assumption of this theory is that non-vacant dwellings influence cleanliness in the neighborhood which influences the neighborhood safety. In the table, it is clear that the value of the dwellings and the level of the non-vacant dwellings influence the level of cleanliness in the neighborhood. If we keep the broken-window theory into mind, Wilson and Kelling (1982) argues that the social composition can influence the level of cleanliness by 'caring' for the neighborhood. If the neighborhood is 'cared' by the citizens, the neighborhood doesn't radiate a 'lack of care' and potential criminals will be deterred. The social compositions in this case are the residential stability and the percentage of Dutch native citizens in the neighborhood. If we include these two variables in the statistical model, hypothesis 9 will be tested which is formulated as follows; 'if the residential stability and the ethnical homogeneity increase, the level of cleanliness will increase'. In table 12 the relations between the distance, the physical characteristics and the social composition are presented in column M3. From this table, it is clear that the influence of the distance will decrease further if more variables are entered. Also the influence of the physical characteristics decreases, especially the value of the dwellings. The decrease of the influence of the value of the dwellings on the level of cleanliness can be caused by the insertion of the variables of the social composition. In particular the percentage of Dutch native citizens will influence the level of cleanliness in the neighborhood. In figure 15 all the significant relations are drawn, with respect to the influence on the level of cleanliness in a neighborhood. If we take all the entered variables into account an adjusted R^2 of 0.30 is found, which means that 30% of the cleanliness in a neighborhood can be explained by the distance, the physical indicators and the social composition within a neighborhood. The percentage of the Dutch native citizens and the residential stability both influence the level of cleanliness in a positive way, which assumes that if the ethnical homogeneity and the residential stability increase, the level of cleanliness will increase too. The hypothesis then can be confirmed.

Next to the different variables as discussed in the previous sections, the assumption is that the social climate will also influence the level of cleanliness. According to Van Stokkom and Toenders (2010) the presence of social cohesion can deter potential criminals of violent or criminal behavior that can lead to degradation. Furthermore, the assumption is that if the neighborhood doesn't have to deal with crime, graffiti and destruction, the level of cleanliness will rise, which encourage the level of participation because citizens need to 'care' for this cleanliness. So hypothesis 10 is formulated as follows; '*if the level of social cohesion and the level of participation increase then the level of cleanliness will increase'*. The hypothesis indicates a positive relation between the social cohesion, the level of participation and the level of cleanliness. To test this assumption, different partial regression analyses are conducted between these variables. The variables of the social climate – the social cohesion and the level of participation – are entered in the statistical model and presented in column M4 in the table below.

Table 12: Partial regression analyses between the distance, the physical characteristics, the social composition, the social climate and the level of cleanliness

		M1	M2	M3	M4	Exp.
Distance		0.20	-0.04	-0.08	-0.23	+
		0.00	0.73	0.46	0.03	
Physical characteristic 1	Value of dwellings		0.41	0.22	0.14	+
			0.00	0.08	0.25	
Physical characteristic 2	Non-vacant dwellings		0.26	0.23	0.20	+
			0.01	0.02	0.03	
Social composition 1	Dutch native citizens			0.29	0.09	+
				0.02	0.43	
Social composition 2	Residential stability			0.15	0.09	+
				0.16	0.47	
Social climate 1	Social cohesion				0.49	+
					0.00	
Social climate 2	Participation				0.02	+
					0.86	
R ²		0.04	0.26	0.34	0.46	
Adjusted R ²		0.03	0.24	0.30	0.41	

From the table above, it is clear that the positive influence of the distance is turned in a significant negative relation. This is plausible, because the insertion of the social cohesion caused a strong positive relation between the social climate and the level of cleanliness. The positive relation between the distance and the level of cleanliness in M1, as we discussed earlier, was caused by the intervening variables the percentage of the non-vacant dwellings and the level of social cohesion. The percentage of Dutch native citizens is not important anymore and also the level of participation doesn't influence the level of cleanliness in the neighborhood. The including of the social climate shows a high positive relation between the level of social cohesion and the level of cleanliness in the neighborhood. This highly positive relation is not surprising if we take a look at the broken window theory. This theory argues that the presence of social cohesion within a neighborhood, prevent crime, deviant behavior and neighborhood degradation. In other words, if the social cohesion increases, the level of cleanliness will increase too. This assumption is underwritten by the scientific literature and by the statistical results as presented in the table above. If we take a look at the adjusted R² in the table, a score of 0.41 is presented. This means that the level of cleanliness is influenced for 41% by the distance, the physical characteristics, the social composition and the social climate in a neighborhood. With the inclusion of the variables of the social climate, a last figure can be presented with respect to the level of cleanliness in the neighborhoods. In this figure, all significant relations are presented as shown in the table above. In this figure it is clear that the influence of the distance turns negative. This means that there is a positive relation through the intervening variables of the non-vacant dwellings and the level of the social cohesion. In the figure below, the significant relations are drawn, to make the different relations between variables visible. In this figure, it looks like the distance influences the level of cleanliness in a negative way if we test this relation in a bivariate manner. However, this negative relation can be explained by the highly positive relations via the variables of the social cohesion, the percentage of the Dutch native citizens, the percentage of the non-vacant dwelling and the value of the dwellings. These intervening variables together, create a negative relation between the distance and the level of cleanliness, while the relation between the distance and the cleanliness via the intervening variables is a positive relation.



Figure 15: Significant relation between the distance and cleanliness

In the previous sections, the hypotheses 7 till 10 are tested with the use of the available statistical material. As already mentioned earlier in this chapter, not all hypotheses can be confirmed. The distance influence the level of cleanliness in a negative way, and not in a positive way as expected from the theory. However, this negative relations can be explained by the intervening variables, as already mentioned before.

The value of the dwellings doesn't influence the level of cleanliness if other variables are entered in the model, but this variable is still important for some indirect relations. This is also the case for the percentage of the Dutch native citizens, that doesn't influence the level of cleanliness directly, but indirectly via the level of the social cohesion. The level of social cohesion and the percentage of non-vacant dwellings influence the level of cleanliness directly. Of course, these variables and the level of cleanliness will influence the objective safety in the neighborhoods according to the theory, but these relations will be discussed in the next sections.

