KATHOLIEKE UNIVERSITEIT LEUVEN

FACULTEIT SOCIALE WETENSCHAPPEN

Social Capital and Well-Being in Belgium (Flanders)

Identifying the role of networks and context

Promotor: Prof. Dr. M. Hooghe
Onderzoekseenheid: Centrum voor Politicologie [CePO]

Proefschrift tot het verkrijgen
van de graad van:
Doctor in de Sociale Wetenschappen
aangeboden door
Bram Vanhoutte

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Chapter 1

Social Capital, Social Networks and Context: Theoretical Framework

1.1 Introduction

"L'enfer, c'est les autres." This quotation from Sartre's 'Huit Clos' is generally interpreted as a depreciation of human relations. What he really meant was that insufficient or poisoned human relations are at the base of a hellish experience of oneself, and of the world (Sartre, 2010). Instead of focusing on the individual, Sartre wanted to underline the importance of the other for our own happiness. In how far we rely on others for well-being is also the central theme of this dissertation. Individuals are embedded in social relations, and live in a certain context. In its turn, this context is also not self-contained, but has multiple relations with its environment. This interdependence of different levels of context and individual self can be seen as the basic principle guiding analysis in this dissertation. I focus on investigating the influence of structural and environmental determinants of well-being, since I want to counterbalance the importance attached to individual choices, values and responsibilities in a significant part of the well-being research. Investigating the prevalence and strength of social facts, not determined by individual level explanations, undermines the basic premises of the ontological individualism present in contemporary scientific approaches to well-being (Epstein, 2009). Instead of focusing on one aspect of well-being, and looking at it from different perspectives, I focus on the influence of context and social relations on a number of aspects of well-being.

The goal of this research project is to investigate to what extent social relations, and the larger context in the form of the community one lives in, influence one another, and have an effect on well-being. In this first chapter the theoretical background of the research project is treated more in detail, and specific attention is given to the mechanisms behind associations between well-being outcomes, social relations, and context. A summary of the theoretical choices is provided. Since the utility and adequateness of theory can only be judged properly when considering the research questions, these are outlined in relation to the theories presented.

1.2 Theoretical framework

To build a theoretical foundation in line with the research topic, I rely on three interrelated conceptual frameworks, namely social capital, social networks and social integration. In the following paragraphs, each concept will be defined, and its theoretical bases and research outcomes are reviewed. Diverging points of view over the content of each concept are outlined, and a position in the light of this dissertation is chosen and defended by theoretical arguments. In the final section I review the theoretical background of the concept well-being, and connect it with the research choices made.

1.2.1 Social capital

The concept of social capital, roughly translated as the idea that social relations are resources, has a long tradition. It can be traced back to the early days of social science, in Durkheim's emphasis on social integration or Marx's capital concept (Portes, 1998). Nonetheless, like 'class', 'gender' or 'race', it has increasingly become a contested concept, meaning that although there is a consensus on the broad nature of the phenomenon and its great importance, there is no agreed closure in terms of definition (Szreter & Woolcock, 2003). Therefore it is essential to delineate how social capital is seen in this work, in the light of the existing theoretical demarcations of the term. By examining different theoretical stances on aspects of social capital, the definition used is to be made explicit.

An important controversy is the level of analysis adequate to conceptualize social capital. It was first used, in a more metaphorical sense, as the "goodwill, fellowship, mutual sympathy and social intercourse among a group of individuals and families who make up a social unit" (Hanifan, 1913, p.130) and later in a similar vein by Jacobs (1961, p.148), who saw neighborhood networks as a city's irreplaceable social capital. These first uses of social capital, without using a definition, clearly position it as a collective, and even public, good, strongly linked to the presence of dense social relations in a community. One of the contemporary fathers of the social capital concept, Bourdieu (1986) saw social capital not as a collective good, but rather as reflecting an individual property, a person's personal connections, something of a private asset. This duality of social capital has led to the

development of two approaches, which are rarely combined, but not necessarily incompatible (Stolle & Hooghe, 2003).

1.2.1.1 Social capital as a public good

The first approach, dominant in political science, tends to use social capital in relation to the public, civic sphere of life, and is exemplified by the work of Putnam (1993, 1995, 2000). He sees social capital as both aspects of social structure and attitudes facilitating cooperation and coordination for mutual benefit (Putnam, 1995). The origins of this communitarian approach can be traced back to the work of de Toqueville (1961/1836), who observed in his travels to the U.S. that a vibrant civil society was the source of a well-functioning democracy, and Durkheim, who attributed a great strength to socially integrated, 'organic' societies (Durkheim, 1893/1973). In line with de Toqueville, Putnam (2000) sees associational life as a school in democracy. The social interactions within these networks socialize an individual in democratic and cooperative values and norms, such as generalized trust and tolerance. Therefore, the existence of horizontal voluntary associations, next to a certain path-dependency due to the historical legacy of civic engagement, are crucial factors in explaining the institutional and economical differences between governments, a thesis Putnam (1993) tested for the regional governments in Italy. As an advocate of strong democracy (Barber, 1984), the idea that politics should be embedded in everyday life, Putnam therefore sees the alleged decline of associational life in the United States as detrimental to the health of its political system (2000). The association between social participation, a higher amount of general trust and civic attitudes has been illustrated extensively (Almond & Verba, 1963; Barnes & Kaase, 1979; Hooghe, 2003), but the micro theoretical foundation of Putnam's social capital theory, that generalized trust and reciprocity are generated by participating in associations, has been disputed. It is equally plausible that people who trust more, participate more, and hence there is a self-selection effect (Newton, 1997; Uslaner, 2002). Nevertheless, or maybe because of this endogeneity problem, Putnam's influential approach to social capital places the attitudinal component central, and mainly investigates the societal and institutional correlates of generalized trust and democratic or civic values. The spread outside of academia of the social capital concept to policy is largely due to this modification. A related approach is the institutional perspective on social capital, exemplified by Skocpol (1995) and Knack and Keefer (1995). This approach takes its conceptual framework mainly from Putnam's work, but sees social capital as a product of the legal, political and institutional environment

(Woolcock & Narayan, 2000). In contrary to Putnam, who assumes a bottom up mechanism, the institutional perspective assumes that institutions in se create the conditions for trust, civic attitudes and social connectedness.

1.2.1.2 Social capital as a private asset

The second approach, defining social capital in terms of a private asset, rather than a public good, finds its origin in the work of neo-structuralist sociologists in the tradition of Weber, such as Bourdieu (1986), Coleman (1988), Flap (2004) and Lin (1999). To fully understand the theoretical framework of the utilitarian approach to social capital, a small excursion on the assumptions of human behavior is necessary. Departing from a rational choice point of view, that of the 'homo economicus', it is assumed that the main goal for a human being is to improve one's life chances. Scarce resources, such as wealth or status, are valuable assets, as they help in achieving this goal. Since these resources are not equally distributed, they provide the foundation for stratification. Those with more resources will better succeed in reaching their goals, than those with fewer resources. Rising, or even keeping one's place, on the societal ladder is accompanied by securing more resources, and hence acquiring more resources is the basic motivation for human behavior.

An important point in this framework is what these resources exactly are. Both Marx, focusing on wealth, and to a larger extent Weber, who distinguished not only economic, but also symbolic and political resources, paved the way for multidimensional conceptualizations of capital. A first influential use of social capital as an individual asset, by Pierre Bourdieu (1986), described it as one of the forms of capital, next to symbolic, cultural and economic capital. Although Bourdieu himself focused his attention on symbolic capital, and the conversion between the different forms of capital, his definition of social capital is seen as one of the most precise and relevant (Portes, 1998). For him it is the aggregate of the actual and potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition (Bourdieu, 1986). Lin (1999) and Flap (2004) further elaborated on this notion of social capital as the accessible resources embedded in social networks. The information, influence, social credentials and reinforcements that can be accessed through one's social relations directly and indirectly, are social capital for them. Lin further distinguished instrumental from expressive outcomes (Lin, 1999). Instrumental outcomes, such as a rise in economic, political or social position, have been studied quiet extensively from this perspective (Flap, 2004). Instead of focusing on

instrumental actions and resources such as power, social status and wealth, we are more interested in the expressive actions (Lin, 1986, 1999), with resources such as emotional support (infra).

A second important influence on the development of this approach to social capital is James Coleman (1988). For him social capital creates a possible link between a sociological and an economical analysis of the social action problem. While a sociological approach leaves little space for individual decision, as an actor is seen as determined by his environment, economists tend to see the rational actor too atomistic, not taking into account the social context. An essential step in Coleman's framework is the idea of a system of credit slips. By doing someone a favor, and trusting the other to reciprocate it in the future, an obligation is established (Coleman, 1988, p.102). In this way social relations become loaded with obligations and expectations and someone with a lot of outstanding credit slips, has access to a large amount of favors. An important precondition for this form of instrumental social capital is that it can mainly exist within a framework of effective norms and sanctions. Therefore Coleman extends his definition of social capital to include norms in a community, that make it possible to act against ones self-interest, but in the interest of the community. Although this uncovers the strong interrelations between on the one hand individual and collective aspects, and on the other hand relational resources and attitudes, it does not help us in clearly defining the concept. Coleman does however uncover a more solid micro sociological foundation for why norms such as trust go along with dense relational resource networks. The structural form of the social networks plays an important role in the generation of social capital. In a community where everyone knows everyone, behavior can be easily sanctioned. Likewise, in a community where people are not densely connected, reputation cannot exist. Coleman labels this densely interconnected type of network closure. From the network perspective, Ronald Burt (2000) has argued that in certain types of networks, where information and advice play a large role as resources, the position in a network is the main determinant of social capital. Filling a structural hole, meaning building a bridge between two otherwise unconnected groups in a network, gives access to a higher amount of non-redundant, unique information, and also puts the actor in the position of choosing with whom to share this information. Since the structure and form of social networks will be treated in detail in the next section, here I will not investigate this argument extensively. It is important for the definition of social capital, especially in social network analysis, to remember that social capital can also be generated by the structural position within a network. Since the

substantial analysis in this work is on survey data, and not on social network data, we cannot fully use Burt's definition of social capital.

1.2.1.3 A definition of social capital

In the previous section we outlined the two main theoretical traditions in social capital theory. We summarize the similarities and differences between both approaches, and describe how we will utilize social capital by constructing a working definition.

What is social capital? Capital is a production process, originating from a certain investment, creating a surplus value, and carrying the expectation of a future return. In the different theories overviewed, the emphasis was on different aspects of social capital. The communitarian approach, exemplified by Putnam, and placed the focus more on the surplus, the norms and attitudes generated. Bourdieu, Lin and Flap firmly underline the investment, in the form of resources, that is at the base of social capital. But both approaches agree that there is an aspect of future return, in the form of reciprocity, involved.

Both research streams have their own strengths and weaknesses when it comes to analyzing social capital in the context of well-being. On one hand, Putnam's approach has been fruitful in illustrating the influence of social connectedness and its attitudinal correlates in a wide range of behaviors, both on the individual and community level. The mechanisms at the individual level, describing how connectedness leads to civic attitudes nevertheless however are less firmly established. On the other hand, the utilitarian approach to social capital clearly addresses the individual level mechanisms, by investigating the role and function of resources. This focus on the actor and how he acquires (or loses) resources, however can lead to explanatory individualism. In other words, it can lead to explaining every social fact in terms of individuals and their characteristics, and neglecting the influence of community. This renders an evaluation of the precise role of context and community more difficult, especially in the case of ecological studies. A second, but less severe problem associated with the utilitarian approach for our framework, is that it is often applied to subjects in which the relevant resources are power and status, and not of a more emotional and expressive nature, as is the case with indicators of well-being.

A social capital definition that is useful for all the aspects of the research in this dissertation therefore may be an impossible task. Three central aspects of this dissertation are the focus on structural factors, the inclusion of both individual and community level outcomes, and the

subject at hand, well-being. The emphasis on structure and the importance for individual level outcomes point towards the direction of an utilitarian, network-based definition of social capital. Analyses on well-being related outcomes investigating the community level, nevertheless dominantly use Putnam's communitarian social capital approach, including its attitudinal components, and reserve the concept social networks for individual level social relations (Helliwell & Putnam, 2004; Kawachi et al., 1997a; Kawachi, Kennedy & Glass, 1999; Mohnen, Groenewegen, Volker & Flap, 2011). A middle of the road solution would be to distinguish micro-level social capital from macro-level social capital (Mohnen, Groenewegen, Volker & Flap, 2011). In this dissertation a stronger, more delineated and argumented choice will be made.

Because of the considerations mentioned above, two central concepts will be used. To avoid unnecessary confusion, social capital is reserved for individual level social relations, rooted in the approach of Lin (1999) and Flap (2004). In the analysis on the community level, rather than social capital, the concept of social integration is used to examine relations at the community level (infra), as the role of attitudes and trust are not investigated. This dual approach has the clear benefit of conceptual clarity, and allows us to investigate structural properties of social relations both at the individual and community level.

Hence, the social capital definition used in this dissertation refers to the structural aspect of social capital, the networks, and the resources they contain. A loose definition could be 'network capital', the form of social capital that makes resources available through interpersonal ties (Wellman & Frank, 2001). A second and more precise formulation of the same idea:

"Social capital can be defined as resources embedded in a social structure which are accessed and/or mobilized in purposive actions." (Lin, 1999, p. 35)

In this definition, the idea of access to social resources embedded in social structures fits our structural focus, and can be useful in investigating well-being at the individual level. The emphasis on purposeful action on the other hand is less directly related to the investigation in expressive and emotional actions. Although instrumental actions, such as for example looking for a job, rely heavily on conscious and rational use of the resources in one's network, this is less evident for outcomes that are health and well-being related. In other words, it is less certain that we use our friends and family consciously to maintain a high level of well-being;

this might as well be a by-product of having a resourceful and supporting social network, on which we can rely on in times of need. The question to what extent people act purposefully and goal rational in the context of well-being is a meta-theoretical question, which would extend far beyond the scope of this dissertation. Hence this last aspect of Lin's definition is not taken into account.

Further expanding on Lin's definition, a definition with three distinct theoretical elements was formulated:

"Social capital is made up of at least three elements: the number of others prepared or obliged to help, the extent to which they are ready to help, and what is at the other end of the tie." (Flap, 2002, p.36)

Flap's operationalization of social capital is useful in our research framework for a number of reasons. This definition is embedded in Lin's social capital approach, capitalizing on individual level social relations. It also emphasizes three aspects that will be of major relevance in this study. Firstly, the amount or volume of network contacts play an important role in health and well-being, as the large literature confirming negative effects of social isolation illustrate (infra). Secondly, these contacts do not only have to exist abstractly, but should be willing and able to provide resources and support. This can be seen as an aspect mainly referring to the difference between strong and weak ties. A last aspect is the diversity, size and accessibility of the resources embedded in social networks, either in the relation itself or second-order resources, belong to the network contact (Boissevain, 1974)
In this way social capital in this study is symbolized by the volume, closeness and diversity in embedded resources of one's social relations. In the next section each of these aspects will be outlined more in detail, by focusing on the theoretical aspects of social networks.

1.2.2 Social networks

In this section we will introduce the notion of social networks, and expand on the three key aspects of our definition of social capital. Following Lin (1999), we see social capital as the resources embedded in social networks. As described earlier, Flap's definition of social capital emphasizes three core theoretical aspects: size, closeness and resources. Each of these aspects will be put in a wider theoretical perspective, using the available literature to illustrate the relevance in relation with health and well-being.

Social networks by now have become a familiar notion in day to day language. This is mainly due to the popularity of social networking websites such as Myspace, Facebook and LinkedIn, of which the amount of internet traffic has vastly surpassed the online search for erotic content (Tancer, 2008). The small world hypothesis, Milgram's idea that we are all connected through a maximum of 6 different persons, has become more and more tangible because of this. Although the existence of online social networks has opened up a whole new area of research (see e.g. Wellman et al., 1996), in this study we restrict ourselves to a classic sociological perspective on real-life social networks (see e.g. Marsden, 1987; Fischer, 1982; Völker, Flap & Lindenberg, 2007) which emphasizes the importance of the context of individual actors in the form of the structure of their relations. As such, social networks in this dissertation can be defined as the structural form of social relations.

Furthermore, although social networks are analyzed, we are not doing social network analysis in the strict sense of the term. Social network analysis rests on three underlying assumptions (Knoke & Yang, 2008). First of all structural relations are thought to be of more importance than attributes such as age, gender, values, etc. Secondly, social networks affect perceptions, beliefs and actions through socially and relationally constructed complex mechanisms. A last assumption is that these structural relations are dynamic, and hence networks continually change.

In this work, the analysis will focus on the first part of this definition: how important networks are, compared to socio-demographic background variables. Theoretically, we will also expand on the mechanisms through which networks influence behavior. The changing nature of networks and positions within the network, is something we cannot investigate, as we do not have the required longitudinal and complete network empirical material, but work

from an ego perspective. For the same reason we will also focus on the actor, and less on the structural properties of the network.

Even though social ties are seen as the structural part of social capital, social connections are usually measured narrowly, through proxy's (Stiglitz, Sen & Fitoussi, 2009, p.184).[1] In most large scale surveys social networks are narrowed down to membership of voluntary associations. Although participation in civil society is one possible measure of social capital, in Putnam's approach, it is only a part of the picture. Social relations in which trust and reciprocity are to be found, can be formed in every life-domain, and not only in associational life (Coleman, 1998). Social network studies have shown that next to more formal relations, such as associational and professional ties, a wide range of informal relations, such as family, friends, neighbors and acquaintances have an impact on well-being, both for the individual and the community at large (Völker & Flap, 2007; Wellman & Wortley, 1990).

To understand social networks as an analytic notion, it is important to expand on the structure and characteristics of personal networks. In line with our definition of social capital, three central aspects of social networks will be highlighted. A first important factor is the size of networks. Size can be seen as an indicator for the volume of social capital (Bourdieu, 1980). A second central aspect is the difference between intimate, close and bonding social ties and more distant, superficial bridging ties. This distinction ties in with an earlier discussion on network position and structure, and which position has the highest amount of social capital (Burt, 2000). A third essential issue in networks is the diversity in the resources that can be accessed (Lin, 1999; Van der Gaag, 2005). A last issue we want to address is how social networks can influence individual level health and well-being outcomes.

1.2.2.1 Network size

A first aspect is the size of a network. Size is important, since in general having more social ties equals having more possible ways of access, to more diverse network resources (Fischer, 1982). As such a large network is an important determinant of having a larger volume of social capital (Bourdieu, 1980; Van der Gaag, 2005). The size of the network can be seen as

[1] Some notable exceptions are Burt, 1984; Lazarsfeld & Merton, 1954; Lin & Dumin, 1986; Wellman, 1979.

an indicator for social support (Marsden, 1990; Pugliesi & Shook, 1998). Typically, higher educated and those with better jobs have larger networks (Fischer, 1982).

An important addition is that the network contacts have to be willing to give access to these resources (Flap, 1999). Having a very small social network is commonly labeled social isolation. The negative consequences of social isolation span many domains. Social isolation has been associated with extreme right voting (Billiet & de Witte, 1995; Mayer & Perrineau, 1992), lower cognitive functioning and performance (Ybarra et al., 2008), lower stress resistance, higher prevalence of depressive symptoms (Kawachi & Berkman, 2001), lower levels of antibody response in influenza immunization (Pressman et al., 2005) and a higher risk for coronary heart disease (House, Landis & Umberson, 1988). In the context of well-being and health social isolation is related to higher mortality to the same extent as smoking is (House, Landis & Umberson, 1988). As such, having a very small network has only negative consequences.

In contrast, having a larger social network has mainly positive aspects. People with larger networks have more diverse networks (Marsden, 1987), which means potential access to more diverse resources (Haines & Hurlbert, 1992; Wellman & Gulia, 1999), and therefore a higher availability of both instrumental and expressive resources (Wellman & Frank, 2001). At the same time, this higher degree of connectedness also means more vulnerability, as people with a large network are exposed to a wider range of influences. It has been illustrated in the case of infectious diseases such as influenza that people with large networks catch the disease early, and furthermore help it to spread quickly (Keeling & Eames, 2005; Volz et al., 2011).
Of course the gains of having a larger social network diminish or disappear after a certain size. It has been shown by Van der Poel (1993) that the perceived gains of a contact, in the form of the likeliness to discuss personal problems and the weight attached to the relationship, increase when there are fewer contacts. In other words, having a large network can diminish the usefulness and attachment to each network member. Since relations need to be maintained, there is a maximum amount of time and resources one can spend on them.

When thinking about the optimal network size, it is important to keep in mind that not all social relations have equal value. As the difference between close, intimate bonding ties, and bridging, more instrumental ties will be treated in detail in the following section, I will not go into detail here. But because of these different types of social relations, different numbers

surface depending on how networks are delineated. Estimating an average person's complete network of active social relations is rather difficult, as measurements are unreliable (Killsworth et al., 1990). Experimental methods have shown that the average active total network size is about 125 (Dunbar & Hill, 2003). As the research at hand leans closer to the egocentric network approach, focusing on one actor and his network, the size of the close network matters most. On average people discuss intimate matters with 2-3 persons (Marsden, 1987; McPherson, Smith-Lovin & Brashears, 2006; Mollenhorst, Völker & Flap, 2008), and the intimate circle of social relations is composed by 12-15 persons (Fischer, 1982; Grosetti, 2007; Völker, Flap & Lindenberg, 2007).

In conclusion, network size can be seen as a relevant indicator for social capital. Social isolation has been linked to a large amount of negative outcomes, while social popularity, or having a large network is linked mainly to positive outcomes.

1.2.2.2 Network intimacy: Bonding and bridging ties

A second important aspect of social capital, seen as resources embedded in social networks, is the quality of the relation itself. In conceptualizing the difference between close relations between similar people and more superficial relations between different people, I will use the influential distinction between bonding and bridging capital, formulated by Putnam (2000). By connecting this two types of social capital to the insight that weaker ties can also generate social resources (Granovetter, 1973), an operational classification of social ties, or the connections within a network, is defined.

A specific interest in the composition of one's social ties can already be found in work on group affiliations in the early days of sociology. According to Simmel (1922/1955), in pre-modern society one's web of social relations is embedded in concentric circles such as family, neighborhood and workplace. Kinship and locality determine one's social relations to a large extent, and one cannot create ties to a different social circle without being member of an embedded smaller one. In modern society this isn't the case anymore, and the individual is seen as the node connecting different spheres of social life (Simmel, 1922/1955). One's family, friends circle, colleagues and religious affiliation are seen as loosely connected, but not completely determined by each other. Despite the possibility to connect with a wide

variety of people, one of the general laws of social networks is that birds of a feather flock together (Lazarsfeld & Merton, 1954). People with similar backgrounds, living in the same region, with similar opinions, have a larger chance of knowing each other than people with different backgrounds, living in different regions, with different opinions. The observation that similarity breeds connection has been documented in a number of life domains such as marriage, friendship, residency, religious affiliation… (McPherson, Smith-Lovin & Cook, 2001). To explain the enduring similarity in social networks on social characteristics, Feld (1981) turned to social foci, defined as any social, psychological or physical entity around which joint activities of individuals are organized. Since people choose one focus over another, it works as a constraining factor in forming social relations, and as more time is spent in one focus, the chance of developing positive social relations augments (Homans, 1950). Since socially similar people have a high chance to have similar interests, attend the same events, the social focus theory serves as an explanation for the high amount of similarity in networks.

The social capital that is generated in these homogenous networks is often coined bonding social capital. Bonding social capital (Putnam, 2000) could be traced back to the kind of solidarity Durkheim (1912/1968) associated with participation in community rituals, for him the key to social integration. The solidarity is only extended to group members, it entails mostly emotional support, and focuses on the needs and interests of group members. A second important base to understand the workings of bonding is the attachment theory of Bowlby (1969). In this theory, attachment is the primary motivational system, which provides an external ring of psychological protection (Bowlby, 1969). For him, marriage, or in contemporary terms partnership, is the solid base from which an individual can explore the world enmeshed in a protective shell in times of need, as it provides nonmaterial resources such as love and security (Holmes, 1993; Berkman & Glass, 2000).

These strong ties are formed within groups and communities, which already gives a hint at the problems associated with bonding ties: they are often exclusive. Furthermore, since they occur in homogenous groups, they can be parochial and inward-looking, and the tight bonds of trust may prevent members from reaching their full potential (Portes & Landolt, 1996). Thick trust is generated by intensive, regular contact between people, making social control possible (Putnam, 1995; Coleman, 1988). Burt (2000) characterizes the kind of social capital generated by networks where everyone knows everyone, also known as network closure, information flows very easily, and social norms are strong, as social cohesion. These strong

ties between similar people, mainly kin and close friends, are classified as bonding ties. In this dissertation, bonding social capital hence is defined as the resources embedded in close, intimate ties between similar people.

Next to strong ties within groups, ties between social groups also play an important role as generators of social capital (Woolcock, 1998). Granovetter (1973) states in a seminal study that the strength of a tie is inversely related to the homogeneity of both parties involved. Therefore weak ties make a wider diversity of information and resources accessible, through a wider diversity of the contacts. Building bridges between different circles hence can be beneficial. These holes in the social structure create opportunities for the ones building the bridges, or in other words, the network brokers (Burt, 1992). If one has access to different kinds of networks, one can control the flow of information from one network to another. The most valuable network resources are the ones who come from a different relatively closed network. The advantage of weak ties and structural holes, have been illustrated in early promotion in managers (Burt, 1997), differential influences in job finding (de Graaf & Flap, 1988; Lin, Ensel & Vaughn, 1981), in the success of creative occupations such as photography (Giuffe, 1999), and even in the successful political career of Cosimo de Medici (Padgett & Ansell, 1993). Sometimes weak ties can pose a threat, instead of being an asset, as has been thoroughly illustrated in the case of the former German Democratic Republic by Völker and Flap (1995, 1997, 1999, 2001). Because one never could be sure if state or party organs were spying on one's private life, or if one's neighbor was an informant, weak social relations were kept to a minimum (Völker & Flap, 2001).

In a similar vein, social relations within the neighborhood have often been seen as weak ties (Henning & Lieberg, 1996; Kearns & Forrest, 2001; Sampson, 2004). It has been shown that these ties especially important for those that cannot easily leave the neighborhood, such as the elderly, the poor and single parents (Fischer, 1982). Neighborhood ties are important in building a local community, as these ties can help in achieving social and physical well-being (Völker, Flap & Lindenberg, 2007; Lindenberg, 1996; Sampson, 2004). As the community question will be tackled in a separate section, here I limit the discussion to pointing out the relevance of weak ties for local communities.

Furthermore bridging ties also prevent the negative outcomes of too much "social glue", like prejudice towards others, and widen the perspective through contact with others (Allport, 1954; Pettigrew & Tropp, 2006). Weak ties link members of different social groups, and are therefore the basis for integration in contemporary society (Newton, 1997). Since diversity in

society is growing at a very fast rate, bridging social ties are seen as an effective tool to handle these differences. Since diversity is a relatively vague term, it may be helpful to distinguish between different forms of bridging ties. Identity bridging ties are links between culturally defined group differences such as ethnicity, sexual preference, religion, etc., while status bridging ties are associated with the socio-economic stratification of society (Wuthnow, 2002). As such, bridging social capital in this dissertation is seen as the resources embedded in more distant social relationships, such as friends, acquaintances and neighbors, characterized by a larger degree of dissimilarity, either in age, ethnicity, religion or social status.

It is clear that the conceptual division between bonding and bridging ties facilitates an analytical perspective on social relations. Both kinds of ties are necessary, or as Putnam (2000) states: bonding capital is good to "get by", but bridging capital allows one to "get ahead". A second remark is that, depending on what perspective one has, bonding and bridging can signify different things. Studies using the neighborhood as a unit of analysis see ties within the neighborhood as bonding. Approaches placing emphasis on the social ties themselves, usually reserve bonding ties for close, thick and strong ties, between similar actors, such as those between family and close friends. Since in this dissertation social ties are examined, this last, dominant approach is used, and ties are considered as bonding if they are strong, such as kin or close friends, between similar people, and bridging if they are weaker and between socially more distant people. Relying on the theoretical reasoning that homophilous ties tend to be strong (Granovetter, 1973, 1983), and strong empirical evidence that this is so (Burt, Marsden, & Rossi, 1985; Marsden, 1986; Marsden, 1988) the vast majority of social relations will fit into this binary scheme.

Nevertheless, strong ties between socially distant groups also exist, for example intergroup marriage, or heterogamy. The literature on educational, religious and ethnic heterogamy shows that heterogamous marriages tend to dissolve easier than homogamous marriages (Kalmijn, de Graaf & Janssen, 2005; Tzeng, 1992). Similarly, Wilson (1987) has pointed out that in disadvantaged neighborhoods, local ties exist, but that they are between socially similar people. As such, these ties are wider than the intimate close circle, but nevertheless do not give access to diverse resources. These social relations combine characteristics of bridging/bonding and strong/weak ties in a different way, and can be hence be seen as specific mixtures, but with the emphasis on either bonding or close aspects of our definition.

A last remark on bridging and bonding ties, it that they usually are also measured in different ways. To elicit close ties, respondents are asked with whom they do certain things, such as talking about personal matters, inviting them to the house, asking for advice, etc. This measurement method is called the name generator (McCallister & Fischer, 1987). Bridging social capital is investigated in a different way, by asking the respondents if he knows someone who belongs to a certain socio-economic layers or has certain resources. These measurement instruments, such as the position generator (Lin & Dumin,1986) or resource generator (Van der Gaag, 2005), are less time consuming and provide a good overview of one's weak ties.

1.2.2.3 Network resources

A third aspect of our social capital definition is what is at the other end of the tie, or the actual social resources. The social resources that matter of course depend strongly on the actions being studied. Lin (1986) divides social action conceptually according to its nature: instrumental action is motivated by the intent to gain valued resources, such as power, wealth and status, while expressive action is motivated by the intent to maintain valued resources, such as well-being or life satisfaction. Most research coming from the social resources direction has focused mainly on instrumental social actions, such as getting a better job (Lai, Lin & Leung, 1998; Lin, Ensel & Vaughn, 1981; de Graaf & Flap, 1988). The influence of personal resources on resources of mobilized contacts and job attainment is investigated. It seems that while weak ties are important as a social resource, strong ties are more relevant for top level positions (Lin, Ensel & Vaughn, 1981). Similarly, weak ties also seem less effective for those at the bottom of status hierarchy, which is probably due to their restricted range of contacts (Campbell, Marsden & Hurlbert, 1986).

In this study, we will focus on the expressive actions, related to well-being. In regard to that, Lin (1992) states that expressive actions hypothetically would benefit more from homophily, in contrast to the strength of weak ties arguments of instrumental actions (Granovetter, 1973). It has to be kept in mind, that in real life social networks these phenomena are interrelated and present in both bonding and bridging ties. As sometimes exactly these bonding ties are the source of loss in life satisfaction, as in the case of divorce (Lin & Westcott, 1991), weak ties can also provide both emotional and instrumental resources needed to build it back up. Within

the framework of these expressive actions, a more useful and developed approach to investigate social resources in contrast with personal resources is social support. In psychological and medical literature, the concept social support is used to describe the wide variety of resources that run through social networks (Berkman & Glass, 2000; House, 1981; Hobfoll et al., 1990; Uchino, Cacioppo & Kiecolt-Glaser, 1996). Social support has been found to be an important factor in subjective well-being, mental health and physical health (Berkman & Syme, 1979; Ensel & Lin, 1991; House, Landis & Umberson, 1988).

More precisely, Cobb (1976) provided a first and influential definition of social support, namely that it is the individual belief that one is cared for and loved, esteemed and valued, and belongs to a network of communication and mutual obligations. When thinking about social support in networks, it is important to keep in mind that not all ties are supportive, and that there is variety in the type, frequency and intensity of support (Wellman & Frank, 2001).

House (1981) divides social support into four subtypes: emotional, instrumental, appraisal and informational support. Emotional support is most often received and given within the closest, most intimate ties, and is related to the amount of love and caring, sympathy and understanding, and esteem or value available from others (Thoits, 1995). Assistance with more material and practical needs is a more instrumental form of social support. Help in making decisions or giving feedback is defined as appraisal support. Informational support consists out of giving advice or relevant specific information.

Next to this use of social resources as a rational actor, to maintain or gain resources, they also play an important role in a person's identity (Hobfoll et al., 1990). Identity formation is a product of the protection and promotion of valued states. Close attachment with a significant other contributes to the formation of social identity and the view of self as valued or valued and deserving for love and appreciation.

In line with Lin (1999), I assume that in general bonding, close ties mostly act as support networks, or "those social interactions and relationships that provide individuals with actual assistance or with a feeling of attachment to a person or a group that is perceived as caring and loving" (Hobfoll & Stokes, 1988, p.499). Weak bridging ties are seen more as networks through which information and instrumental resources, such as status or power, can be accessed.

1.2.2.4 Networks mechanisms on the individual level

A last important theoretical addition to the overview of social networks is how exactly they influence behavior. The scope of this exploration is limited to outcomes related with health and well-being, since a full overview of all the possible mechanisms in all the possible domains would lead us to far away from our subject. In a seminal article, Berkman and Glass (2000), outline five different pathways through which social networks can influence health behavior.

A first, and often seen as the most important and direct pathway is social support. Extensive research has illustrated that social support acts as a buffer, protecting people from potentially harmful and pathological effects of stressful events (Cohen & Wills, 1985). Hobfoll et al. (1990, p.466) state that a stressful event occurs when circumstances threatens or result in loss of personal and social valued resources, such as objects (e.g. car), conditions (e.g. job security), personal characteristics (e.g. sociability), or energies (e.g. money) that are valued by the individual, or that serve as means of obtaining what is valued by the individual. A straightforward example of the buffering effect of social support is a shoulder to lean on in hard times.