5.5 The objective safety in neighborhoods

In the previous sections, different relations are discussed with respect to the social- and physical characteristics of neighborhoods. However, the main question of this thesis of course is the influence of these social- and physical characteristics on neighborhood safety. In the theoretical chapter a deviation is made between the objective safety of neighborhoods and the subjective safety. In this section, the influence of the social- and physical indicators will be discussed on the objective neighborhood safety, the so called 'evidence-based safety'. In the theoretical framework and in the previous section, the distance to the city center is the starting point of the analyses. Also with respect to neighborhood safety and the Chicago school theory, the starting point is the distance. The hypothesis (hypothesis 11) based on the assumption that the distance influence the objective safety, is formulated as follows; *'if the distance increases, the level of objective safety will increase'*. If we check this relation in table 13, column M1, a regression coefficient of 0.42 is found. This result is statistically significant, which means that the distance and the objective safety are related to each other when a bivariate analyses is conducted. This means that no other variables are included in the model. The adjusted R² of this model is 0.17, which means that the objective safety will be influenced for 17% by the distance. According to the theoretical framework, as discussed in chapter 1, this relation is plausible because zone 2 contains the most criminal activities and according the Chicago school theory, crime rates increase when the neighborhood is located close to the city center. However, according to this same

theory, the positive relation is not based on the distance itself, but on the physical characteristics of the different city zones. This indicates that the distance is only indirect related to the objective safety of the neighborhoods.

Hypothesis 12 is based on the assumed positive relation between the physical characteristics and the objective neighborhood safety; *'if the value of the dwellings and the percentage of non-vacant dwellings increases, the level of objective safety will increase'.* Especially the value of dwellings will play an important role according to different scientific research because high valued houses are more secured then social rental apartments so more burglars will choose to commit crime in a non-secured environment. In table 13, as presented on page 49, the column M2 represents the regression coefficients when the physical characteristics – the value of dwellings and the percentage of non-vacant dwellings (0.07) and the percentage of non-vacant dwellings (0.18). However, because both relations are not statistically significant, it is not correct to speak about causal relations between those variables. In this same table (column M2) it is clear that the relation of the distance decreases when the value of the dwellings and the percentage of non-vacant dwellings are entered in the model. But both of the physical characteristics don't influence the level of the objective safety in the five main cities in Overijssel, which means that the hypothesis cannot be confirmed. It is possible, however, that the objective safety will be influenced by other variables, such as the social composition.

According to the theory, as presented in chapter 1, it is plausible that the social composition of the neighborhood will influence the objective safety in neighborhoods. The residential stability will create a 'safer' environment because citizens 'know' who live in that particular neighborhood so they are more familiar to distinguish 'normal' from 'deviant' behavior. Hypothesis 13 is formulated to test the relation between the variables of the social composition and the objective neighborhood safety. The hypothesis if formulated as follows; 'if the residential stability and the percentage of the Dutch native citizen's increase, the level of objective neighborhood safety will increase'. This hypothesis assumes a positive relation between the residential stability and the percentage of Dutch native citizens and the objective neighborhood safety. If we take a look at the results of the partial regression analyses in column M3 in table 13, where the variables of the social composition of the neighborhoods are entered, we see that, surprisingly, the percentage of Dutch native citizens, is not significantly related to the level of objective safety. Although this is not according the hypothesis, there is a possible explanation for this outcome. According the theory of social mixing, homogeneity in neighborhoods will 'cause' criminal behavior according to Manly, Van Ham & Doherty (2011). Wilson (1991) refers to this statement with respect to ethnical minorities because they commonly have a low educational background and are commonly unemployed. The concentration of under-educated and unemployed citizens will lead to social isolation with deviant behavior as a result. However, because the negative relation that is found is not significant, there is no causal relation between these two variables, so more words about this relation are not needed in this thesis.

The residential stability, the other variable of the social composition, is positively related to the objective neighborhood safety as expected because, as already noticed in the previous section, the residential stability will create a 'safe' environment because citizens live in the neighborhood for a longer period en they recognize neighbors and deviant behavior. Especially the last part of the last sentence, the recognition of neighbors, indicates that the social climate in the neighborhood is also important with respect to the objective safety in neighborhoods. The column M3 in table 13 shows that the distance, the percentage of non-vacant dwellings and the residential stability are significant related to the level of objective safety. With an adjusted R^2 of 0.25, 25% of the objective safety is 'caused' by these variables.

Next to the social composition, the social climate can be important with respect to neighborhood objective safety. The social climate in this case exists of variables 'social cohesion' and 'participation' where the assumption is that both variables influence the neighborhood objective safety in a positive way. Hypothesis 14 that is formulated based on this assumption can be presented as; *'if the level of social cohesion and the level of participation increase, the level of objective safety will increase'.* The results of the regression analyses can be found in table 13, column M4. In this column the variables safety, the physical variables, the variables of the social composition and the variables of the social climate are entered. In this table it is clear that both variables are positively related to the objective safety in the neighborhoods, but both relations are not

significant. This makes it hard to conclude that the social climate will influence the level of objective safety in the neighborhoods. According to the theory, however, a positive relation between the social climate and the level of objective safety should be plausible, due to the presence of the social cohesion citizens are more willing to report crimes to the local police. But this same assumption can also explain the low positive relation and the low significance level. If there is a high level of social cohesion within the neighborhood, citizens are more willing to report crime, but also small incidents. This means that the number of objective safety can decline due to the willingness of citizens to report crimes and vandalism. This is the same case for the participation of citizens. If citizens want to participate, they are more willing to report crimes and small incidents to the local police. However, the adjusted R² of the distance, the physical characteristics and the social climate is 0.26, which indicate that the objective safety is influenced for 26% by these variables. Of course 74% is influenced by other variables, which commonly are individual characteristics, like age, drug-abuse, alcohol-abuse, physical diseases, etcetera. In the figure below the significant relations are presented based on column M4 from table 13. The only variable that significantly will influence the objective safety is the percentage of non-vacant dwellings. All other variables that were significant in the previous figure are not significant anymore. In this figure, it is clear that the residential stability, which was significant in the first place, is not significant related to the objective safety anymore. This indicates that the positive relation is based on intervening variables and not on a 'real' relation between the variables.



Figure 16: Relations between the distance and the objective safety

Next to the influence of physical characteristics, the social composition and the social climate, the level of cleanliness of the neighborhood will play an important role with respect to the objective neighborhood safety. According to the theoretical framework as discussed in chapter 1, the broken window theory assumes as positive relation between the level of cleanliness and the objective safety. The assumption is that if a neighborhood shows signs of degradation, potential perpetrators are more willing to commit crime, because the neighborhood shows 'lack of care' and a lack of social cohesion. Hypothesis 15 that is formulated based on the relation between the level of cleanliness and the level of objective safety can be presented on the following way 'if the level of cleanliness increases, the level of objective safety will increase'. To test this hypothesis a partial regression analyses is performed and the results are presented in table 13 below. In the table, the column M5 represents the influence of the earlier discussed variables and the level of cleanliness on the objective safety of neighborhoods. The influence of the level of cleanliness, however, has a regression coefficient of -0.02. This means that the relation is not statistically significant and that the level of cleanliness doesn't influence the objective safety in the neighborhoods. The hypothesis cannot be confirmed based on the information below, so the broken window theory is not present in the five main cities of Overijssel. However, all discussed variables influence the objective neighborhood safety with an adjusted R² of 0.25. This means that the objective safety in the neighborhoods will be influenced for 25% by the distance, the physical characteristics, the social composition, the social climate and the level of cleanliness. Of course, in the previous sections a figure was presented with all significant relations, but, as shown in the table below, there are no significant relations left with respect to the neighborhood safety. This means that the variables will not directly influence the level of objective safety in the neighborhoods, but that all variables that where significant before, influence the level of objective safety via other variables.

		M1	M2	M3	M4	M5	Exp.
Distance		0.42	0.37	0.26	0.21	0.21	+
		0.00	0.00	0.02	0.08	0.09	
Physical characteristic 1	Value of dwellings		0.07	0.09	0.01	0.02	+
			0.51	0.48	0.89	0.90	
Physical characteristic 2	Non-vacant dwellings		0.18	0.22	0.20	0.20	+
			0.08	0.03	0.05	0.06	
Social composition 1	Dutch native citizens			-0.11	-0.13	-0.13	+
				0.36	0.33	0.33	
Social composition 2	Residential stability			0.30	0.18	0.18	+
				0.01	0.18	0.19	
Social climate 1	Social cohesion				0.11	0.10	+
					0.43	0.51	
Social climate 2	Participation				0.20	0.20	+
					0.15	0.15	
Cleanliness						-0.02	+
						0.90	
R ²		0.18	0.22	0.30	0.32	0.32	
Adjusted R ²		0.17	0.19	0.25	0.26	0.25	

Table 13: Partial regression analyses between the social- and physical characteristics and the objective safety

In the table above, it is clear that the influence of distance decreases from 0.42 to 0.21 when other variables entered the model. Most of the hypotheses as presented in this section can be rejected if multiple variables are entered the model, which is not according to the expectations based on the theoretical framework. Although the objective safety of neighborhoods is an important issue within the complex theory of neighborhood safety, the subjective safety should not be forgotten. The assumption is that all discussed variables, and the objective safety as well, will influence the level of subjective neighborhood safety. The influence on the subjective safety in neighborhoods will be discussed in the next section.

5.6 The explanation of neighborhood subjective safety

In the previous section, the variables are discussed that influence the objective part of neighborhood safety. As Zimring (2012) noticed, the objective safety is not the only part of neighborhood safety that is important. The subjective element, the safety feelings of citizens, is important as well. In the previous sections, hypotheses 1 till 15 are discussed and tested. In this section, the last six hypotheses will be tested with respect to the subjective part of neighborhood safety. Of course in this section the influence on neighborhood subjective safety will start with the influence of the distance, which is the starting point of this thesis. The distance then will be followed by hypotheses that will test the influence of the physical characteristics, the social composition, the social climate, the level of cleanliness and the level of objective safety on the level of subjective safety. In this section the hypotheses will be presented by the use of a table that already includes all different variables. The table that presents the different outcomes of the partial regression analyses is table 14, which is shown below.

As already noticed, this section starts with the influence of the distance on the neighborhood subjective safety. Hypothesis 16 is based on the assumption that the distance influences the subjective safety and formulated as follows; *'if the distance increases, the level of subjective safety will increase'.* The assumption is that citizens that live near the city center feel less safe because more criminal activities are present, there is less social cohesion and more nuisance of drugs-abuse and wanderers. If we take a look in table 14, in column M1, the bivariate relation between the distance and the neighborhood subjective safety, but the adjusted R² is 0.09. This result shows that only 9% of the subjective neighborhood safety is influenced by the distance and that the other 91% is influenced by other variables. That other variables influence the neighborhood subjective safety more than the distance is also presented in the theoretical framework

which indicates that the value of the dwellings and the percentage of the non-vacant dwellings also influence the neighborhood subjective safety. Especially the percentage of the non-vacant dwellings should be important with respect to the broken window theory and the level of cleanliness in the neighborhood.

If we take a look at the physical characteristics in the neighborhood – the value of the dwellings and the percentage of non-vacant dwellings – that can influence the neighborhood subjective safety, the results are presented in table 14, column M2. The hypothesis that addresses and tests this relation is formulated in hypothesis 17; *'if the value of dwellings and the percentage of non-vacant dwellings increase, the level of subjective safety will increase'.* The results of this hypothesis are positive because both the value of the dwellings and the percentage of non-vacant dwellings is related with a percentage of non-vacant dwellings is related to the level of subjective safety in the neighborhoods. The value of the dwellings is related with a regression coefficient of 0.31. Together with the distance, the two physical characteristics influence the neighborhood subjective safety for 30%. This percentage is higher than the 9% influence of the variables distance alone. But it is not clear if the distance still influence the subjective safety. The distance influences the subjective safety also via the value of the dwellings. The percentage of the non-vacant dwellings however, is not influenced by the distance, but does influence the level subjective safety in a significant way.

Of course the assumption is created in the theoretical framework that the social composition influences the neighborhood subjective safety as well, because the residential stability will only increase if people feel safe in the neighborhood. The percentage of the Dutch native citizens – the other variable of the social composition- will also influence the subjective safety because if citizens live together with other citizens that have the same ethnical background, they feel more comfortable then that they live with other citizens with another ethnical background. For this reason, hypothesis 18 is created that can be presented as follows; *'if the residential stability and the ethnical homogeneity increase, the level of subjective safety will increase'*. If we test this hypothesis with different partial regression analyses the outcomes as presented in table 14, column M3, are found. In this table, the distance doesn't influence the subjective safety in a direct significant way anymore if we test this relation of the percentage of Dutch native citizens and the subjective safety is 0.35, which explains why the regression coefficients of the other variables decrease. If we combine all these variables into one regression analyses, an adjusted R² of 0.39 is found. This means that the subjective safety in the neighborhoods in the five main cities in Overijssel is influenced for 39% by the distance, the physical characteristics and the social composition of these neighborhoods. Although the distance doesn't influence of the distance is now via the percentage of Dutch native citizens and the social composition of these neighborhoods. Although the distance doesn't influence of the distance is now via the percentage of Dutch native citizens and the social composition of these neighborhoods. Although the distance doesn't influence the subjective safety directly, the influence of the distance is now via the percentage of Dutch native citizens and the social composition of these neighborhoods. Although the distance doesn'