A second important pathway is social influence. Interpersonal influence can shape opinions and the behavior that follows from it, since people obtain normative guidance by comparing their attitudes to a reference group or similar others (Erickson, 1988). Shared norms around health behaviors can be powerful ways of influence in social networks. Imitation is another way to state this social influence.

A third important pathway is social engagement. Social participation is both a way to reinforce and define meaningful social roles, providing a sense of belonging, and provide opportunities for companionship and sociability. The role of social engagement should not be reduced to social support in itself, as longitudinal research has illustrated that there are positive consequences of participating in a meaningful social context in itself (Rook, 1990). In old age, social engagement is related to the maintenance of cognitive function in old age and reductions in mortality, independent of emotional or instrumental support (Glass et al., 1999).

A fourth possible influence of social networks on a person's health is through person-to-person contact. As this is mainly a pathway relevant for infectious or transmittable diseases,

and not for less tangible aspects of health such as well-being, we will not dig deeper into this mechanism.

A fifth way in which social networks can influence health and well-being is by access to material goods, services and information of network contacts, a pathway we have already explained in the section on the strength of weak ties. Boissevain (1974) has called this second-order resources.

1.2.3 Social relations and context

In this part of the theoretical chapter, the associations between social relations and geographical context will be examined. From social networks at an individual level I change the focus to social relations at a collective level, by using the concept of social integration. By tracing the origins of this concept and a short exploration of its effects, a definition is formulated. Furthermore the criticisms on this community level approach are investigated, and the choices made in this study are justified.

1.2.3.1 Social integration: a community approach to social relations

As stated before, authors in the line of Putnam (1993, 2000) refer to this ecological perspective on social relations as social capital, which I have reserved for individual level explanations. Instead I use the classical concept of social integration to analyze the extent to which social relations within a community flourish. Social integration as an analytical concept was established by Durkheim but never explicitly defined by him. In 'The division of labour' (Durkheim, 1893/1973), he outlines two ideal types of solidarity, stressing that social integration depends on the community context one is studying. Pre-modern, traditional communities, with a low degree of labor division and specialization, putting the emphasis on the similarity of its members, on identical viewpoints and norms, have a mechanical form of solidarity. Industrial, modern communities on the other hand are highly complex and specialized, creating multiple links of interdependence among its members. Solidarity was not based on similarity anymore, but on the interdependence created, and hence it changes from a mechanic form to an organic solidarity. These solidarity concepts echo Tonniës (1887/1955), and his distinction between 'Gemeinschaft' and 'Gesellschaft'. An important difference is that

Tonniës negatively evaluated the evolution from strong bonds between similar people to weaker bonds based on exchange, while Durkheim was more optimistic. This classical dichotomy in forms of social integration can also be seen in connection with the structure and aspects of social networks reviewed earlier. Bonding ties between similar people, providing social support and social control, are linked to mechanical solidarity, while weaker bridging ties, providing diverse information and resources, are closer to organic solidarity.

Durkheim's seminal contribution to the development of the social integration perspective was the practical application of it in his examination of suicide rates. He contrasts social integration with normative regulation, in a similar way as structural features of social capital are distinguished from normative aspects by Putnam (2000). Normative integration is the alignment of personal values with societal norms, and a rapid societal change or a fast personal evolution in terms of social status can disrupt this match. In extreme cases of normative disintegration, Durkheim (1897/1983) states, underregulation of personal norms leads to anomie, or normlessness, while overregulation induces fatalistic suicide. The idea of mismatch between personal values and societal norms has been a major concern in functional sociology (Parsons, 1951). Social integration on the other hand, can be seen as the degree to which people have social bonds in different life spheres. Fulfilling these different roles, as a partner, colleague, friend or relative, contributes to health and well-being by providing a purpose to life and building ones identity (Thoits, 1983). A lack of social integration, commonly described as social isolation, can lead to egoistic suicide, while too much integration can lead an individual to sacrifice his life for his community in an altruistic suicide (Durkheim, 1897/1983).

In our times, the term social integration has become more and more associated with the integration of immigrants in society. Social integration is seen as a middle of the road position between segregation or exclusion, and assimilation of migrants. This adaptation from the part of the immigrants is deemed necessary to prevent interethnic conflicts and preserve the national identity, and often is a precondition to acquire rights as a denizen or citizen. A thorough discussion on concepts of citizenship would lead us too far away from our topic, therefore the scope of this section is limited to the influence of diversity on community integration. More diversity is often seen as detrimental for social capital at the community level (Putnam, 2007). Similarly, clear ethnic disparities in crime offenders (Sampson & Lauritsen, 1997) and use of mental health care (Chow, Jaffee & Snowden, 2003) form the

base of covert or blunt racist rhetoric, although concentrated deprivation has been shown as the primary cause of these disparities, and not ethnicity in itself (Shaw & Mckay, 1942; Wilson, 1987). As it is a fundamental aspect of community, social integration in our view encompasses diversity. At the measurement level diversity can be translated in different forms (Jacobs & Rea, 2009). As nationality is a more solid standard than the concept of ethnicity (Zagefka, 2009), in the community level analysis diversity is seen as both the proportion of foreigners and proportion of non-European foreigners.

As contemporary and operational definitions of social integration in the literature for our approach are absent, an own working definition is formulated. Social integration is seen as the community level aspects of social relations in different life domains, reflected in both the aggregate of individual level social involvements, such as having a partner or being unemployed, and true community level contextual information, such as the level of ethnic diversity or income inequality.

1.2.3.2 Effects of social integration

The importance of social integration by now is widely recognized on the individual level (supra), not only in relation with mental health (Seeman, 1996; De Silva et al., 2005), but also in relation with mortality (Berkman & Syme, 1979) and even the common cold (Cohen et al., 1997). In fact, social isolation has an effect on mortality similar to that of risk-behavior such as smoking and alcohol abuse, and exceeds the influence of obesity and physical inactivity (Holt-Lunstad, Smith & Layton, 2010). On the aggregate level, investigations of the role of social integration are relatively recent, with the exception of the social disorganization perspective in criminology, although Durkheim (1895/1973) already gave the first push in this direction, saying that the first and fundamental rule of sociology is to consider social facts, meaning societal characteristics that are larger than the individual, as things in themselves. The social capital perspective has reemphasized this approach, as one of the main questions in this framework is to what extent individual level integration in society as a by-product produces externalities for the community (Kawachi & Berkman, 2000).

As most research focuses on either normative or the social participation aspects of social capital (Kawachi et al., 1997a), the aggregate effects of social integration in the family and

work domain on well-being have been investigated less thoroughly. Major exceptions are income inequality and ethnic diversity, purely aggregated social facts. The relevance of income inequality to health gained prominence through the work of Wilkinson (1996), who illustrated that life expectancy on the country level had both a strong negative relation with income inequality, and could only be explained weakly by GDP. Within countries income inequality has also been linked to higher mortality (Kennedy et al., 1996), higher crime rates (Merva & Fowles, 1993) and lower self-rated health (Kawachi et al., 1997b). The diversity of a community on the other hand, has been investigated from the typical social capital perspective. While Putnam (2007) sees diversity as detrimental for community integration based on data from the United States, from a European perspective this assumption has been disputed (Hooghe et al., 2009). Similarly, the community effects of high unemployment (Clark & Oswald, 1994; Oswald, 1997), high proportions of single households (Siahpush & Singh, 1999) and diversity are not reducible to the sum of individual effects on well-being.

1.2.3.3 Criticisms to community level analysis

In large, two main points of criticism have been addressed to this community approach to investigate the importance of social relations since Durkheim's days, and they remain important points to this day in any analysis on a collective level. The first point is the question of the correct level of analysis, while the second point is concerned with the nature of ecological effects.

Durkheim analyzed differences in suicide rates between countries. An important point of attention is to what point differences within countries are more substantial than differences between countries. Structurally similar communities, such as large cities in two different countries, could have more things in common than they have with small villages in their own country. In a similar vein, one could say that neighborhoods within a city are a better level of analysis as they capture the living environment better. Lower levels of aggregation, such as city or neighborhood level, could hence be seen as more appropriate. On the other hand, community aspects that influence our lives are not limited to the neighborhood or city we live in, especially in this age of globalization. The question of the adequate level to study community influences on social relations, is an issue running through the development of

urban sociology, and has been adequately described as the community question (Wellman, 1979).

In early urban sociology, the city, seen as the hallmark of modernity, was usually contrasted with the pre-industrial, bucolic village. On a psychological level, the city and its intense atmosphere, overstimulating the senses, demand its inhabitants to take a more rational, distant way of handling social relations to maintain mental sanity (Simmel, 1905/2002). On a structural level, because of the large heterogeneity in terms of jobs, neighborhoods, and interests, interpersonal relations in an urban setting are more segmented and shallow and undermine kinship bonds (Wirth, 1938). This double malicious influence of the city on human relations and social integration, leads to anomie, in a Durkheimian sense, since 'true', bonding, social ties within the family are lost. From an analytic point of view, it is interesting to note that this explanation of social disintegration is entirely on the contextual level, and it's the city in itself that causes the weakening of community ties (Fischer, 1975).

Later studies countered this supposed loss of community in the city. Firstly, by illustrating that not all neighborhoods in the city are as dense and heterogeneous as described earlier, pointing out the difference between inner city and suburbs (Gans, 1968). A second argument to counter the loss of community, was an emphasis on the strong local bonds that exist in these urban neighborhoods (Jacobs, 1961; Park, 1952). In the social disorganization perspective, these local networks are crucial in establishing a form of community, and hence also the ability to enforce social control (Shaw & Mckay, 1942). Neighborhood-level street crime within a city does seem to be related to the absence of local ties, of which one of the causes is little residential stability (Sampson, Raudenbusch & Earl, 1997). Recent research in the Netherlands on which kind of neighborhoods are also communities showed that a number of contextual factors do contribute (Völker, Flap & Lindenberg, 2007). Most important are interdependencies between residents, and the intention to stay in the neighborhood. The presence of facilities also plays a significant role. A last issue contributing to more community was more homogeneity. Urbanity in itself didn't play a role, and as urban neighborhoods usually have more facilities, they could be seen as more privileged in this regard.

Both of these approaches presuppose that social relations, and hence communities, are based on close geographical proximity. In a novel approach to the community question, based on

personal social networks instead of geographical boundaries, Wellman (1979) showed that solidarity in the form of social support does exist in the city. This community does not take the form of 'urban villages', as the urban neighborhood approach suggests, but is "dispersed among multiple, sparsely interconnected social networks" (Wellman, 1979: 1207). Further examining structural differences in personal networks, Fischer (1982) observed that urban social networks are composed of fewer family members, but more friends, and are less dense than rural networks. Instead of being constrained by the availability of people in ones neighborhood, people move around and have their own personal networks. Other authors have argued that presence is a first condition for social contact (Blau, 1977), or stated differently, "personal networks are the result of individual choices made within the constraints of the context" (Fischer et al., 1977 in Mollenhorst, Völker & Flap, 2008). Although this context does not need to be limited to the neighborhood, people do tend to form most of their face-to-face close personal networks in a relatively small perimeter of about eight kilometers (Mok, Wellman & Basu, 2007). This does seem to point to the scale of an average municipality or city as a good level of analysis for close networks.

Apart from this theoretically grounded argumentation on the municipality level, from a policy perspective it can also be seen as an ideal level of analysis. The municipalities have a large degree of autonomy on the way they spend their budget, including for social services and policing, while neighborhoods are less powerful levels of governance. In this way, results from this study can easily find their way to municipality politics. Furthermore, from a practical point of view, a large amount of statistical information has its most detailed information on the municipality level. Although in large cities neighborhood information is available, this is not always the case for each statistic, and certainly not for neighborhoods in smaller towns. A last reason why the municipality level is the level of analysis, is that except for the study of Völker, Flap & Lindenberg (2007), the mentioned neighborhood approaches have an additional bias, as they investigate neighborhoods within cities. As I am interested not only in the social networks of city dwellers and their relations with well-being, but in all inhabitants of the Flemish region, a municipality perspective is the obvious choice.

A second point of criticism to aggregate studies is due to the inherent difficulty of interpreting results correctly at higher levels. This argument was labeled ecological fallacy by Robinson (1950), in a prominent article where he illustrated that the correlation between illiteracy and skin color varies according to the level on which this correlation is measured. While at the

individual level this correlation was relatively low (.203), on the state level it was very high (.773) (Robinson, 1950). The ecological fallacy hence means drawing individual level conclusions from an aggregate level analysis. The emphasis on ecological fallacy among statisticians, for a certain period has led to an atomic or individualistic fallacy (Riley, 1963; Scheuch, 1969), by studying the effects of environmental factors through individual level models (Richards, 1996). This more methodological issue has had its implications on theory formation, and for some time has obscured mechanisms of influence of physical and social environment on human behavior (Macintyre & Ellaway, 2000). Recent methodological developments, such as multilevel analysis (Jones, 1991; Snijders & Bosker, 1999), have made it possible to correctly estimate the influence of factors at several levels at the same time, thus avoiding ecological fallacy.

Still, for some social phenomena such as for example suicide or crime, data on the individual level are simply not available or do not contain information relevant for analysis, so that ecological analysis might be useful. For example, an analysis of records of arrested criminals, containing only age, gender and nationality, cannot shed a light on the relation between the levels of crime in an area and unemployment or income inequality. Similarly, studying the community correlates of high suicide rates is impossible using only individual level data. When conducting analysis on the influence of place, an important distinction in terms of causal pathways is between compositional explanations and contextual explanations (Macintyre & Ellaway, 2000). A compositional explanation for spatial variations means that the differences in composition of each spatial unit are responsible for the variations. In that case, the area differences can be attributed to the fact that they are inhabited by different proportions of types of people. If younger people commit more crime, for example, a compositional explanation for differences in crime rates between two cities is that the city with the highest crime rates has a higher proportion of young people than the other. A contextual explanation on the other hand, means that there is a feature of the environment that influences those exposed to it. In the context of the earlier example, a contextual explanation for higher crime rates in a comparison between cities could be that in one city there is high unemployment, and in the other unemployment is low. It would be incorrect due to ecological fallacy to state that the unemployed commit more crime than the employed. But this does mean high unemployment rates create circumstances wherein crime flourishes, such as for example less parental control, more drug use, etc.

A second issue of importance in ecological spatial analysis is that two municipalities might influence one another. A municipality in the neighborhood of the big city might have some influence because of this geographical location. To take account of this spatial nature of the data, spatial regression techniques are used. Two forms of spatial models are commonly used to improve regressions on spatially correlated data. Theoretically, these two forms of spatial interdependence have a different interpretation. If two municipalities are adjacent, the crime rate of the first can be influenced by the crime rate of the other. This means that there is a contagion or dispersion effect of crime, represented best by a spatial lag model. If the error residuals of the municipalities are influenced by one another, this substantively means that the phenomenon under study is not analyzed at the correct geographical level, or that there might be an unobserved variable correlated with the spatial structure of the data. This would imply a clustering effect (for some unknown or unobserved reason municipalities resemble one another) and this has to be studied by a spatial error model (Anselin, 1988; 1994). A spatial lag model therefore is appropriate if neighboring municipalities influence one another; the spatial error model documents that municipalities geographically cluster but for an unknown reason.

1.2.4 Well-being

The following section describes how the theoretical framework is related to the main outcome studied, well-being. As two separate levels are addressed, it is important to distinguish individual level subjective well-being from community level well-being outcomes such as the suicide or crime rate. Next to specific explanations for each indicator, similarities are highlighted.

Well-being encompasses a large range of possible domains, so it is necessary to properly define the aspects that will be investigated, and how they are related. The growing literature on and interest in well-being can be explained from a change in thinking about what wealth is. While previously growth was usually seen as mostly encompassing the very narrow domain of wealth production, mainly the GDP, an international paradigm shift has recently been instigated by international institutions (European Commission, 2009; OECD, 2001, 2011; Stiglitz, Sen & Fitoussi, 2009; UNDP, 2010). Well-being is broader than only wealth, as some aspects of life are crucial but do not have a price (Frey & Stutzer, 2002; Kahneman et al.,

2004; Stiglitz, Sen & Fitoussi, 2009). Next to that, well-being does not only depend on the individual, but the environment plays an important role here as well (Sampson, 2003; Stiglitz, Sen & Fitoussi, 2009). This broader approach to wealth, comprising both objective and subjective individual indicators on the one hand and collective indicators on the other hand, is framed 'quality of life' (Haas, 1999; Nussbaum & Sen, 1993). In a nutshell, quality of life encompasses the ability to function effectively physically, emotionally and socially, while maintaining a sense of well-being (Levine, 1987). In this quality of life framework, three indicators associated with individual and collective well-being will be investigated: subjective well-being, suicide rates and crime rates.