For now, the percentage of non-vacant dwellings and the percentage of Dutch native citizens have the strongest influence on the subjective neighborhood safety, if no other variables are entered in the table and the figure. As already noticed in the theoretical framework in chapter 1, the social climate, the level of cleanliness and the objective safety will influence the neighborhood subjective safety as well. In terms of the social climate in a neighborhood, the following hypothesis (19) can be written; 'if the level of the social cohesion and the level of participation increase, the level of subjective safety will increase too'. In this case, the social climate exists of both the level of the social cohesion and the level of participation. According to the theoretical framework, the assumption is that if citizens have ties with the community and citizens are willing to participate in social- or sporting programs, they feel safe in their neighborhood because they can identify perpetrators and they can see criminal activities in an earlier stage. If we test this hypothesis with a partial regression analyses, the results as presented in column M4 in table 14 are found. In this column it is clear that the influence of distance is even more decreased and that this influence is not significant anymore. The social cohesion (0.29) and the level of participation (0.30) show a high positive relation with the neighborhood subjective safety which are also significant relations. The hypothesis as formulated above can thus be confirmed based on the statistical data. According to this theory, this outcome is not surprising because the social cohesion and the level of participation are commonly seen as the important indicators of the safety feelings of citizens. Especially the social cohesion is often a central factor within social research based on the subjective safety of neighborhoods. If we take a look at the adjusted R^2 of 0.48 the results of the regression analyses presents that the distance,

the physical characteristics, the social composition and the social climate influence the subjective neighborhood safety with 48%. This indicates that all significant variables are positively related to the neighborhood safety. The distance now influence the level of subjective safety via the variables Dutch native citizens, the level of social cohesion and the level of participation, as also can be seen in figure 17 below.

Another central point within the theory of subjective safety is the level of cleanliness in the neighborhoods. If a neighborhood shows lack of care and creates a criminal ambiance, then citizens don't feel safe in their own neighborhood (Breetzke & Pearson, 2014). However, if this assumption can be underwritten by statistical material and partial regression analyses will be tested with hypothesis 20 which test the relation between the level of cleanliness and the level of subjective safety. This hypothesis is formulated in the following way; *'if the level of cleanliness in a neighborhood increases, the level of subjective safety will increase'*. Although the assumption seems plausible, this hypothesis is not confirmed by the statistical results of the regression analyses. The level of cleanliness only influences the level of subjective safety with a correlation coefficient of 0.03 and in addition this relation is not statistically significant. The rejection of this hypothesis indicates that the relation between the level of cleanliness and the level of degradation in neighborhoods is different than the level of degradation in American cities on which the theory of Breetzke and Pearson (2014) is based. The overall influence of all variables as discussed in the previous sections decreased with 1% if the level of cleanliness in introduced to the model.

Next to the level of cleanliness, the general assumption within the complex theory of neighborhood safety is the relation between the objective neighborhood safety and the subjective neighborhood safety. The assumption is that these two aspects of neighborhood safety are positively related to each other, because according to the theoretical framework, if a neighborhood has to deal with a lot of crime and vandalism it is likely that citizens don't feel safe in this environment. Or in other words, if the objective safety is high, the assumption is that the subjective safety will also be high. To test this relation, the last hypothesis (hypothesis 21) of this thesis is formulated as follows; 'if the level of objective safety increases, the level of subjective safety will increase'. In the table below, in column M6, the relation is presented between all the variables that can influence the subjective safety in the neighborhoods. With respect to the level of objective safety, the influence on the level of subjective safety is indicated with a regression coefficient of 0.20. This indicates a positive relation between these two variables as the hypothesis already suggest. In the same column it is clear that the distance, the value of the dwellings, the residential stability and the level of cleanliness doesn't influence the subjective neighborhood safety in a statistical significant way. However, if we insert all variables an adjusted R^2 of 0.50 is found. This means that 50% of the subjective safety in the neighborhoods is influenced by the distance, the physical characteristics, the social composition, the social climate, the level of cleanliness and the level of objective safety. If we then want to see what characteristics influence the level of subjective safety, we can answer this question with the following variables; the percentage of non-vacant dwellings, the ethnical homogeneity, the social cohesion, the level of participation and the level of objective safety. For the complete overviews, the figure below shows the significant relations with respect to the level of the subjective safety in a neighborhood, between all variables that are discussed in this chapter. As we can see in this figure, the distance doesn't influence the subjective safety directly, but only indirectly via other variables. The percentage of non-vacant dwellings influences the level of subjective safety in a direct way, but also indirectly via the objective safety level in the neighborhood.



Figure 17: Significant relations with respect to subjective safety

		M1	M2	М3	M4	M5	M6	Exp.
Distance		0.31	0.21	0.17	0.05	0.06	0.02	+
		0.00	0.04	0.10	0.60	0.56	0.86	
Physical characteristic 1	Value of dwellings		0.28	0.05	-0.07	-0.08	-0.08	+
			0.01	0.67	0.50	0.48	0.45	
Physical characteristic 2	Non-vacant dwellings		0.31	0.28	0.25	0.25	0.21	+
			0.00	0.00	0.00	0.01	0.02	
Social composition 1	Dutch native citizens			0.35	0.27	0.26	0.29	+
				0.00	0.02	0.02	0.01	
Social composition 2	Residential stability			0.15	-0.04	-0.04	0.08	+
				0.12	0.71	0.68	0.47	
Social climate 1	Social cohesion				0.29	0.27	0.25	+
					0.02	0.04	0.05	
Social climate 2	Participation				0.30	0.30	0.26	+
					0.01	0.01	0.03	
Cleanliness						0.04	0.03	+
						0.75	0.76	
Objective Safety							0.20	+
							0.04	
R ²		0.10	0.32	0.43	0.52	0.52	0.55	
Adjusted R ²		0.09	0.30	0.39	0.48	0.47	0.50	

In the table above, the hypothesis 16 to 21 are presented and tested based on the statistical information. There could be several reasons why a hypothesis can be confirmed in the five main cities in Overijssel or that an assumption is not present, but all these reasons will be clarified in the next chapter, the conclusion of this thesis. Of course this thesis started with a central research question, and this question and the sub-questions will be answered in the conclusion with respect to the

neighborhood safety in the five main cities in Overijssel. Furthermore recommendations will be presented how municipalities can increase the neighborhood objective and subjective safety. For now it is clear that different variables can influence other variables but also the level of neighborhood safety and that both the objective and the subjective safety are influence by different variables. This shows how complex theories of neighborhood safety are and how many variables and relations between those variables are involved to explain the differences on safety level between different neighborhoods.