1.2.4.1 Subjective well-being

A first and obvious judge of the quality of life is the individual itself (Diener, 2000). Campbell and Rogers (1972, as cited in Day & Jankey, 1996) estimate that the subjective component of quality of life is responsible for about half of the variation in quality of life.

Subjective well-being consists of both the emotional mood and satisfaction with life in general and specific domains (Diener, Suh, Lucas & Smith, 1999). Moods and emotions, termed positive and negative affect, reflect subjective well-being in the short term, while life and domain satisfaction are a more long term evaluation of well-being. As the role of relatively stable factors such as one's social relations and the municipality of residence is the main point of our analysis, I will investigate satisfaction with life.

Happiness, or its more cognitive counterpart life satisfaction or (subjective) well-being, can be regarded as a paramount striving throughout human history. On a collective level, democratic political systems ideally try to achieve the highest level of life satisfaction for most citizens. One of the rationales behind the welfare state is that by supporting citizens to achieve a minimum level of income and resources, their well-being is enhanced significantly, and avoidable suffering is reduced. On an individual level, people achieve happiness or satisfaction through self realization on a number of life domains, such as work, family, social life, etc. In a novel approach, Sen (1999) reconceptualizes the thinking about what is a good life in a good society. In a nutshell, Sen states that it is the opportunity to live a good life, rather than the accumulation of resources that matters most for well-being. This means that well-being depends not only on individual abilities, or social position, but that it is also dependent on the context, on the 'goodness of others', as Nussbaum (2001) phrased it. This

insight carries a long tradition, going from Aristotle's Nichomachean Ethics up until contemporary authors like Martha Nussbaum. Although research on the relation between social capital and subjective well-being is quite scarce, the idea that inclusion in society and social support matter is well documented in research on well-being (Helliwell & Putnam, 2004; Winkelmann, 2009).

1.2.4.2 Community well-being

In contrast to individual well-being, some social facts manifest themselves exclusively at the community level. These contextual phenomena are often seen as indicators of the amount of community present and the health of the social fabric of a certain place, and hence used as explanations for individual level well-being (Putnam, 2007; Sampson, 2003; Sampson, Morenoff & Gannon-Rowley, 2002). In this dissertation two of these community level indicators, the prevalence of crime and suicide, will be studied as they are closely related with a good functioning of community.

In addition, suicide and crime are associated in a straightforward manner with individual (mental) well-being. Suicide is the behavioral association of being at the extreme end of the continuum of mental well-being (Firestone & Seiden, 1990), and as such has been successfully used as a negative indicator for high subjective well-being in a locality (Helliwell, 2007). A community suffering from a high suicide rate clearly is not doing very well in terms of well-being. One can suspect an atmosphere of loneliness and social isolation is pervasive in high suicide areas. It has been shown that in areas with higher suicide rates, suicide is seen as a more acceptable solution to problems than in other areas (Stack & Kposowa, 2008). This leads to a vicious circle of higher suicidal tendencies. On the other hand, there is also strong evidence of suicide contagion, or a copycat effect. Already in the 18th century the publication of Goethe's 'Das Leiden des junges Werthers', sparked clusters of young people committing suicide, imitating the main character in the novel, which led to the banning of the book in several European states. Hence the positive impact, especially on adolescents, of media-coverage of famous or notable suicides on suicide prevalence was named the Werther-effect (Gould, Jamieson & Romer, 2003).

Crime on the other hand can be seen as a contextual constraint on one's freedom of functioning, as the capability to move around freely is an essential part of well-being (Sen, 1993). Apart from the evident and direct negative influence on an individual victim, crime indirectly negatively affects the mental well-being of a much larger group of people, who are not victims but live in the area where the crime was perpetrated (Cornaglia & Leigh, 2011). This destructive potential of crime for one's well-being was already noted by Jeremy Bentham (1781/1996), who named this the "secondary mischief" of crime. Fear of crime in itself can lead to avoidance behavior, lessen social interaction between inhabitants and install interpersonal distrust (Conklin, 1975). In itself, this lack of trust and willingness to cooperate leads to more social disorder and hence more crime (Sampson, Raudenbusch & Earls, 1997). As such, crime has been seen by several authors as a symptom of the breakdown of social control, either as a dark side of dense interconnected networks (Pattillo-McCoy, 1999) or as the loss of community altogether (Kornhauser, 1978; Sampson & Groves, 1989). Four interrelated mechanisms can be distinguished to explain a low level of community well-being (Sampson, Morenoff & Gannon-Rowley, 2002). The first perspective, on which this dissertation leans heavily, sees social relations as the main factor that makes or breaks a community (Coleman, 1988). A second approach, collective efficacy, states that social ties alone are not, enough, but that mutual trust and a shared willingness to intervene are equally import in community building (Sampson, Raudenbusch & Earls, 1997). A third way is the role institutional resources, in the form of meeting places, employment opportunities and activities play. A last approach investigates the land use and ecological distribution of daily activities, building upon the observation of Jacobs (1961) that mixed functional use of space is a precondition to urban communities.

By focusing on the community level, we return to one of the oldest traditions in social sciences, where community level integration was seen as one of the most important determinants of both suicidal behavior and violent crime (Durkheim, 1897/1983: p. 358; Halbwachs, 1930). The similar causes of suicide and violent forms of crime had already been noted on the individual level by Freud (1955, p.162) as suicide being self-directed aggression, whereas in the case of violent crime it is directed outward. Henry and Short (1954) stated that homicide and suicide are related to economic changes, and both phenomena are reactions to economic frustration, but by different classes. Lower classes, frustrated in times of economic growth, turn to violent crime, while higher classes, economically threatened in times of recession, choose for suicide.

More recent studies have shown that crime and suicide rates instead tend to go hand in hand, and are both caused by low levels of social integration and its consequences (McKenna, Kelleher & Corcoran, 1997; O'Brien & Stockard, 2006; Värnik et al., 2003). The causal similarity in explaining crime and suicide is so remarkable that leading criminologists have started to investigate health and well-being (Sampson, 2003) and leading epidemiologists are studying crime (Kawachi, Kennedy & Wilkinson, 1999; Wilkinson, Kawachi & Kennedy, 1998).

How does a lack of social integration cause such differential effects? It is important to take the specific nature of social relations into account. Close, bonding ties serve different needs than looser bridging relations. Both provide useful resources to the individual, respectively in the form of emotional support and access to information or second-order resources. A shortage of social support, more prevalent in communities with low levels of social integration, leads to lower levels of well-being. A low level of well-being can it its turn, and in interaction with other factors, lead to suicide. Similarly, a lack of bridging, diverse interpersonal relations isolates an individual from wider society and entrenches him in an environment of similars (Wilson, 1987). Such an area, with inhabitants who mostly rely on similars, and few links to the outside world exist, is aptly named ghetto, after the vernacular Venetian term for the neighborhood, or borghetto, where Jewish inhabitants were confined to live.

These two facets of social relations hence can have differential outcomes, depending on the mixture of them that is available, and the community context in which they are present. In other words, the same amount of social relations can produce a very different outcome in a wealthy community than in an underprivileged one (Sampson, Morenoff & Gannon-Rowley, 2002). This being said, in general low social integration and concentrated disadvantage tend to cluster in urban areas, while rural areas tend to be better off in terms of income, employment and social integration (Sampson, 2001). When analyzing both phenomena, three main explanatory frameworks are used: social integration, social deprivation and the urban rural divide. One of the confounding elements in this line of study, however, is the tendency to rely on a composite indicator for geographic area characteristics, taking into account various indicators simultaneously (see Congdon, 1996 for an example in suicide studies). The risk associated with this approach is that it can obscure the precise correlates, as different

kinds of community characteristics are lumped together. Therefore I will focus on distinct indicators, reflecting several dimensions of social integration, deprivation and urbanity. In themselves, these measures reflect different aspects of social relations, linked to both close social support relations and diverse bridging relations on the individual level.

1.3 Summary

In this theoretical chapter the main concepts of this dissertation are defined and placed in relation to each other. Social capital is seen as an individual asset, namely the resources embedded in social networks (Lin, 1999). Three important aspects of social ties in this study are the size of the social network, its composition in terms of bridging and bonding ties, and the diversity and nature of resources accessed through these ties (Flap, 2002). Larger networks can be expected to be at the same time more diverse, and hence give access to more and different resources (Haines & Hurlbert, 1992). Bonding ties play a main role in accessing emotional support, associated with expressive actions (Lin, 1986). Bridging ties are more relevant when investigating instrumental actions related to status, power and information (Burt, 2000).

Social integration is defined as the community level aspects of social relations in different life domains, reflected in both the aggregate of individual level social involvements, such as having a partner or being unemployed, and true community level contextual information, such as the level of ethnic diversity or income inequality. Although most approaches to social integration are limited to the individual level, as is the case for social isolation and unemployment, there is evidence that true contextual concepts such as income inequality (Wilkinson, 1996) and diversity (Putnam, 2007) have an influence on community well-being. Two main points of controversy surround community level analysis. The first is the community question (Wellman, 1979), which can be seen as a search for the correct level of analysis of social facts. This dissertation chooses to take the municipality level as a point of departure, as it has been shown that supportive communities are larger than the neighborhoods (Wellman & Gulia, 1999). A second reason is more pragmatic, as this choice makes it possible to investigate hundreds of municipalities within a country, instead of a limited amount of neighborhoods within a city. A second point of critique to community level studies is the ecological fallacy (Robinson, 1950), or the impossibility of drawing individual level conclusions from ecological analysis. Recent improvement in statistical techniques have made it possible to avoid this problem by separating community and individual level influences in multilevel analysis (Jones, 1991), and as such these will be used when possible. Some topics, such as suicide and crime rates, can only studied on the community level because individual level data are unavailable. To avoid ecological fallacy, conclusions on these topics only refer to community level processes, and no individual level interpretations

can be made. As neighboring municipalities can influence each other the appropriate spatial analysis techniques are advised (Anselin, 1988).

Well-being is a broader approach to measuring wealth, comprising a both objective and subjective indicators. Next to an individual level indicator such as subjective well-being, community level indicators such as crime and suicide rates can also be seen as important aspects of quality of life (Nussbaum & Sen, 1993). On the individual level extra attention is given to the impact of the goodness of others on one's subjective well-being (Nussbaum, 2001). On the community level, both crime levels and suicide rates are closely associated with the role of social relations in community well-being (Sampson, Morenoff & Gannon-Rowley, 2002; Helliwell, 2007). At the same time importance is given to the influence of concentrated deprivation (Wilson, 1987) and the role of the urban or rural character of a community.

1.4 Research questions

Departing from these theoretical perspectives, a number of research questions are addressed in the following chapters. Each chapter has previously been published in international peer-reviewed journals, and as such been thoroughly reviewed. Although the review process in itself has augmented the quality of each chapter, it has also affected each paper in an idiosyncratic way, depending on the remarks of the reviewers. To illustrate the coherence of each paper with the theoretical framework, the research questions are introduced with reference to the theoretical assumptions and perspectives mentioned, and state the main hypotheses in line of the theoretical expectations.

Chapter 2. The first research topic that is addressed relates to our explanatory variable of focus, social ties. We investigate to what extent the diversity of personal social networks is influenced by compositional and contextual factors, such as urbanity and population composition.

This research topic explores the relation between personal social networks and context, and partly addresses the community question. In contrast to Wellman (1979) the broader weak network will be investigated, as it has already been convincingly illustrated that personal support networks in the city exist (Wellman, 1979), and that they consist of a larger proportion of friends than family (Fischer, 1982). In a preliminary, unpublished analysis these findings have been replicated on the data I have used. This broader network of friends holds some challenges and some promises. In line with Granovetter (1973) I believe weak ties have their own strengths. They bring other social spheres closer to us in a direct manner, and provide us with real-life examples of people that differ more from us than our intimate circle. The aspect of weak ties I investigate, cross-cultural friendships, furthermore is of utmost importance in our diverse and multicultural society. While some state that diversity, on a macro level, is bad for society (Putnam, 2007), I tend to believe, in line with Allport (1954), that diverse contacts on the micro level foster more understanding and tolerance. Therefore already a descriptive and individual level analysis can be of relevance: which types of people tend to have a friend from a different ethnicity?
As the diversity of individual networks is investigated with multilevel techniques, it is possible to examine both compositional and contextual mechanisms. One would expect diverse places to foster diverse friendships. As our measure of ethnic network diversity does

not probe how many friends of a different ethnicity one has, but probes the presence of at least one, we expect relatively small community effects. Furthermore weak ties have been shown to be associated less with proximity than strong ties, especially in this age of globalization, so that in a sense weak ties are truly liberated from geography.

As such, our **first research question** is: Is the ethnic and religious diversity of one's weak friendship network influenced by the diversity of the context?

Chapter 3. The main outcome at the individual level is subjective well-being. I examine the importance of social relations for subjective well-being, and investigate if the community context has an influence

Individual subjective well-being is an important indicator of both psychological health and quality of life. The pursuit of happiness can hence be seen as an important motive, both in individual lives and as a government goal. In a contribution to this domain, the impact of social ties is investigated, as it relates to the notion that our well-being depends on the goodness of others (Nussbaum, 2001). The main mechanism responsible for the influence of social relations on subjective well-being is social support, often of an emotional and expressive nature (Berkman & Glass, 2000; House, 1981). Support functions as a buffer to stressful conditions and in this way maintains a person's well-being (Hobfoll et al., 1990). As this form of network resources are mainly, but not only, provided through close intimate ties (Lin, 1986), I expect that especially indicators of bonding networks, such as partnership and frequency of contact, influence subjective well-being. Since we want to control for spurious effects, psychological intermediate variables such as generalized trust and optimism will be included as controls. Attachment theory (Bowlby, 1969) posits that a partner relation is an essential prerequisite to venture out in the wider world. It is therefore reasonable to expect some interaction between having a partner and other variables.
Since context in the form of municipality of residence can be decisive for quality of life as well as psychological well-being, contextual influences are to be expected. More than urbanity in the sense of population density or population size, I believe the economic deprivation of a community will have an influence, as has been illustrated by earlier research (Clark & Oswald, 1994; Oswald, 1997).

Our **second research question** is: Is subjective well-being influenced by bonding social capital, and if so, is there any contextual influence?

Well-being is not limited to individual level analysis. Next to influences from the larger community context, communities in themselves can also be seen as having more or less well-being. In this PhD, two classical examples in the social sciences of social integration and the influence of context are re-examined.

Chapter 4. An ecological analysis of suicide rates on the municipality level, with specific attention for the social integration perspective and contagion.

In his seminal study Durkheim (1897/1983) wanted to illustrate that the most individual act one can think of, taking your own life, is influenced by the context in which you are embedded. Although this work was very influential in its time, contemporary social science rarely conducts analyses on suicide or suicidal behavior. From the epidemiological perspective, more and more attention is going to social and contextual factors, as is evident from the large literature on the negative consequences on mental health of social isolation (Seeman, 1996; De Silva et al., 2005). Therefore a community level analysis from a sociological perspective with municipality level data might give some more insight into the correlates and mechanisms of suicide in our time. What causes substantial differences in suicide rates in a region? Is urbanity still associated with higher suicide rates, or has the balance shifted in a negative way for rural areas? Attention will go to the both demographic and contextual explanation, at least for age and gender, as I will analyze age-specific suicide mortality rates. Furthermore, as there is the expectation that suicide is either contagious or has a geographically clustered higher regional acceptance, a spatial modeling approach is used to examine which theory is more applicable.

Our **third research question** is: Are suicide rates in a community influenced by the level of social integration?

Chapter 5. An ecological analysis of crime rates, focusing on the social correlates and the influence of deprivation.

A second classical example in social science of aggregate influences is the study of crime rates first conducted by the Chicago school from the social disorganization perspective (Shaw & McKay, 1942). Next to the obvious negative influence on well-being for an individual victim, higher crime rates have a broader negative influence on the well-being of residents of high crime areas. Instead of examining crime on a neighborhood level within one city, as is common, crime rates on the municipality level in a whole country are examined. This is a substantial and relatively unique approach to differences in crime rates which can shed a light on relatively understudied factors influencing crime. To avoid confusion violent crime is distinguished from property crime, as it can be expected that both forms are linked to community characteristics in a different way. As we do not have reliable information on the individual level of either victims or perpetrators, it will be difficult to distinguish compositional from contextual explanations. There are two extra points of attention in our analysis of crime rates. First of all the impact of deprivation will be investigated more thoroughly, as characteristics are often lumped together in a composite indicator, assuming the negative impact of all of the factors. Secondly, geographical patterns will be examined through spatial analysis. Are all forms of crime contagious between municipalities, or are there substantial differences?

Hence our **fourth research question**: What is the influence of social integration on crime rates?

Examining both crime and suicide will allow us to make an evaluation of the idea that they go hand in hand, and that they are caused by a shortage of respectively bridging and bonding ties. In the conclusions of this PhD dissertation, extra attention will be given to comparing the found associations in the larger theoretical framework, and assessing the possibilities and challenges for local municipalities in maintaining or augmenting community well-being.

Chapter 2

Do Diverse Geographical Contexts Lead to Diverse Friendship Networks?

A Multilevel Analysis of Belgian Survey Data

Abstract
The choice-constraint approach assumes that the choice of one's friends will be determined by both individual choices and the constraints imposed by one's interaction context. Trends toward homophily however, might counteract this effect if actors consistently seek interaction partners with the same background characteristics. In this study we investigate the impact of community level diversity on the cultural diversity of friendship networks. Based on a multilevel analysis of recent survey data from Flanders (Belgium), we demonstrate that community level diversity has a significant but limited impact on ethnic and religious friendship network diversity. Controlling for individual level characteristics, residents of ethnically diverse communities report more ethnically and religiously diverse friendships. The fact that ethnic and religious diversity overlap to such a large extent suggests that both divisions are closely related in contemporary secularized European societies.

This chapter is based on the following article:
Vanhoutte, B., & Hooghe, M. (forthcoming). Do diverse geographical contexts lead to diverse friendship networks? A multilevel analysis of Belgian survey data. *International Journal of Intercultural relations,* forthcoming.

2.1 Introduction

In the study of intercultural relations, personal networks are considered as crucially important. Allport's (1954) contact theory, the main framework of analysis for intergroup relations, states that equal status, common goals, intergroup cooperation and the support of authorities are crucial conditions for intergroup contact to reduce prejudice. In an influential reformulation of intergroup contact theory, Pettigrew (1998) added a fifth condition, largely comprising the previous four: the situation must allow the participants to develop friendship ties. Although positive effects also occur in absence of these conditions, they are significantly stronger when intergroup friendships are formed (Pettigrew & Tropp, 2006; Pettigrew, Tropp, Wagner, & Christ, 2011). The proximity of out-group members by itself, whether this occurs at the level of the community, the school or the work place, is a necessary but not a sufficient condition for social contact, as ethnic boundaries have a tendency to reproduce themselves in mixed environments (Festinger & Kelley, 1951; Scofield, 1991).

The influence of the proximity of diverse groups on personal intergroup relations therefore is a crucial mechanism to understand this process. In this article, we investigate the role of structural contact opportunities on the composition of personal social networks using multi-level analysis techniques. More precisely we investigate if and to what extent a diverse geographical context is associated with more ethnically and religiously diverse friendship networks.

The analysis will be performed using representative survey data from Flanders, the Northern region of Belgium (SCIF Survey 2009). A unique feature of this dataset is that it combines individual face-to-face survey data that were collected in 2009 (n=2,080) with aggregate real-life data on the local communities of the respondents (n=40). These data allow us to investigate the impact of community characteristics on individual networks in a reliable manner.

In this article, we first review the literature on the impact of context on social networks, diversity and friendship, before providing more information about data and methods. The results section is followed by a conclusion, highlighting the theoretical relevance of our findings.

2.1.1 Social ties and context

One of the general laws of social interaction is that birds of a feather flock together (Lazarsfeld & Merton, 1954). People with similar backgrounds, having similar lifestyles, with similar opinions, and in the same phase of the life cycle are more likely to develop common bonds than people who do not share these background characteristics. That similarity breeds connection, is an established fact in a number of life domains, and is labeled homophily (McPherson, Smith-Lovin, & Cook, 2001). Nonetheless, physical and geographical proximity is a first condition for contact. As Blau and Schwartz (1984) famously stated, you cannot marry an Eskimo if no Eskimo is around. A stronger presence in the direct proximity creates more possibilities for contact, and hence more opportunities to form relations (Pettigrew, 1998; Pettigrew & Tropp, 2006). The formation of personal networks in other words depends on structural constraints and opportunities (Blau, 1977; Fischer, 1982; Marsden, 1990; Kalmijn & Flap, 2001; Mollenhorst, 2009; Verbrugge, 1977). The choice-constraint approach emphasizes that individual choices with regard to the composition of one's personal network are constrained by the structural availability of potential network members (Blau, 1977). The composition of interaction contexts in this way partly determines the characteristics of one's personal network (Huckfeldt, 1983). The insights of the choice-constraint approach have been successfully applied in studies on the choice of dating and sexual partners (Laumann, Gagnon, Michael, & Michaels, 1994), marriage partners (Blau & Schwartz, 1984; Kalmijn & Flap, 2001), friendships (Mollenhorst, Völker & Flap, 2008), professional relationships (Flap, Bulder & Völker, 1998), relations among neighbors (Huckfeldt, 1983; Völker & Flap, 2007) and relations among school pupils (Baerveldt, Van Duijn, Vermeij & Van Hemert, 2004; Van Houtte & Stevens, 2009). The homogeneity induced by the interaction setting is conceptualized as baseline homophily, or the amount of diversity one can expect if individual relations would completely reflect context characteristics. Applying this logic, one can assume that this baseline homophily is smaller for minority groups, as they have more opportunities to interact with the majority.

2.1.2 Social ties and diversity

A second pathway to investigate homophily, next to the contextual level, is the choice or preference for similarity. This form of homophily, when people tend to choose people similar

to themselves from the pool of available contacts is called inbreeding homophily. Interpersonal relations are considered to be more rewarding if both parties share the same interests and attitudes (Huston & Levinger, 1978). From the social identity perspective, this preference for similar people is explained by the need to belong to a specific group, and to accentuate the differences with other groups (Tajfel & Turner, 1979). The presence of an out-group can be seen as a threat to the interests of one's own group, leading to a negative attitude towards the out-group (Blalock, 1967; Levine & Campbell, 1972). Next to perceived group conflict, socialization can also lead to similar negative attitudes towards out-group. Personality traits such as authoritarianism (Adorno, Frenkel-Brunswik, Levinson & Sanford, 1950) and close-mindedness (Rokeach, 1960) have as well been associated with out-group prejudice. A last explanation for in-group homophily outside of personal preferences is the peer pressure of groups, that can render the formation of heterogeneous ties more difficult (Granovetter, 1986). Hence, on the individual level it is clear that negative attitudes towards out-groups, together with group norms sanctioning intergroup ties, can limit the formation of intergroup connections (Ajzen & Fishbein, 1980). In a similar vein, it has been illustrated that the relation also works in the other direction. Diverse personal networks widen one's normative perspective, and prevent prejudice or hostile acts toward out-group members (Briggs, 2004; Pettigrew, 1998; Pettigrew & Tropp, 2006; Putnam, 2000).

An important aspect in this regard is which markers of group boundaries are salient. Group boundaries can be based both on socio-demographic dimensions, such as race, ethnicity, religion, status, sex or age, as on more value based forms, such as opinions, and tastes. Culturally diverse networks are defined as linkages between identity based, culturally defined and ascribed group differences such as ethnicity, sexual preference, religion, gender and age (Wuthnow, 2002). This type of diversity is the focus of this study. Socio-economic diversity on the other hand is associated with the stratification of society and status differences, and has been the object of most research on homophily from a network perspective (Lin & Erickson, 2005). Network diversity of this type is mainly associated with more instrumental and material goals, and it is not necessarily linked to tolerance or a reduction of prejudice.

It is firmly established that ethnicity is one of the strongest contemporary group boundaries (McPherson et al., 2001, Baerveldt et al., 2007). In recent decades, immigration flows have turned Europe into an increasingly ethnically diverse society (Hooghe, Trappers, Meuleman, & Reeskens, 2008). In Belgium, one of the smaller member states of the European Union, non-nationals make up about 10% of the population. Ethnicity can be seen as an ascribed categorization based on both phenotypical and socio-historical characteristics (Bader, 2007).

Studies suggest that the perception of ethnic out-groups is mainly determined by the idea of common descent or culture (Zagefka, 2009). For the Belgian context, this implies that mainly non-Europeans will be seen as an ethnically defined out-group (Baerveldt et al., 2007; Van Acker & Vanbeselaere, 2011). Citizens from neighboring European countries, like the Netherlands or France, are not perceived as ethnically different by a majority of the original Belgian population.

Religion has been shown to be the second strongest group boundary marker, after ethnicity, despite the fact that its significance is diminishing (Kalmijn, 1998; McPherson et al., 2001). The majority of studies on religion and diversity focus on differences between Protestants, Catholics and Jews in religiously heterogeneous countries (Kalmijn, 1998). Belgium, however, traditionally was dominated by Catholicism, with a very limited presence of Jewish, Protestant or Anglican minorities (Botterman & Hooghe, forthcoming). As is the case in other countries in Western Europe, the influx of immigrants with an Islamic background during recent decades, have led to a renewed salience of religious cleavages, as concern about Islam as a social and political force has become more prevalent in Belgian society (Strabac & Listhaug, 2008). Religious diversity in Belgium, in practice therefore refers to the division between the original majority population (with a Christian tradition but heavily secularized) and (descendants of) immigrants with an Islamic background. Estimates are that Islam accounts for slightly less than five per cent of all inhabitants of Belgium (Husson, 2007).

Cultural diversity thus can be defined both in terms of ethnicity (place of birth or citizenship status) and religion (Europeans with a Christian or humanistic tradition versus non-Europeans with an Islamic background). Given the specific demographic situation of Belgium we expect that both divisions largely overlap.

2.1.3 Friendship ties

Not all social relations are of equal value however. Family or one's partner can be seen as primary, very important ties, while neighbors, co-workers and acquaintances can be considered as less intensive, more superficial relations. Therefore social relations are usually classified in terms of tie strength, which is a combination of the amount of time, the emotional intensity, the intimacy and reciprocal services that characterize the tie (Granovetter, 1973). Adult friendship ties, the object of our study, take an intermediate position in terms of tie strength (Mollenhorst, 2009; Verbrugghe, 1977). They are both pervasive and active,

compared to neighbor and co-worker ties, and they involve frequent face-to-face contact and positive affect (Verbrugghe, 1977). Friendship ties are important sources of emotional aid, companionship and assistance (Wellman & Wortley, 1990), and they are ranked high among the things that matter most in life (Klinger, 1977).

Given the importance and the strength of friendship ties, there is all the more reason to suppose they will be characterized by homophily. As Granovetter (1983, p.220) expressed it: "Homophilous ties are more likely to be strong". It can be assumed, therefore, that the more intensive the tie strength is, the more likely it is that network members will have the same background characteristics (Burt, Marsden, & Rossi, 1985; Marsden, 1986; Marsden, 1988).

At the same time, it has to be noted that 'friend' as such is a problematic notion for analysis, as it is not well-defined. As Fischer (1982, p.288) points out, it is nevertheless a notion that cannot be abandoned by social science because it has an imprecise definition, because it is a basic folk concept actors use to order there world, and at the same time is part of the scientific intellectual apparatus. This has led Krackhardt (1992) to the development of the notion 'filos', to denote a close friend, with whom one interacts, towards whom one has affection, and with whom the relationship has already existed for some time. Other, more distant friends can nonetheless still be important sources of information (Burt, 1992) or benign interaction with diverse others (Pettigrew, 1998).

The definition of 'friend' therefore relies heavily on the measurement instruments used. Measurement with name generators and investigating social support (see e.g. Krackhardt 1992; Baerveldt 2004) focus on close core relationships, that are easily identifiable. Although there have been notable forms of measuring active, wider networks through name generator studies (see e.g. Roberts, Duncan, Pollet & Kuppens, 2009), most studies on weak ties use an indirect approach, pioneered in the domain of socio-economic network diversity (Lin & Dumin, 1986; Erickson, 1996). Instruments such as the position generator (Lin & Dumin, 1986) ask the respondent if s/he knows someone having the listed occupations. By asking the respondent about a number of occupations, key information of a respondent's weak network, such as the socio-economic scope of the network, can be calculated. A recent instrument by Van der Gaag, Snijders and Flap (2005) mimicked this approach, but instead of looking at access to positions, access to various resources is examined.

In a similar manner, in this study we measured diversity in weak ties, by asking about a number of categories of diversity. In the current analysis, two related forms of diversity in the wider friendship network are analyzed. As our measurement instrument probes for diversity in weak ties, we can expect less homophily than in previous studies on friendship networks.

2.1.4 The impact of cultural diversity on friendship ties

In summary, there is a vast array of empirical research on the cultural diversity of friendship networks, highlighting both individual level and community level determinants of diversity. On the individual level, it has been shown that younger people have more diverse networks (Briggs, 2007; Marsden, 1987). This can be explained by the increased structural availability of diverse 'others' among younger groups, and lower levels of ethnocentrism among younger age cohorts (Feld, 1981; Feld, 1982). It has also been suggested that the networks of older people are dominated more strongly by family members and kin, and self-evidently this too limits the degree of diversity within the network (Marsden, 1987). Due to different locations in the social sphere, and networks generally more oriented towards friends than kin, men have higher levels of network diversity than women (Moore, 1990). Higher educated actors tend to have more diverse friendship networks, and their levels of prejudice also tend to be lower (Wagner & Zick, 2006). Research in the U.S. nonetheless reports this is not the case for ethnic diversity (Marsden, 1987). With regard to ethnic diversity, nonreligious persons are more likely to have diverse friendship networks (Briggs, 2007), which can be explained by a higher level of open-mindedness (Rokeach, 1960) and lower levels of prejudice against out-groups (Allport & Ross, 1967).

On the community level, it is expected that more diverse communities will lead to more diverse networks, as more opportunities for intergroup contact are present (Pettigrew, 1998). From Blau's (1977) theory on structural constraints, it can be deduced that members of ethnic or religious minority groups have a higher likelihood of meeting someone from a different ethnic group in comparison with members of the majority group (Marsden, 1988).

Within the literature, however, there is no consensus on what kind of geographical context exactly should be taken into consideration when studying friendship networks in the general population. Friendships do not stop at the end of the neighborhood, but the bulk of social contacts live close by (Fischer, 1982). Studies that explicitly model networks in neighborhoods show that neighborhood networks do remain important, even in contemporary societies (Völker & Flap, 2007). The intensity of contact in a friendship relation is markedly higher if the contact lives within approximately 10 kilometers distance (Carrasco, Miller, & Wellman, 2008; Mok, Wellman, & Basu, 2007). It can be assumed therefore, that the population composition of that area will also be related to the characteristics of one's personal network. In the current study, geographical context is operationalized as the municipality of residence. In the Flemish region of Belgium, the average surface of a municipality is 44

square kilometer, or roughly a diameter of seven kilometer, which corresponds to the distance for friendship contact determined by using detailed GIS data (Carrasco, Miller, & Wellman, 2008; Mok, Wellman, & Basu, 2007). Therefore it can be assumed that the municipality is an adequate level to investigate the influence of community structure on friendship networks. An additional reason to use this level is the availability of administrative population statistics on this level.

This overview of the literature leads to two hypotheses that will guide us through the further analysis:

H1: Controlling for composition effects, both ethnic and religious network diversity will be higher in more diverse communities.

H2: Cultural network diversity will be higher among the younger, men, higher educated, and ethnic and religious minorities.

2.2 Data and methods

2.2.1 Sample

Since these hypotheses are ideally tested within a general population survey, a complete network design is impossible. Earlier research, however, has indicated that egocentric network measures in surveys can provide robust and representative information (Marsden, 1990). Egocentric network studies assemble data from a focal actor about the actor itself and about others to whom the focal actor is linked, rendering it possible to examine population samples (Marsden, 2005). These studies normally do not collect information from the other network members. The first study that included egocentric network measures was the 1985 U.S. General Social Survey (Burt, 1984), and this survey yielded numerous new insights on the extent, composition and structure of networks of U.S. citizens (Marsden, 1987; Marsden, 1988; McPherson, Smith-Lovin, & Brashears, 2006). The current study too relies on a general population survey, the Social Cohesion Indicators Flanders (SCIF) Survey. The SCIF survey is a representative survey of 2,080 respondents between 18 and 85 years old, conducted between April and July 2009 in the Northern autonomous region of Flanders, which has 6,162,000 inhabitants or 58 percent of the total Belgian population. A face-to-face interview methodology was chosen since this method allows longer interviews and leads to more reliable answers on complicated measurement instruments. A drawback of this interview method is that respondents might be induced to give more socially conform answers. A total of 103 experienced interviewers were given an introductory training session by one of the researchers of the project, and they conducted the interviews at the respondent's home using computer assisted interviewing. During the interviewer training, attention was focused on strategies to reduce the effect of social desirability. The average duration of an interview was on average about an hour.