6. Conclusion

In the previous chapters, the results of the different regression analyses are discussed with respect to the objective and the subjective safety of the neighborhoods in the five main cities in Overijssel. The regression analyses are based on twenty-one hypotheses that are formulated with the use of different scientific literature. The Chicago school theory is seen as starting point of many theories and this thesis. The Chicago school theory is complemented with other theories related to neighborhood safety and tested with the available data from the 'Wijkscans', the 'Veiligheidsmonitor' and other relevant statistical material from the 87 neighborhoods of the five main cities in Overijssel. In this chapter, the research question and the different sub questions will be answered and the main conclusions with respect to the twenty-one hypotheses will be listed.

In the introduction chapter of this thesis the main question is posted in which way different social and physical characteristics can influence the level of neighborhood safety. The main goal of the results is to recommend interventions that can sustain or increase neighborhood safety in Neighborhoods in Overijssel. The research question is formulated on the following manner; 'Which social and physical factors influence neighborhood safety in 2012 in the main cities in Overijssel and what kind of interventions can be recommended to sustain or increase neighborhood safety?' To answer this question, three sub-questions are developed which will be discussed below. After the sub-questions are answered, an overall conclusion will be drawn with respect to the main question as presented above.

6.1 Sub-question one

The first sub-question of this thesis is developed to give an overview of the level of objective- and subjective safety in the five main cities in Overijssel. The sub-question is formulated as follows: 'What is the level of objective safety and the subjective safety in the neighborhoods in the main cities in Overijssel?' Based on the table as presented on page 31 it is clear that the municipalities Deventer and Hengelo have the lowest score on the level of objective safety. This means that the most criminal activities take place in these municipalities. The municipality of Zwolle scores the highest on the scale, which indicates that in the municipality of Zwolle, the least criminal activities take place. Although the assumption that the cities Deventer and Hengelo are the least safe could be correct, there can be other reasons for the score on the objective safety ladder. Because the level of safety is based on police-reports, the level of objective safety is measured based on the willingness of citizens to report crimes, the willingness to detect crime of the local police and the interpretation of criminal activities. The objectives safety thus has a high 'dark number' so it is very difficult to say which cities or neighborhoods are objective safe or not safe. This dark number is also the same for the level of nuisance, which is more present in Enschede then in the other cities. The number of nuisance also depends on the willingness to report nuisance to the local police and on the interpretation of antisocial behavior.

Of course neighborhood safety doesn't exist of objective safety only, but also on subjective safety. The subjective safety is measured in the 'wijkscans' and the 'veiligheidscans' with the question 'do you feel safe in your neighborhood?' Most citizens that feel safe in their neighborhood live in Hengelo, which means that this city is the safest according to the residents. This is remarkable, because, as presented before, Hengelo have to deal with a low score on the objective safety ladder, which indicates that more criminal activities (which are also reported to the police) take place in Hengelo compared with the other cities. This indicates that objective and subjective safety are important for the safety levels in the neighborhood, but that those two components of safety are not necessarily related to each other. To give an answer on the sub-question, it is hard to give a clear answer based on the safety level of all municipalities. Every neighborhood has its own level of safety, which makes it hard to compare the different neighborhoods in different cities. Of course, on page 32 the level of objective safety, the level of nuisance and the level of subjective safety are presented per city and per neighborhood, but it is not possible to give a clear answer on the first sub-question that is formulated above.

6.2 Sub-question two

The second sub-question, with respect to the research question, is the question which physical and social characteristics influence the neighborhood safety. Of course there are many characteristics that can influence neighborhood safety, but not all these characteristics will be physical of social. The sub-question; *'Which physical and social characteristics influence the objective and subjective safety in the neighborhoods in the main cities in Overijssel?'* will be answered in this section.

If we go back to the previous chapter, the different tables show that different characteristics within neighborhoods are related to each other. These characteristics can be divided into physical and social characteristics, where the distance can be seen as the starting point of all these relations. In the table below, all variables that are used in this thesis are listed, divided into physical and social characteristics. The level of cleanliness is neither presented in the column of the physical characteristics or the social characteristics because the level of cleanliness is a subjective perception of citizens based on objective signs of degradation in the neighborhoods. This means that the level of cleanliness is scored based on the opinion of the citizens of that neighborhood. The general assumption in this thesis is that the physical characteristics of the neighborhoods influence the level of safety via the level of cleanliness and via the social characteristics.

Table 15: Physical and social characteristics

Physical characteristics		Social characteristics
Distance	Level of cleanliness	Percentage of Dutch citizens
Value of dwellings		Residential stability
Percentage of non-vacant dwellings		Social Cohesion
		Participation

The relations between all these characteristics and the level of neighborhood safety are formulated within 21 hypotheses. As already discussed in chapter 5 and based on the different partial regression analyses, some hypotheses can be confirmed, but others should be rejected. Because the question is about neighborhood safety, one can make a distinction between the objective safety and the subjective safety in the neighborhoods where both components of safety are influenced by other variables. The objective safety is mostly influenced by the distance and the percentage of the non-vacant dwellings in a direct way, while there is no relation between the social characteristics and the level of cleanliness. However, when all variables are included in the partial regression analyses, then significant relations are absent. This means that the positive and significant relations. The adjusted R² of all variables with respect to the objective neighborhood safety is 0.25, which means that 25% of the objective safety will be influenced by the physical characteristics, the level of cleanliness and the social characteristics and that the other 75% will be influenced by other variables.

As formulated above, the percentage of the Dutch native citizens and the level of cleanliness don't influence the objective safety in neighborhoods, while this where important hypotheses based on the theoretical framework. The main reason for this is because the American theories and the Dutch society differ from each other. With respect to the percentage of Dutch native citizens and the level of cleanliness, two important reasons are presented why these hypotheses cannot be confirmed;

1- The level of cleanliness, as discussed in the broken-window theory, should be related to the objective safety in neighborhoods according to the theoretical framework. However, this relation is not found in the statistical results. One explanation for this is that the level of degradation in the Dutch neighborhoods will never be the same as the level of degradation in American neighborhoods on which the theory is based. In the Netherlands, neighborhoods will not be renovated if the degradation will become too bad. In the American cities, neighborhoods will not be renovated untilled private investors will invest in a neighborhood. So in the Netherlands, interventions will take place much earlier than in American cities, which influence the applicability of the broken window theory on Dutch cities. Furthermore, there are differences in the way the level of cleanliness is measured. In this thesis, the level of cleanliness is measured based on the perceptions of the citizens that live in the neighborhoods. In the American

theories, the level of cleanliness is measured based on the opinion of the policy makers within that city or within that neighborhood.

- 2- The broken-window theory is, according to the theory important with respect to the positive relation between the level of cleanliness and the level of objective safety. Although this relation is absent within the results of the partial regression analyses, there are some indicators that the broken-window theory can still be present within the neighborhoods of the five main cities in Overijssel. The percentage of the non-vacant dwellings, which is positively related to the level of objective safety, can be seen as an objective indication for the level of cleanliness. So although the level of cleanliness, which is a perception of the citizens, is not related to the level of objective safety, the percentage of the non-vacant dwellings is still important with respect to the broken-window theory.
- 3- Furthermore, some assumed relations between different variables can be absent or different due to policy interventions some neighborhoods already sustained. Because it is not clear whether a neighborhood already developed policy interventions, it is hard to see the differences between two or more neighborhoods. In this case, it is possible that some municipalities already increased some aspects of the neighborhood safety, while other neighborhoods haven't. This can influence the statistical relations as shown in this thesis.

The subjective part of neighborhood safety is influenced by the percentage of the non-vacant dwellings, the percentage of the Dutch native citizens, the level of social cohesion, the level of participation and the level of objective safety. All these variables are significantly related to the level of subjective safety in the neighborhoods. If we include all variables, the subjective safety is influenced by these variables for 50%. The other 50% can be influenced by individual characteristics that are not included in this research. If we take a closer look at the subjective safety, the distance itself, which was the starting point of this research, doesn't influence the subjective safety directly. However, if we only take the bivariate relation, then the distance influence the level of subjective safety. This relation decreased when more variables are entered in the partial regression analyses, because the assumed direct relation will become indirect via the other variables that are the intervening variables. The level of cleanliness however, which is seen as an important indicator of neighborhood safety, doesn't influence the subjective safety in a significant way. This is surprising, because the assumption is that if the neighborhood is 'clean' citizens feel more safe than when the neighborhoods shows signs of degradation. In the American neighborhoods, as already noticed before, the level of degradation can be higher than the level of degradation in the Netherlands. So it is possible that the level of cleanliness doesn't play an important role within Dutch cities compared with the American neighborhoods on which the theory of the Broken Windows is based. Dutch citizens in that case are 'used' to the interventions the local government takes when a neighborhood shows signs of degradation. Furthermore, it is possible that current policies decrease the distribution of the perceptions citizens have about the level of cleanliness. This effect can also influence the statistical analyses that are performed in this thesis.

To answer this research question, it is clear that the objective safety and the subjective safety both are influenced by other variables. In the case of the objective safety, there are no significant relations found when all variables are included. If we conduct several bivariate analyses, then several significant relations are found. This means that all variables together influence the neighborhood safety, but not always in a significant way. Because some relations are not significant, it is possible that individual characteristics play an important role. The subjective safety however, is mostly influenced by the social characteristics of the neighborhoods and the percentage of non-vacant dwellings. So both aspects of neighborhood safety are influenced by other (and different) variables. There are, however, two similarities;

- 1- Both components of safety the objective safety and the subjective safety are influenced by the distance. In the objective safety this relation is direct while the subjective safety is influenced by the distance in an indirect way via the intervening variables.
- 2- In both components of safety the percentage of the non-vacant dwellings play an important role. This variable is also amendable to change for policy makers, so we will discuss this variable further on in this thesis in a more specific way.

6.3 **Sub-question three**

As already discussed in the previous sections, it is clear that the level of objective safety and the level of subjective safety are influence by other variables, except the distance and the percentage of non-vacant dwellings. This means that for both of the safety aspect other interventions are recommended. The third research question is about the recommendation of different interventions; *'Which recommendations can be made to local and provincial government to develop interventions on neighborhood level to sustain or increase neighborhood safety?'* Of course it is only possible to recommend interventions based on the statistical material and not on experimental research. Furthermore it is not clear whether some municipalities already conduct policy interventions to increase or sustain neighborhood safety. In this section, we will discuss interventions for both the objective and the subjective safety, starting with the recommendations for the objective safety.

The objective safety in the different neighborhoods is hard to influence, because there are no significant relations found in the partial regression analyses if all variables are include. However, if go back to the starting point of the model, we see that the residential stability and the level of non-vacant dwellings play a role if no other variables are included. Also the relation with the distance is significant in an earlier stage, but this variable is not amendable to change, so it is not possible to create interventions around the variable distance. The residential stability is also hard to change, because it is not possible to 'force' citizens to stay in their neighborhood for a couple of years. However, it is possible to make the neighborhood attractive for all citizens so that citizens can move to a 'better' house without moving to another neighborhood. Furthermore, the percentage of the non-vacant dwellings is an important variable if we conduct bivariate analyses. For municipalities it can be attractive to reach a higher level of non-vacant dwellings. This variable will influence both the level of objective safety and the level of subjective safety, which makes it an important variable for the policy makers. It is important for the policy makers to get a 'view' about the percentage of non-vacant dwellings that are present in the neighborhoods and to develop intervention that increase this percentage. There are several examples of policy interventions that increase the percentage of the non-vacant dwellings are several examples of policy interventions that increase the percentage is not non-vacant dwellings.

Although it is hard to influence the level of objective safety, it is possible to influence the level of subjective safety. The subjective safety is only based on safety feelings, but it is seen as an important issue of the complex theory of safety. If citizens don't feel safe in their neighborhood, they will move to another neighborhood, which of course decrease the residential stability. But subjective safety is also important for the safety reports of the police, because citizens that feel safe will report crime to the police earlier then citizen that don't feel safe. As already discussed before, the subjective safety is mostly influenced by the social characteristics and the percentage of the non-vacant dwellings. If we take a closer look at the variables that influence the subjective safety, the variables that are amendable to change for policy makers are the level of participation, the level of social cohesion (the variables of the social climate) and the percentage of the non-vacant dwellings. Furthermore, the percentage of Dutch native citizens plays an important role. For all variables, interventions will be recommended and discussed in the following sections.