The survey was designed specifically to analyze the impact of community level characteristics on individual outcomes. To select the respondents, two-stage cluster sampling was used. First, groups of municipalities, differing minimally within and maximally between groups, were identified through cluster analysis. The Flemish region is divided in 308 municipalities, with on average ca. 20,000 inhabitants and a surface of 44 km². This analysis was performed using

community level indicators of population density and mobility, industrial production, economic performance and demographic indicators. From the resulting clusters, 40 municipalities were randomly drawn, with their selection chances dependent on their population figure. This procedure was used to ensure sufficient variation of relevant indicators on the community level. A detailed description of this step is included in the appendix. In a second phase, a simple random sample of inhabitants living in the selected municipalities was drawn from the official national registry (including both Belgian citizens and foreign nationals). Overall, the survey obtained a response rate of 54 per cent, which can be considered as average for this kind of research in a Belgian context. A response analysis indicated that respondents are representative for the population, with no significant differences between participants and the population with regard to age and gender. The resulting dataset includes information on 2,080 respondents, nested in 40 distinct municipalities. This nested design allows us to test the impact of community level variables on individual outcomes in a methodologically correct manner, with sufficient cases both on the first (individual) and second (community) observation level.

2.2.2 Network diversity

The dependent variable in this analysis is network diversity. We measured the diversity of the respondent's friendship network in terms of religious denomination, ethnic background, sexual orientation, generation and political ideology. Earlier studies have shown that this kind of direct measurement of friendship network diversity might overestimate diversity, but that it is reliable if one wants to analyze structural determinants of friendship networks (Smith, 1999). Furthermore, this question allows for a better measurement of diversity of weak ties, as described earlier. In this survey, the question about friendship network diversity was preceded by a question on the number of close friends, defined as friends with whom one can talk about personal matters.

The question used to tap friendship network diversity is similar to the one used in the 2000 Social Capital Community Benchmark Survey in the United States (Putnam, 2007). The exact question wording was:

"Think about your friends (and not only your best friends). Do you have a friend…"

With a different religious orientation?

With a different ethnic background?

With a different sexual orientation?

Of a different generation (at least 20 years of difference)?

With different political ideas?

The respondents were asked to answer with a simple yes or no. Respondents were not asked any additional information on the number of friends with these characteristics, as we do not have any information on the total number of friends included in the network.

To provide an overview of the variation by gender and by educational level in the diversity of friends, the proportion of respondents answering yes on each item is presented in Table 2.1. It can be noticed that friendship networks in Belgium tend to be quite diverse, at least with regard to some indicators like political ideas. Differences between both genders are rather small, with men usually having a slightly more diverse network, with the exception of sexual orientation, which is in line with the literature on homophobia (Hooghe, 2011). The differences between different education levels are more substantial, with higher educated respondents reporting a more diverse network.

Table 2.1 Diversity of the Friendship Network, According to Gender and Education Level

	Gender		Educational level			All
	Male	Female	Lower secondary	Finished secondary	Higher education	
People with a different religious denomination	45.4	41.3	30.6	43.7	53.7	43.26
People with a different ethnic background	41.3	35.0	28.5	40.2	43.5	38.04
People with a different sexual orientation	43.3	46.1	26.5	49.2	55.8	44.74
People of a different generation (at least 20 years of difference)	55.1	50.6	43.1	53.5	61.1	52.77
People with different political ideas	75.7	69.0	52.3	73.1	88.4	72.26

Note. N=2,051. Entries are percentage of respondents indicating they have friends with different characteristics.
Source: SCIF 2009.

The questionnaire thus includes information on five different kinds of cultural network diversity. For the current analysis only the items most related to cultural diversity in Belgium, namely ethnic and religious diversity, will be taken into account. Ethnic diversity in this regard is mainly interpreted as the presence of nationals from a non-European descent. Religious diversity in the Belgian context can be seen as a closely related measure, since this mainly refers to Islam, a religion that was virtually absent in Belgium until the 1950s. Although ethnic and religious diversity in friendship networks are the least prevalent forms of diversity, the percentages in our study are significantly higher than those reported in other population studies on network diversity, where ten percent of friendship relations is with ethnically different out-groups (Marsden, 1987). This is related to the fact that a different measurement instrument is used, and as such not the proportion of diverse relations on total relations is reported, but the proportion of the sample that has at least one ethnically or religiously different friend in the wider network. It can be assumed therefore that if we would have information about the total network, diversity measures indeed would be lower. In practice, however, it is impossible to collect such comprehensive network measurement in a general population survey.

2.2.3 Community level variables

The ethnic diversity of local communities is measured using the rate of non-European nationals residing in a municipality per 1000 inhabitants. This measure has been proven to be a valid proxy for the total level of ethnic diversity in a municipality, including foreigners that have acquired Belgian citizenship (Botterman, Hooghe & Reeskens, 2011). Since reliable measures of religious diversity are not available, we will use the proportion of non-European nationals as a measure for community level religious diversity. This is acceptable since, as outlined earlier, ethnic and religious minorities are mainly non-European immigrants and their descendents in the Belgian context.

An overview of the municipality level indicator used is presented in Table 2.2.

Table 2.2 Frequencies and Descriptive Statistics of Municipality-level Variables

	Missing	Mean	Std. Dev.	Minimum	Maximum
Non European inhabitants/1000 inhabitants (2008)	0	12.77	13.72	1.37	69.60

Note. N=40. Source: Directorate General Statistics and Economic Information, Federal Government of Belgium

2.2.4 Individual level variables

Although our main theoretical interest is the influence of the community level, we include a number of control variables on the individual level. As a measure for ethnic origin, we look at the nationality of the parents of the respondent. If at least one parent does not have the Belgian nationality, we consider the respondent as being from a non-Belgian origin. We use this indicator since a significant part of ethnic minority group members in Belgium has acquired Belgian citizenship status. We also include religious denomination. Here we make a distinction between Roman Catholics, non religious respondents and followers of other religions, mainly consisting of Muslims. Furthermore, we control for age, gender, educational level, living with a partner and occupational status. The descriptive statistics of all individual level variables are presented in Table 2.3.

Table 2.3 Frequencies and Descriptive Statistics of Individual-level Variables

Variable	Missing	Mean or Percentage	Std. Dev.	Minimum	Maximum
Age	0	47.19	17.94	17	84
Gender (0=men; 1=women)	0	52%	0.50	0	1
Educational level					
Lower secondary	0	28%	0.45	0	1
Secondary education	0	40%	0.49	0	1
Higher education	0	31%	0.46	0	1
Living with Partner (0= Not living with partner; 1=Living with partner)	0	68%	0.47	0	1
Occupational Status					
Employed	2	54%	0.50	0	1
Unemployed	2	13%	0.34	0	1
Student	2	8%	0.43	0	1
Retired	2	25%	0.27	0	1
Nationality parents (0=at least one parent non-Belgian; 1= Both parents Belgian)	4	88%	0.32	0	1
Religious denomination					
Roman Catholic	0	75%	0.44	0	1
Other Religion	0	6%	0.23	0	1
Not religious	0	19%	0.40	0	1

Note. N=2080, Source: SCIF Survey 2009.

2.2.5 Multilevel analysis

As the main research question relates to the impact of geographical context, multilevel methods of analysis are called for. Multilevel analysis, also named hierarchical linear modeling or random effect models, renders it possible to make a distinction between individual level, composition and context effects, by separating the total variance in individual level and higher level variance (Snijders & Bosker, 1999). Starting from a null model, containing only a constant, we add information step by step, first on the individual level and subsequently on the community level. The null model allows us to assess the level of intra-class correlation. Comparing the model with individual information with the null model informs us how much of the variance on the municipality level can be explained by the composition of that municipality. The final model, containing individual as well as municipality level information tells us which aspect of the context is most important in explaining differences between municipalities, taking into account individual level information. These three steps are followed for the analyses of each item. A likelihood ratio test is used to see if the new model is an improvement in terms of fit in comparison with the last model. To give an indicator of the model fit, McFadden's pseudo R squared measure, based on the log likelihood, is calculated. Note that as we are conducting a multilevel model, and working with dichotomous dependants, R squared measures should be interpreted with caution (Hosmer & Lemeshow, 2000).

In this analysis the dependent variables, ethnic and religious diversity of the network, are dichotomous, and therefore a logistic model such as logit or probit is preferred. To facilitate interpretation, multilevel probit models are used. Coefficients in probit models have a similar interpretation as OLS regression coefficients: the size of an effect is reflected in the absolute value of a coefficient, with zero indicating no effect. Negative coefficients signify a negative relation between the dependant and the independent, while positive coefficients illustrate a positive association.

2.3 Analysis and results

Table 2.4 lists the results of the analysis. In order to facilitate the comparison between ethnic and religious diversity in friendship networks, each step of the multilevel analysis is presented side by side. In the first, so-called null model, it can be observed that both for ethnic and religious network diversity, slightly less than eight percent of the total variance can be attributed to the community level. This indicates that characteristics of the community one lives in are related to the composition of friendship network. This confirms that we indeed need a multilevel analysis to arrive at reliable results. While at first sight eight per cent might not be that impressive, it does suggest that there is at least some effect of the community on the composition of friendship networks.

Model I includes the individual level variables, and this allows us to explain almost half of the variation on the community level. This means that a substantial part of the variation on this level is due to the composition of each community, as not every community has the same composition with regard these background characteristics. Individual level information already explains nine percent of the total variance. In Model I it can be observed that for both ethnic and religious diversity educational level and religious affiliation play an important role. Higher education is associated with more diverse networks, and adhering to a different religion than the dominant one, or not being religious at all, increases the probability of a diverse network. Members of ethnic minorities have more diverse networks, since they are more likely to encounter members of the majority group. Students tend to have more diverse networks than employed, unemployed or retired respondents. An important point of difference between the two forms of cultural diversity is that the friendship network of older or female respondents tends to be less ethnically diverse, while age and gender do not play a role for religious diversity. The relation does, however, run in the same direction but it fails to reach significance. Most of these individual level relations confirm the results of earlier research.

In Model II, we add the proportion of non European-inhabitants in a community. This variable explains most of the remaining variation on the community level. Consequently, individual network diversity is not only explained by individual characteristics and compositional effects, but also by context effects on the municipality level. This means that apart from what we could expect based on the individual characteristics of the inhabitants, there is an additional effect of living in a diverse community. These results confirm our first hypothesis that there is more diversity in friendship networks in more heterogeneous

communities. Despite the trend toward homophily, the presence of ethnic minorities within one's communities therefore is associated with higher levels of intercultural friendships. Furthermore it can be observed that the coefficients for ethnic and religious diversity are almost identical, lending support to our assumption that in contemporary Western European societies, religious diversity is indeed closely related to ethnic diversity.

Table 2.4 Multilevel Analysis of Ethnic and Religious Diversity of the Friendship Network

		Model 0		Model I		Model II	
		Ethnic diversity	Religious diversity	Ethnic diversity	Religious diversity	Ethnic diversity	Religious diversity
		B (SE) Sig.	B (SE) Sig.	B (SE) Sig.	B (SE) Sig.	B (SE) Sig.	B (SE) Sig.
	Constant	-.348 (.055) ***	-.202 (.055) ***	.842 (.169) ***	.511 (.170) ***	1.807 (.217) ***	1.517 (.213) ***
Individual level	Gender (Ref. Male)			-.167 (.061) **	-.111 (.060) ns	-.167 (.061) **	-.110 (.060) ns
	Age (in years)			-.014 (.003) ***	-.006 (.003) ns	-.014 (.003) ***	-.006 (.003) ns
	Educational level (Ref. finished secondary)						
	Lower secondary education			-.205 (.079) **	-.318 (.078) ***	-.197 (.079) *	-.310 (.078) ***
	Higher education			.173 (.071) *	.344 (.071) ***	.179 (.071) *	.333 (.070) ***
	Living with Partner (Ref.: No)			-.114 (.070) ns	-.122 (.070) ns	-.112 (.070) ns	-.113 (.069) ns
	Occupational Status (Ref.: Employed)						
	Student			.272 (.136) *	.355 (.137) **	.276 (.135) *	.352 (.136) *
	Retired			-.012 (.111) ns	-.031 (.110) ns	-.016 (.111) ns	-.044 (.109) ns
	Unemployed			.023 (.100) ns	.034 (.100) ns	.011 (.100) ns	.023 (.099) ns
	Religious affiliation (Ref.: Roman Catholic)						
	Other Religion			.696 (.151) ***	.954 (.163) ***	.635 (.150) ***	.891 (.161) ***
	No religion			.213 (.095) *	.391 (.095) ***	.193 (.094) *	.374 (.094) ***
	Parents Belgian Nationality (Ref. No)			-.547 (.103) ***	-.509 (.105) ***	-.504 (.102) ***	-.469 (.104) ***
Community level	Non European inhabitants/1000 inhabitants (2008) (ln)					.209 (.032) ***	.218 (.031) ***
ICC		.077	.078	.044	.043	.003	.002
Log likelihood		-1347.349	-1371.332	-1219.278	-1247.847	-1204.723	-1232.128
Likelihood ratio test		/	/	256.14 ***	246.97 ***	29.11 ***	31.44 ***
Pseudo-R^2		0	0	.0951	.0900	.1059	.1015

Note. N=2070 (Ethnic diversity) N=2051 (Religious diversity), Data: SCIF-survey 2009. ns: p>=.05; *: p<.05; **: p<.01; ***: p<.001. Entries are the results of a random intercept multilevel probit regression model, using the probit command in Stata (Rabe-Hesketh & Skrondal, 2005).

2.4 Discussion

The aim of this study was to provide insights on the community level determinants of cultural diversity in wider friendship networks. We departed from the notion that not only personal preferences, but also contextual constraints influence the structure of personal social networks. First stated by Blau (1977), this hypothesis received confirmation throughout this study. A first confirmation comes from the substantially higher degree of cultural diversity in the networks of descendents of non-Belgians. Since these respondents belong to an ethnic minority group, they are very likely to have friends with a different ethnic background. The same argument is valid for other smaller groups, such as those having a different religious denomination. The substantial composition effect provides a second indicator for the choice-constraint approach: a significant part of the variation on the context level can be explained by including information about the composition of the sample in every municipality. The higher level of friendship diversity can be partly explained by the presence of more respondents who adhere to a different or no religion, or of who the parents are not of Belgian descent. A third way in which the main hypothesis is confirmed is by the association of diversity on the context level with the diversity of the friendship network. In municipalities with a strong ethnic diversity, respondents report more diverse friendship networks than we can expect based on individual information. While previous research indicates clearly that homophily occurs in friendship networks, the current study to some extent counterbalances this finding. Despite the tendency toward homophily, it is clear that the 'supply' of diversity in one's geographical context influences the diversity in one's friendship network. As a limitation it has to be noted that, as this study was based on cross-sectional and not longitudinal data, it is possible that the causal pathway runs in the opposite way: people with more diverse networks or more open to diverse contacts, live in more diverse cities. In this case, diverse friendship networks are not formed due to more opportunities for intergroup contact, but individuals with culturally diverse networks choose to live in more heterogeneous communities.

On the individual level, as expected, higher educated, students, those who adhere to no religion or to a minority denomination, and respondents from a non-Belgian descent have more diverse networks. While most associations found were similar for ethnic and cultural diversity, men and younger respondents had slightly more ethnically diverse networks than women, while gender and age did not have an influence on religious diversity. An obvious remark is that the clearly more diverse networks of students, controlling for educational level

and age, illustrates a possible danger in generalizing findings based on university student or school pupil samples to the general population.

The context level under investigation in this study was the community of residence. Although the variation on this level of friendship network diversity was limited, it was not negligible. In addition a relatively low threshold for diversity, having at least one friend with a different ethnic or religious background, was investigated. In addition, weak friendship ties were investigated, and these are expected to be both less influenced by local proximity and less homogenous (Granovetter, 1983). Therefore it is remarkable that in times of globalization, in a densely populated and small region such as Flanders, local communities still play a significant role in the development of weak friendship ties. Although the effect of the community level remained rather limited, with a total intra class correlation of slightly less than eight per cent, it has to be noticed that diverse communities are associated with at least some form of diversity in friendship networks. It is recommended that in future research, more attention is paid to the gradient between baseline homophily and inbreeding homophily, which could not be done in this study due to the measurement instrument used. More detailed investigation of the network diversity of minority respondents could also yield substantial insights, which was not possible in this study due to sample constraints.

Chapter 3

Subjective Well-Being and Social Capital in Belgian Communities. The Impact of Community Characteristics on Subjective Well-Being Indicators in Belgium.

Abstract
In this article, we investigate the effect of individual and community level characteristics on subjective well-being in Belgium. Various indicators for subjective well-being are being used in a multilevel analysis of the 2009 SCIF survey (n=2,080) and the 2006 Belgian ESS sample (n=1,798). On the individual level, most hypotheses on the determinants of subjective well-being were confirmed. Living with a partner and age were shown to have strong effects, but also social capital indicators had a significant positive effect on subjective well-being. All these effects remained significant controlling for optimism. On the community level, especially unemployment rate had a negative impact on subjective well-being. The analysis further demonstrates that in homogeneous regions, community characteristics have a far weaker impact on subjective well-being indicators than in economically more heterogeneous regions.