6.3.1 The percentage of non-vacant dwellings

As discussed earlier in this thesis, the percentage of the non-vacant dwellings plays an important role with respect to both the objective and the subjective safety in the neighborhoods. The percentage of the non-vacant dwellings is amendable to change, and that makes this variable important for the policy makers. If the percentage of the non-vacant dwellings increase, the citizens feels more safe within their neighborhood. This because a high percentage of vacant dwellings shows a lack of 'care' which can be seen as an invitation for deviant behavior. Citizens then feel not safe and they don't want to stay in their neighborhood, which increase the percentage of the vacant dwelling further. This indicates that a vicious circle will be created with negative effects for the level of subjective safety. Policy makers should create interventions that increase the percentage of non-vacant dwellings by creating student houses from vacant dwellings, or make houses more attractive for new citizens.

6.3.2 The social climate

As discussed in the theoretical framework, the social cohesion and the level of participation do influence the level of subjective safety in the neighborhoods. The main focus of the interventions that need to increase or sustain the level of subjective safety in the neighborhoods should be on the social climate. This means that the social cohesion must be increased by creating 'working programs' between neighbors or by organizing different activities. Furthermore local participation needs to be stimulated. Not only in sporting programs, but also in programs with local initiatives, or social intervention programs such as cleaning or painting kids play grounds. Of course a lot of interventions can be developed, but the most important thing is to make the neighborhood livable and stimulate contacts between neighbors, the local government and the local police.

6.3.3 The percentage of Dutch native citizens

For the percentage of the Dutch native citizens, it is clear that a concentration of Dutch native citizens or the concentration of non-Western citizens can have negative consequences with respect to neighborhood safety. One of the most important theories is the theory of social mixing (Manley, Van Ham & Doherty, 2011). According to this theory Non-Western immigrants will be attracted by the presence of social rental apartment, that are more present in zone 2 than in other city zones. The theory of social mixing is used as a strategy from policy makers to tackle assumed negative neighborhood effects based on the ethnical homogeneity of neighborhoods. The idea is that mixing non-Western immigrants with Dutch citizens lead to a growth in neighborhood (subjective) safety. Wilson (1987; 1991) suggest that concentrations of individuals experiencing long term unemployment in certain neighborhoods can lead to different outcomes, such as crime, deprivation and feelings of unsafety. Long-term unemployed citizens are often under educated and not able to understand how to get a job and how to operate and behave in the society. The concentration of low socio-economic residents, which can be seen as an effect of homogeneity neighborhoods, can lead to social isolation (Zimring, 2012; Manley, Van Ham & Doherty, 2011).

The ideal model of the mixed community is that the development of role models and the discouragement of unsafety feelings will lead to a 'better' and 'safer' community. The desire of policymakers to create mixed communities and neighborhoods is based on the expectation that mixed neighborhoods provide opportunities for a housing career in the district, that there is more social contact and that there is more informal social control and social cohesion. If non-Western immigrants stay together, they won't learn the Dutch language and the Dutch culture, and they are not able to 'make friends' with other cultures. Furthermore, if Dutch native citizens and the Non-Western immigrants will live in the same neighborhoods, the cultural background of citizens don't play a role anymore with respect the subjective safety of neighborhoods, because all neighborhoods will house the same amount of non-Western citizens. Of course this theory is a theory based on an ideal image, but in small steps it is not unthinkable that the social mixing theory will have a positive effect on the neighborhood safety.

6.4 Main conclusion

As already mentioned before, the main question that is formulated in this thesis is; 'which social and physical factors influence neighborhood safety in 2012 in the main cities in Overijssel and what kind of interventions can be recommended to sustain or increase neighborhood safety?' As presented in the theoretical chapter, the theory of neighborhood safety is very complex and dynamic. Both the objective safety and the subjective safety are influence by other variables. The objective safety is influenced by the distance and the percentage of the non-vacant dwellings in a direct way, while there is no relation with the social characteristics and the level of cleanliness. Later on, when all variables are included in the regression model, no significant relations are found which is also presented in section 6.2. The subjective safety however, is influenced by the percentage of non-vacant dwellings, the percentage of Dutch native citizens, the level of social cohesion, the level of participation and the level of objective safety. The characteristics that influence both components of neighborhood safety are the distance (direct and indirect) and the percentage of non-vacant dwellings. Especially the last characteristic – the percentage of non-vacant dwellings – are amendable to change for policy makers which means that this characteristics is important for the development of (social) interventions. This conclusion in short can be seen as the main answer on the

research question in this thesis. The detailed answers can be found in section 6.1 till section 6.3. To avoid repeating what is already mentioned, a general answer on the research question suffices in this section.

In the previous sections answers are given on the research question and the different sub-questions as presented at the beginning of this thesis. With the answering of these questions with the use of different theories, the available data and the results of the partial regression analyses, some discussion points and recommendations for further research can be noticed. These discussion points and recommendations will be discussed in the next chapter.

7. Discussion & Recommendations

In the previous chapter, the conclusions of this thesis are drawn with respect to the 21 hypotheses that are formulated based on the theoretical framework. Based on these conclusions and based on the research itself, some discussion points have emerged that will discuss the theory and the partial regression analyses. Furthermore some recommendations can be made with respect to further research based on the complex theory of neighborhood safety. In this chapter, the discussion points and recommendations will be presented.

7.1 Discussion

In this thesis, a lot of different theories are used to present the complex theory of neighborhood safety. Most of these theories are developed in American cities and not in Dutch cities. Although the threat to the validity and the reliability are taken into mind, there are some differences between the American cities and the Dutch cities. To see whether the American literature is applicable to the Dutch cities, also Dutch literature and theories are used. But because some theories are never tested in Dutch cities, it is hard to use the Dutch literature in this thesis. Unfortunately not all hypotheses can be confirmed that are formulated based on the theories and a causation of this can be the differences between the American and the Dutch neighborhoods. It is possible that some American theories are based on variables that are measured in different ways then in the Dutch theories that causes the rejection of some hypotheses. Further research can confirm or disprove this assumption.

Furthermore one must take into mind that the neighborhoods in Overijssel have different characteristics than in other parts of the Netherlands. For example; the neighborhoods in Overijssel have less social rental apartments then in Noord-Holland and the neighborhoods in Overijssel have less non-Western immigrants than the neighborhoods in the western part of the Netherlands. In other words, there is less variance within the independent variables. However, because data is used only from neighborhoods in Overijssel, the threats to the reliability and the validity are very low at this part. But of course, it is hard to generalize the results to other provinces in the Netherlands that have different characteristics.

The conclusions that are drawn in this thesis are important for the province of Overijssel. The level of safety in the five main cities in Overijssel is presented, but also the variables that will influence neighborhood safety are made clear. However, as already noticed, it is possible that these conclusions will be different if data is used from other provinces. But of course, because this thesis focuses on the neighborhoods in Overijssel, the conclusions can be very valuable for this province because the most important safety issues are presented in a clear way with the use of tables and figures. The results of this thesis can help the local government to create interventions that are based on variables that actually influence the level of safety in the neighborhoods. Furthermore, these results show which variables influence neighborhood safety in a direct and indirect way, but also which variables are amendable to change. For research, this thesis can be important because several (American) theories are tested within 87 neighborhoods in the province of Overijssel. It is now clear whether these theories can be (partially) confirmed or whether these theories are not applicable to Dutch neighborhoods at all.

The discussion points of this thesis, as presented above, show in which way the results are applicable to other provinces or other cities than de five main cities in Overijssel. Next to the discussion points, some recommendations can be made to policy makers and researchers. The several recommendations that will be presented in the next section can give valuable input for policy makers or for researchers that are interested in the complex theory of neighborhood safety and the different variables that influence neighborhood safety.

7.2 Recommendations

Based on the results of this thesis, multiple recommendations can be presented for researchers and further research. The first important point is the theory of the Chicago school. In this thesis, the distance from the neighborhood to the city center is measured and used as one variable. However, some neighborhoods also have their own commercial center. So it is possible that within the neighborhood other zones around this center can be developed or that surrounding neighborhoods

are influenced by the small commercial center of other neighborhoods. This means that research should not only be conducted on neighborhood level, but also on a smaller level, such as street level or housing blocks levels. If this research will be conducted, then it is possible that some variables will change. On smaller level, it is more likely to inserts variables that are measured on individual level. Further research with respect to smaller levels can be very interesting for the research based on safety levels or for policy makers.

In this thesis, the only physical variables that are used are the distance, the value of the dwellings, the percentage of nonvacant dwellings and the level of cleanliness. However, it is possible that other physical characteristics, such as street lights, street design or the spatial planning can have an important influence on both the objective and the subjective safety. In this research, it is possible that the CPTED theory plays an important role with respect to the relation between the physical characteristics and the level of neighborhood safety. To insert the CPTED theory, more data should be collected, not only on neighborhood level but also on individual level. Also this point can be very interesting to investigate further if more data is available.

With respect to the percentage of the Dutch native citizens, it is recommended to divide the non-Western immigrants in subgroups to see whether the percentage of Dutch native citizens influence the neighborhood safety. Some cultures are more integrated in the Dutch culture than other cultures, which can influence some conclusions that are drawn in this thesis. To check if there are differences within different cultures, further research and more data is needed.

In this chapter, several discussion points and recommendations are presented. Of course, it is not possible to conduct all those points for further research because not all data is available. This thesis started with the presentation of different theories of neighborhood safety that led to the presentation of 21 hypotheses that are tested with the use of different partial regression analyses. The conclusion gave an answer on the research question that was formulated in the previous chapter and this chapter will end this research with the presentation of discussion points and recommendations. I hope this thesis will give important input for further research and for policy makers. I hope that you, as a reader, liked my research and the presentation of the results.

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Databases:

Wijkscans of the different municipalities Veiligheidsmonitor of the different municipalities CBS Statline Map24 (maps24 Europe)

Attachment 1: Maps of the municipalities



Indeling wijken in Enschede 01-City 02- Lasonder, 't Zeggelt, Boddenkamp 03-Laares 04- De Bothoven 05- Hogeland Noord 06- 't Getfert 07- Horstlanden, Veldkamp, Getfert West 08- Tubantia 09- Roombeek, Roomveldje 10- Twekkelerveld 11- Bolhaar 12- Mekkelholt, Deppenbroek 13- Business en Science (UT) 14- Velve-Lindenhof 15- Wooldrik, Hogeland-Zuid 16- Schreurserve, Ribbelt 17- Stokhorst 18- Glanerbrug 19- Eekmaat 20- Cromhoffsbleek, Kotman 21- Boswinkel 22- Pahmos 23- Stadsveld 24-'t Zwering 25- Stroinkslanden Noord 26- Stroinkslanden Zuid 27- Wesselerbrink Noord-Oost 28- Wesselerbrink Zuid-Oost 29- Wesselerbrink Zuid-West 30- Helmerhoek



Indeling wijken Almelo 01- Aadorp 02- Noorderkwartier 03- Schelfhorst 04- Sluitersveld 05- Hofkamp 06- Binnenstad 07- Wierdense hoek 08- Nieuwstraat kwartier 09- Ossenkopperlerhoek 10- Windmolenbroek 11- De Riet 12- Bornerbroek

> Indeling wijken Hengelo 01- Binnenstad 02- Hengelose Es 03- Noord 04- Hasseler Es 05- Groot Driene 06- Berflo Es 07- Wilderinkshoek 08- Woolde 09- Slangenbeek 10- Buitengebied Hengelo



Indeling wijken Zwolle 01- Binnenstad 02- Kamperpoort 03- Veerallee 04- Dieze Oost 05- Dieze West 06- Indische buurt 07- Assendorp en Hanzeland 08- Schelle 09- Oldeneel 10- Ittersum 11-Geren 12- Buitengebied Zuid 13- Holtenbroek 14- Wipstrik 15- Buitengebied Noord 16- Buitengebied Oost 17- Stadshagen 18- Aa-landen 19- Westenholte 20- Berkum





Attachment 2: Measurement of objective safety

In this thesis, the level of objective safety and the level of nuisance are measured with the use of different police report. In this attachment, an overview is given of the criminal activities and nuisance behaviors that are taken into account in this thesis are presented.

Crime activities	Nuisance activities
Burglary	Drug nuisance
Car burglary	Alcohol nuisance
Car theft (also trucks)	Nuisance of audio/voice/hospitality
Motor/scooter theft	Weapon nuisance
Bike theft	Traffic nuisance
Burglary in companies	Nuisance of persons/crazy persons/insane persons
Burglary in school buildings	Noise from neighbors
Burglary in sports buildings	Environment nuisance
Burglary in garage/gazebo	Dog shit/garbage
Pick pocketing	Youth nuisance
Other property crimes	
Sexual assault	
Rape	
Incest/fornication/desecration	
Violence against persons	
Threat against persons	
Maltreatment	
Mugging	
Raid	
Impair on public order	
Destruction cars/houses/other properties	
Other material damage	
Drug trafficking	
Fraud	
Offenses against environment	
Possession of weapons	