This chapter is based on the following article:
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3.1 Introduction

While it can be safely assumed that subjective well-being is determined mainly by individual characteristics (DeNeve & Cooper, 1998), research has also confirmed the impact of community characteristics on well-being (Farrell, Aubry, & Coulombe, 2004). The expectation is that specific features of communities or neighborhoods will have an impact on the quality of life of citizens, even controlling for individual background characteristics (Rahn & Yoon, 2009). Recent comparative research suggests that the context of an individual accounts for a substantive part of his or her happiness level (Frey & Stutzer 2000, 2002; Helliwell, 2003; Helliwell & Putnam, 2004). Societies show strong and persistent differences with regard to their average level of subjective well-being and it is a reasonable expectation that these differences cannot be attributed exclusively to individual psychological differences (Diener, Oishi, & Lucas, 2003; Christoph & Noll, 2003). Less is known, however, about which specific community characteristics could have an impact on subjective well-being. Since most of the currently available studies tend to focus on explaining differences between countries, relatively little attention has been given to the neighborhood or community level (Helliwell, 2003). Of the studies that are available on the community level, most are based in the US (Fernandez & Kulik, 1981; Subramanian, Kim, & Kawachi, 2005) and we have access to few studies from a European context.

In this article we report on the distribution of subjective well-being in Belgian communities. The Belgian case is theoretically relevant because, together with the Scandinavian countries, Belgium is one of the countries in the world with the lowest level of income inequality (OECD 2009). While previously it has been demonstrated that community characteristics matter in highly unequal and/or segregated societies, it remains to be ascertained whether community effects can also be detected in more equal and less segregated societies like Belgium. To answer this research question, we will rely on two different datasets. The first one, *Social Cohesion Indicators in Flanders (SCIF),* has as main advantage that it includes a full battery of questions on subjective well-being and this allows us to cover various dimensions of well-being. The disadvantage, however, is that it only contains data on the Northern and economically rather homogeneous region of Flanders. The Belgian sample of the European Social Survey-2006, on the other hand offers a less extensive measurement of subjective well-being, but it includes the entire country, thus offering more variance in both

the independent individual and community level variables. The combination of both datasets, therefore, allows us to solve our research questions in a comprehensive manner.

3.2 Subjective well-being

In recent years, subjective well-being has received increasing attention within social sciences in general and more specifically within community studies (Noll, 2002; Helliwell, 2003). Subjective well-being is usually considered as "a broad category of phenomena that include people's emotional responses, domain satisfactions and global judgments of life satisfaction" (Diener, Suh, Lucas, & Smith, 1999, 277). While positive or negative affects, such as moods and emotions, can be regarded as short-term indicators of subjective well-being, satisfaction with life or with specific domains of life reflects a more cognitive and long term evaluation (Lucas, Diener, & Suh, 1996). Increasing life satisfaction or subjective well-being can be regarded as a paramount striving throughout human history. On a collective level, democratic political systems ideally try to achieve the highest level of life satisfaction for most citizens. On an individual level, people achieve happiness or satisfaction through self realization on a number of life domains, such as work, family, social life, etc. This means that well-being depends not only on individual abilities, or social position, but that it is also dependent on the context, on the 'goodness of others', as Nussbaum (2001) phrased it.

Previous research has demonstrated that well-being data can be used to compare the quality of life between countries. Subjective well-being therefore can be used as an indicator to monitor policies aimed at improving well-being at a national level (Diener, 2000; Helliwell, 2003). Although historical, religious and cultural differences play an important role in the explanations offered, a significant share of the observed cross-cultural differences can be explained in terms of socio-demographics, community integration and material wealth, although some recent studies have also questioned the cross-cultural measurement equivalence of these scales (Eckersley, 2009).

Not just the national level has been investigated with regard to variations in well-being, but also the local or community level. Some studies find significant differences between communities and regions *within* a country, as is the case in Switzerland (Frey & Stutzer, 2000; Frey & Stutzer, 2002), Italy (Rampichini & Schifini d'Andrea, 1998) or the US

(Fernandez & Kulik, 1981; Bjørnskov, 2008). Frey and Stutzer (2000), e.g., demonstrate that the presence of procedures for direct democracy and the degree of decentralization of political institutions have a positive impact on the subjective well-being of residents. Not all studies, however, confirm these local differences. For the United Kingdom, Duncan et al. (1995) did not discover any significant community differences with regard to mental health, controlled for composition of the population in those communities. Research in the United States (Plaut, Markus, & Lachman, 2002), too, fails to reveal significant community determinants for general life satisfaction.

While previous research has shown strong inter-state and regional variations with regard to happiness (Bjørnskov, 2008), countries appear to be more homogeneous with regard to general life satisfaction (Plaut, Markus, & Lachman, 2002; Cummins, 1995). This might imply that life satisfaction is partly dependent on cultural mechanisms, and we can assume these cultural traits to be present throughout society, no matter what the specific community characteristics might be. Life satisfaction apparently is not just a mechanical sum scale, summarizing one's self-realization in various life domains. It can be considered as part of a cultural process of interpretation and giving meaning to one's life, and we can assume that this process is present throughout society without too much local variation within that society. Individualism, the quintessential feature of the American value system (Bellah et al., 1985), implies that realizing one's well-being is a personal responsibility, since everyone is responsible for his/her own happiness (Suh, 2000). Admitting in a survey that one is not satisfied with life in an individualistic culture implies that one has not been able to maximize his/her opportunities, talents and capabilities. Within these cultures one can therefore observe a strong social pressure to evaluate life satisfaction in a positive manner. Comparative research convincingly illustrates that individualism is a substantial part of the explanation of subjective well-being (Diener, Diener, & Diener, 1995). There is some disagreement in the literature, however, on the precise causal mechanism to explain the positive relation between individualism and subjective well-being. Inglehart (1997) and others have noted that a cultural climate of individualism creates more opportunities for self-realization, thus enhancing the satisfaction with life among the citizens of these communities.

The current state of the literature, therefore, leads to a number of clear research questions. While local communities apparently have an impact on happiness levels, this is not necessarily the case for subjective well-being. Subjective well-being indicators are strongly influenced by national-level determinants (culture, income level, ...) but it remains to be

investigated what kind of community levels can have an impact on subjective well-being. In this article, we therefore will investigate the impact of community level characteristics on subjective well-being, controlling for individual level determinants and for composition effects.

3.3 Determinants of subjective well-being

Given the current literature, it can be expected that both individual characteristics and community level characteristics will have an impact on subjective well-being. These determinants will be briefly reviewed in this section. We start with individual level determinants.

3.3.1 Age, gender and family structure

In most studies on subjective well-being, gender does not play a significant role. Age on the other hand seems to have a curvilinear effect: both the youngest and oldest age groups have a significantly higher level of well-being with the lowest levels being recorded among the middle age group (Clark & Oswald, 1994; Blanchflower & Oswald, 2007). Research shows that being married contributes significantly to the level of subjective well-being while being divorced, widowed or separated have an equally clear negative impact (Lucas, Clark, Georgellis, & Diener, 2003; Clark & Oswald, 1994). Having children, too, seems to have a negative impact on one's level of well-being (Clark & Oswald 1994). Few studies, however, investigate in a systematic manner the interaction effects between these variables.

3.3.2 Material conditions

Looking at the correlates between material conditions and subjective well-being, one can discern two related patterns. On the one hand, income is certainly positively related to subjective well-being, but more recent research shows that material well-being has only a modest effect on subjective well-being (Diener & Oishi, 2000; Diener & Biswas-Diener, 2002). Furthermore it seems that the relative income level, or the comparison between one's

own income and the national average income, has a stronger effect on subjective well-being than the absolute income level (Easterlin, 1974, 1995). Furthermore, being unemployed is a strong determinant for a lower level of well-being. The negative effect of unemployment by far surpasses the effect of income loss (Clark & Oswald, 1994; Di Tella, MacCulloch, & Oswald, 2001; Frey & Stutzer, 2000; Oswald, 1997; Kahneman & Krueger, 2006). These findings illustrate that being employed is much more than just earning an income, it can be seen a fundamental part of the self-realization that is the key to subjective well-being.

3.3.3 Social capital

Social capital, as it is used frequently in contemporary social science, refers to the impact of networks on society and individuals (Putnam, 1993, 2000). Apart from having a direct influence on the people included in networks themselves, social networks also have an indirect impact on society in general (Helliwell & Putnam, 2004). Both formal networks, through jobs and participation in organizations, and informal networks between friends and neighbors, are supposed to have a positive influence on community life. Next to these more structural features of social capital, the concept contains a more attitudinal component as well: generalized trust. This can be conceptualized as the degree to which one believes people are trustworthy in general, and this attitude has been shown to be cross-culturally equivalent (Reeskens & Hooghe, 2008). It is expected that social capital, operationalized either through measures of the degree of participation in formal and informal networks or through trust in others, will have a positive influence on subjective well-being (Helliwell & Putnam, 2004). Although research on the relation between social capital and subjective well-being is quite scarce, the idea that inclusion in society and social support matters is well documented in research on well-being (Helliwell & Putnam, 2004; Winkelmann, 2009).

3.3.4 Personality structure

It is important to point out that happiness, or life satisfaction, cannot be reduced to a personality trait, as has been convincingly illustrated by Veenhoven (1994). Taking personality traits into account, however, allows for a more reliable assessment of the impact of demographics, social structure and economical situation on subjective well-being (Hayes & Joseph, 2003). Previous research has shown that higher subjective well-being is associated

especially with lower levels of neuroticism and higher levels of extraversion (Gutierrez et al., 2005). The tendency to have an optimistic outlook on life obviously has a positive effect on the evaluation of life, regardless of specific circumstances (Veenhoven, 1994). Furthermore research on the relation between optimism and subjective well-being indicates significant positive correlations (Wrosch & Scheier, 2003). Taking optimism into account, therefore, allows us to assess the relevance of both subjective and objective factors on well-being in a more reliable manner.

3.3.5 Community level determinants

Next to all these individual level explanations, we expect that the context in which people live will also influence their level of well-being. Previous research has indicated that unemployment levels (Oswald, 1997), income levels (Clark & Oswald, 1994), crime rates (Dolan et al. 2008), openness of political institutions (Frey & Stutzer, 2000) and ethnic diversity within the community (Putnam, 2007; Hooghe et al., 2009) are expected to play a role in this regard. The assumption is that subjective well-being will be lower in deprived communities with high levels of unemployment and crime. Authoritarian political institutions too, are thought to have a depressing impact on the level of subjective well-being. It is important in this regard to make a distinction between compositional effects and community-level effects. Almost self-evidently, average levels of well-being will be lower in deprived communities. The assumption, however, is that even controlling for one's own level of income, or one's own experience with unemployment, community level indicators of crime, unemployment and income will still have an impact on individual well-being.

3.4 Hypotheses

Thus far, most research focuses on either psychological or social correlates of well-being. Although it has been stated that the context people live in might affect their subjective well-being this has not been tested extensively in a European context. Therefore, a number of complementary hypotheses are developed:

> *H1: We expect that living with a partner, having a high income and being employed will have a positive effect on subjective well-being.*
> *H2: Social connectedness and generalized trust will have a positive influence on subjective well-being.*
> *H3: Unemployment and crime in one's community will have a negative impact on subjective well-being.*

3.5 Data and methods

These hypotheses will be investigated using data from the Social Cohesion Indicators Flanders (SCIF) Survey and the third wave of the European Social Survey (ESS) for Belgium. While both of these data sources have some shortcomings from the perspective of our study, combined they do allows us to solve all of our research questions. The SCIF-survey is a representative survey of respondents in Flanders between 18 and 85 years old. Flanders is the northern autonomous region of Flanders, with 6,162,000 inhabitants or 58 percent of the total Belgian population. A face-to–face interview methodology was chosen since this method of interview allows for longer interviews and more reliable answers on complicated measurement instruments. In total, 2,080 respondents participated in the survey. The interviews were carried out between April and July 2009. Respondents were sampled in such a manner that the resulting set is ideally suited for the purpose of multilevel research, with on average 52 respondents in each of the 40 sampled communities (Hooghe, Vanhoutte & Bircan, 2009). The Flanders region, however, is rather homogeneous with typically low unemployment levels. Therefore, we will also rely on the Belgian sample within the European Social Survey 2006. The survey contains information on 1,798 respondents, of which 63 percent live in the Flemish region, 32 percent live in the Walloon region and 5 percent live in Brussels (Jowell, 2007). Data were geo-coded, so that for the ESS respondents too, we could

link respondents to specific community characteristics[1]. Although the ESS questionnaire only included information on 'general well-being', this study covers a broader territory than the SCIF data, as unemployment levels are markedly higher in the Brussels and Walloon regions of Belgium. Both data sets allow us to make a link between individual scores and community level indicators. Belgium is divided in 589 municipalities, with a high degree of autonomy. Municipalities on average have 17,000 inhabitants, so they can still be considered as real communities for most of the population.

3.5.1 Subjective well-being

The fact that we have to use two different data sets, leads to the use of different operationalizations of subjective well-being measurements. The dependent variable in the analysis is first of all the subjective well-being of respondents. Research has shown that using multiple indicators of life satisfaction leads to more reliable results than a single question on global life satisfaction (Kahneman & Krueger, 2006). In constructing the SCIF questionnaire we closely followed the Cummins (1995) approach to arrive at a valid measurement of subjective well-being. This implies that respondents were asked to rate several life domains on a scale from 0 to 10 (low to high satisfaction). Items included in the SCIF questionnaire were, next to a global measure, satisfaction with health, leisure time, family life, social life, sexual life, the way democracy works and the kind of society we live in (Table 3.1). It is clear that the last two items measure a different kind of satisfaction, which is reflected in the fact that they constitute a different factor. From this scale, we therefore derive two main dependent variables: individual subjective well-being (with the items referring to the individual situation) and social subjective well-being (with the items referring to society as a whole). Given the strong factor loadings of the items, an analysis on individual items did not prove to be meaningful as this would not lead to additional information. While the various items can be distinguished theoretically, the empirical analysis shows quite convincingly that they refer to a single latent concept. Both subjective well-being scales will be used as dependent variable in the first step of the analysis (based on the SCIF data for the Flemish region). Subsequently, a more limited measurement of subjective well-being will have to be used if we expand the analysis to include the whole of Belgium.

[1] We are very grateful to Geert Loosveldt and Koen Buellens of the Belgian ESS team who have made this information available.

The results show that respondents are most satisfied with their family life (an average scores of 8.23), social life and life in general, while there is somewhat less satisfaction with one's leisure time and sexual life. For the social subjective well-being scale, average scores are much lower. Missing values were imputed using the EM method, which was justified since Little's MCAR test was significant at the p=.000 level.

Table 3.1 Subjective Well-Being Scales in the SCIF Survey 2009

	Factor Loadings Individual Subjective Well-Being	Factor Loadings Social Subjective Well-Being	Cronbach's alpha if deleted	Scale average (0-10)
How satisfied are you with your life in general?	0.739		0.746	7.91
How satisfied are you with your health?	0.575		0.783	7.45
How satisfied are you with your leisure time?	0.585		0.788	7.29
How satisfied are you with your family life?	0.794		0.734	8.23
How satisfied are you with your social life?	0.784		0.734	7.77
How satisfied are you with your sexual life?	0.703		0.765	7.29
How satisfied are you with the way democracy works in Belgium?		0.916		5.07
How satisfied are you with the kind of society we live in?		0.910		5.56

Note. N=2,079. Principal component analysis of Subjective Well-Being Scales. Two factors: 59.47 % explained total variance, Eigenvalues: 3.339 , 1.419. Cronbach's alpha: 0.790 and 0.814. Source: SCIF survey 2009.

3.5.2 Individual-level variables

In the analyses, we will control for income, unemployment and household composition, as it is hypothesized that these factors will have an impact on subjective well-being. Income was measured as the household income. In the analysis, the natural logarithm of the equivalent household income is used to normalize the distribution.[2] Item non-response to the question on family income remained limited to 12 percent of all respondents in the SCIF survey and 13 percent in the Belgian ESS sample. The mean household income in the sample is 2,837 euro/month in the SCIF data set and 2,711 euro/month in the ESS sample.

Furthermore, we asked respondents about their professional status. In the SCIF survey this resulted in 53 percent of respondents having paid work, 25 percent is retired, 8 percent are

[2] Hagenaars et al. (1994) have developed the OECD modified household equivalence scale, which takes in account the number of people in a household. Applying this formula did not lead to other results with regard to the effect of family income.

students, 5 percent is unemployed and 8 percent is at home or not able to work. The relative high number of pensioners in the SCIF sample is due to the fact that sampling continued up to the age of 85, and the percentage reflects the ageing structure of the population of the Flemish region. For the ESS sample, figures are 50 percent paid work, 20 percent retired, 10 percent students, 6 percent unemployed, and 15 percent at home or not able to work. The higher rate of respondents at home or not able to work in ESS is probably due to the higher number of respondents in the 'other' category, which we recoded in this group. Furthermore, we will also control for gender and age. Given the expectation of a U-shaped effect of age, we also include age squared. Since we expect family composition matters for individual well-being, we distinguished respondents living with a partner and those living alone, and we also included information on if there was a child under the age of 16 present in the household.

As indicators for social capital, both structural and attitudinal features are used. Informal social networks are operationalized by the frequency of visits to family, inviting friends at home and visiting concerts and exhibitions, where respondents could answer on a six point scale with categories ranging from never (1) to more than once a week (6). Formal social networks are taken into account by including information on whether the respondent is an active member of voluntary associations or not (dummy variable). In the ESS the frequency of visits to friends and families relies on just one item instead of two, and there is no good measure for active participation in associational life, so this analysis will have to remain less comprehensive.

Finally, we also include generalized trust as it is expected that people who are more trusting will also have a higher level of subjective well-being. Generalized trust was measured by including three questions: 'Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?', 'Would you say that most of the time people try to be helpful or that they mostly look after themselves?' and 'Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?'. All three questions form one coherent factor (Eigenvalue 2.01; 66.8 percent of explained variance; Cronbach's alpha: 0.74 in SCIF and Eigenvalue 1.85; 61.7 percent of explained variance; Cronbach's alpha 0.69 in ESS).

A shortened version of the Re-evaluated Life Orientation Test (Scheier, Carver & Bridges, 1994), a scale for discursive optimism was included in SCIF. It consists of five items expressing statements such as "I never expect things to turn out positively for me", "In general I expect more good than bad things to happen with me", on which the respondent could answer on a five point scale ranging from 1 (totally disagree) to 5 (totally agree). The

scale is one-dimensional, with one dominant factor (Eigenvalue of 2.38, 47.7 percent explained variance). The ESS used the original Life Orientation Test (Scheier & Carver 1985), using 4 similar items, and the same scale for the answers. The Principal Components analysis yields one factor (Eigenvalue of 2.10, 52.4 per cent explained variance). All individual level variables are presented in Table 3.2 and 3.3.

Table 3.2 Frequencies of Individual-level variables for SCIF data (Flemish Region)

Variable	Missing	Mean	Std. Dev.	Minimum	Maximum
Individual Subjective Well-Being	1	0	1	-5.33	2.34
Social Subjective Well-Being	1	0	1	-3.2683	3.120027
General Satisfaction with life (item)	3	7.91	1.59	0	10
Age	0	47.19	17.94	17	84
Age²	0	2548.34	1763.11	289	7056
Gender (0=men; 1=women)	0	0.52	0.50	0	1
Educational level (low)	0	0.28	0.45	0	1
Educational level (high)	0	0.31	0.46	0	1
Family income (ln)	263	7.22	0.62	1.10	10.41
Unemployed	2	0.05	0.22	0	1
At home	2	0.08	0.28	0	1
Retired	2	0.25	0.43	0	1
Student	2	0.08	0.27	0	1
Living with partner	0	0.68	0.47	0	1
Living with child under 16	0	0.29	0.46	0	1
Generalized Trust	0	53.8	18.07	0	100
Frequency of family visits	2	4.26	1.38	1	6
Frequency of inviting friends	1	3.30	1.35	1	6
Frequency of visiting exhibitions, concerts, …	1	1.86	0.89	1	6
Active membership of organizations	6	0.58	0.49	0	1
Optimism	0	0	0.87	-3.57	1.73

Note. Total n=2,080. Frequencies and characteristics of individual level variables used in the analysis. Source: SCIF Survey 2009.

Table 3.3 Frequencies of Individual-level variables for ESS data (Belgium)

Variable	Missing	Mean	Std. Dev.	Minimum	Maximum
General satisfaction with life (item)	3	7.409	7.409	0	10
Age	0	46.194	18.643	14.417	95.333
Age²	0	2481.240	1814.746	207.840	9088.444
Gender (0=men; 1=women)	0	0.467	0.499	0	1
Educational level (low)	1	0.359	0.480	0	1
Educational level (high)	1	0.278	0.448	0	1
Family income (ln)	242	7.129	0.648	3.689	9.306
Unemployed	57	0.059	0.236	0	1
At home	57	0.147	0.354	0	1
Retired	57	0.200	0.400	0	1
Student	57	0.096	0.295	0	1
Living with partner	6	0.641	0.480	0	1
Living with child under 16	6	0.390	0.488	0	1
Generalized Trust	3	0.000	1.000	-3.031	2.851
Frequency of visiting family and friends	3	5.202	1.450	1	7
Frequency of participating in local activities	5	2.641	1.053	1	5
Active membership of organizations	3	7.409	7.409	0	10
Optimism	6	0.000	1.000	-3.841	2.013

Note. Total N=1,798.Frequencies and characteristics of individual level variables used in the analysis. Source: SCIF Survey 2009.

3.5.3 Community-level variables

The aim of this article is to investigate whether community characteristics play a role in determining individual well-being. The literature allows us to assume that subjective well-being will be lower in deprived urban regions with high levels of unemployment and crime. Therefore, population density, crime rates and the average income per inhabitant will be used as community level variables (Table 3.4). Population density was taken from the official population register. Unemployment rates were obtained from the Ministry of Labor, and they are expressed in the percentage of the labor population that is fully unemployed. Violent crime rates, finally, were taken from the statistics of the Belgian federal police. Given the small numbers involved in any single observation year, here we included the average crime rate for the years 2001-2006. Here too, the variation is significant, with a range from 4.3 violent crimes per 1,000 inhabitants in the safest community to 28.2 crimes/1,000 inhabitants in the least safe community in Flanders. Contrary to the situation in Switzerland, Belgian municipalities do not differ with regard to their institutional structure, so there was no point in

including information about the democratic openness of municipalities (Frey & Stutzer, 2000).

Table 3.4 Frequencies of Community-level Variables

	Flemish Region				
	Missing	Mean	Std. Dev.	Minimum	Maximum
Unemployment rate 2005	0	7.95	2.84	4.58	15.14
Population density 2006	0	587.13	483.60	121.51	2238.38
Average violent crime rate 2001-2006	0	12.47	5.71	4.32	28.22
	Belgium as a Whole				
	Missing	Mean	Std. Dev.	Minimum	Maximum
Unemployment rate 2005	0	10.95	6.31	3.14	33.36
Population density 2005	0	691.48	1813.54	22.16	20766.73
Average violent crime rate 2001-2006	0	12.35	5.26	0.00	36.04

Note. N=589 municipalities for Belgium, 308 for the Flemish region Indicators at the Community level, obtained from the Ministry of Labor, population statistics and Belgian Federal police.

3.6 Results

The analysis will proceed in two steps: first a stepwise OLS regression will estimate the impact of the individual level variables on both individual and social subjective well-being. Given the fact that subjective well-being was measured as a principal component, an ordinary least square regression was preferred. Departing from a model that examines the influence of the socio-demographic characteristics and the position in the social structure, we will subsequently add indicators of social capital to the model. In a final step a measure for optimism will be added to the model, so that the relevance of the objective indicators and of social capital can be assessed in a fully controlled manner.

Second, we will take the analysis a step further by investigating the occurrence of local variation in subjective well-being, using both Flemish and Belgian data. We will explain this variation by including community level and individual level variables simultaneously in one multilevel regression analysis.

Table 3.5 Individual-level predictors of Individual Subjective Well-being in the Flemish Region

			Model I		Model III		Model III	
			B (Std. Error) Sig.	Beta	B (Std. Error) Sig.	Beta	B (Std. Error) Sig.	Beta
Social Structure	(Constant)		-0.587 (0.074)***		-1.326 (0.126)***		-1.102 (0.121)***	
	Gender (Ref. Male)		-0.057 (0.046) ns	-0.029	-0.185 (0.068) **	-0.092	-0.156 (0.065) *	-0.078
	Age (in years)		-0.005 (0.002)*	-0.087	-0.009 (0.003)**	-0.163	-0.008 (0.003)**	-0.144
	Age ²		0.0002 (0.0001)*	0.067	0.001 (0.000)***	0.190	0.001 (0.000) ***	0.186
	Educational level (Ref. finished secondary education)							
		Lower secondary	-0.067 (0.058) ns	-0.030	-0.014 (0.057) ns	-0.006	-0.025 (0.055) ns	-0.011
		Higher education	-0.005 (0.054) ns	0.002	-0.102 (0.55) ns	-0.048	-0.135 (0.053) *	-0.063
	Living with partner (Ref. Not living with partner)		0.721 (0.056) ***	0.324	0.883 (0.077)***	.397	0.834 (0.074) ***	0.375
	Living with child under 16 (Ref. Not living with child)		0.023 (0.056) ns	0.012	0.034 (0.056) ns	0.017	0.007 (0.053)	0.003
	Family income (Ln)		0.148 (0.039) ***	0.091	0.132 (0.038)**	0.081	0.112 (0.036)**	0.069
	Occupational status (Ref. Employed)	Retired	0.173(0.090) ns	0.076	0.140 (0.088) ns	0.062	0.134 (0.084) ns	0.059
		Student	0.525 (0.153) ***	0.115	0.108 (0.150) ns	0.024	0.091 (0.143) ns	0.020
		At home	-0.204 (0.092)*	-0.056	-0.204 (0.090)*	-0.056	-0.168 (0.086) *	-0.046
		Unemployed	-0. 392 (0.107)***	-0.086	-0.323 (0.105)**	-0.071	-0.231 (0.100) *	-0.051
Social Capital	Frequency of family visits				0.060 (0.017) ***	0.083	0.054 (0.016) **	0.074
	Frequency of exhibitions and concerts				0.069 (0.028) *	0.059	0.044 (0.027) ns	0.038
	Frequency of inviting friends				0.064 (0.017)***	0.084	0.043 (0.017) *	0.056
	Active Membership of organizations				0.047 (0.065) ns	0.023	0.034 (0.062) ns	0.017
	Generalized Trust				0.090 (0.26) **	0.078	0.026 (0.025) ns	0.023
Subjective indicators	Optimism						0.437 (0.055)***	0.377
Interactions	Age*Living with partner				0.010 (0.003) **	0.129	0.008 (0.003) **	0.109
	Age²*Living with partner				-0.001 (0.000) **	-0.138	-0.001 (0.000) ***	-0.137
	Gender*Active participation				0.228 (0.088) *	0.101	0.191 (0.085) *	0.085
	Gender*Optimism						0.124 (0.049) *	0.080
	Age*Optimism						0.004 (0.001) **	0.059
	Living with partner*Optimism						-0.303 (0.053) ***	-0.220
	R^2		.137		.187		.263	

Note. N=2079. Results of single level OLS regression. Dependent variable: factor scores on individual subjective well-being. Data: SCIF-survey 2009,. Sig.: ns p>.05 *:p<.05; **p:<.01.; ***p<.001.

Table 3.5 presents the results of the OLS regression analysis on individual subjective well-being. The first model shows that gender has no significant effect on individual well-being, as was expected. Both age and age-squared are significant, and the quadratic term is positive, therefore the U-shaped relation between age and well-being found in the literature is confirmed with our data. Educational level does not seem to have a significant effect on well-being, controlling for other indicators of position in the social structure. Household composition yields strong effects: respondents living with their partner are significantly more satisfied with their life. The presence of children, however, does not have a significant effect. The level of the family income has a positive effect on well-being, confirming that economic conditions are a part of the picture, but not the most important one. Looking at occupational status, we can observe that the unemployed and people without a paid job are less satisfied, other factors being equal. It should be noted that being unemployed, controlling for household income, still has a negative influence on subjective well-being. This might serve as an indication that having a job is not only important for economic reasons.

In Model II indicators of participation in networks and generalized trust are added to the model. The explained variance of the model rises from .14 to .19. All social capital indicators have moderate positive impacts on well-being, underlining the importance of being involved, through active participation in organizations or through participating in cultural life, and of receiving social support, through intensive contacts with family or friends, and of trust in others. A remarkable finding is that active participation in associational life matters especially for women. Including social capital variables in the model weakens somewhat the socio-demographical effects, but in general this module clearly adds to our ability to explain subjective well-being.

Model III adds optimism to the model, so we can control for a general propensity of the respondents to have a rosy outlook on all domains of life. Indicators of social background and social capital remain significant, even when controlling for a positive perception of reality. Although optimism in general seems to have a strong correlation with subjective well-being, it has an even larger effect for older people and for women. The influence of optimism on well-being for people living with their partner is significantly smaller. The current analysis confirms that living with a partner has a strong effect, both directly and as a result of the interaction effect with age and optimism. In the social capital domain, frequent contact with family seems to have the strongest effect on individual subjective well-being for all respondents. All these findings hold after controlling for optimism.

In Table 3.6 we turn to the second dimension of subjective well-being, the social subjective well-being or satisfaction with the society one lives in. The results of this analysis are not that impressive. Only age has a meaningful negative influence on satisfaction with society, which remains strong after controlling for social capital and optimism. Generalized trust on the other hand is strongly associated with a higher level of social subjective well-being. Optimism also has a positive relation with social well-being. In total the model offers a modest explanation: younger people, people who trust others more and optimistic people, have a more positive opinion on the state of society. The explained variance of this model, however, remains much lower than for the model on individual subjective well-being. The analysis confirms the structural difference between determinants of individual and social subjective well-being, as social subjective well-being can only be explained very partially by individual and community level variables (Table 3.6).

Table 3.6 Individual-level predictors of Social Subjective Well-being

		Model I		Model II		Model III	
		B (Std. Error) Sig.	Beta	B (Std. Error) Sig.	Beta	B (Std. Error) Sig.	Beta
	(Constant)	-0.181 (0.076)*		-0.248 (0.115) *		-0.191 (0.116) ns	
	Gender (Ref. Male)	-0.017 (0.047) ns	-0.009	0.016 (0.044) ns	0.008	-0.020 (0.045) ns	0.010
	Age (in years)	-0.006 (0.002)**	-0.113	-0.007 (0.002)**	-0.131	-0.007 (0.002)**	-0.130
	Age ²	0.000 (0.000) ns	0.029	0.000 (0.000) ns	0.018	0.000 (0.000) ns	0.017
	Educational level (Ref. finished secondary education)						
	Lower secondary	0.057 (0.059) ns	-0.029	0.097 (0.057) ns	0.044	0.096 (0.057) ns	0.044
	Higher education	0.235 (0.055) ***	0.114	0.082 (0.054) ns	0.040	0.067 (0.055) ns	0.033
Social Structure	Living with partner (Ref. Not living with partner)	0.024 (0.057) ns	0.011	0.026 (0.054)ns	0.011	0.014 (0.054) ns	0.006
	Living with child under 16 (Ref. Not living with child)	0.079 (0.057) ns	0.040	0.060 (0.054) ns	0.031	0.055 (0.054)	0.028
	Family income (Ln)	-0.007 (0.040) ns	-0.005	-0.014 (0.038)ns	-0.009	-0.019 (0.038) ns	-0.012
	Occupational status (Ref. Employed)						
	Retired	0.097(0.092) ns	0.044	0.140 (0.088) ns	0.063	0.138 (0.084) ns	0.063
	Student	0.207 (0.133) ns	0.047	0.052 (0.130) ns	0.012	0.050 (0.143) ns	0.011
	At home	0.073 (0.094)ns	0.021	0.204 (0.089) ns	0.026	0.104 (0.089) ns	0.029
	Unemployed	-0.276 (0.109)*	-0.062	-0.199 (0.104) ns	-0.045	-0.174 (0.105)	-0.039
	Frequency of family visits			0.002 (0.016) ns	0.003	0.000 (0.016) ns	0.000
	Frequency of exhibitions and concerts			0.034 (0.027) ns	0.030	0.029 (0.028) ns	0.026
Social Capital	Frequency of inviting friends			0.017 (0.017) ns	0.023	0.011 (0.017) ns	0.015
	Active Membership of organizations			-0.038 (0.046) ns	-0.020	-0.047 (0.046) ns	-0.024
	Generalized Trust			0.371 (0.26) ***	0.333	0.350 (0.026) ***	0.315
Subjective indicators	Optimism					0.094 (0.026)***	0.084
	R^2	.031		.138		.144	

Results of single level OLS regression. Dependent variable: factor scores on social subjective well-being. Data: SCIF-survey 2009, n=2079. Sig.: ns p>.05 *:p<.05; **p:<.01.; ***p<.001.

3.7 Multi-level analysis

The previous analysis, of course, was limited to the individual level and it allowed us to determine the most important individual level determinants of subjective well-being. In order to investigate hypothesis 3 we need to take an additional step in the analysis by also including community level indicators. Therefore, a multilevel model is estimated in order to investigate community level influences on subjective well-being. This kind of model allows us to include both individual and community level independent variables simultaneously in one regression model. To examine the extent of local variation, a null model is first estimated. This model only includes the dependent variable, and it serves as a baseline model to test the variation of the dependent variable on the community level (Snijders & Bosker, 1999).

Using the SCIF data, the variation at the community level in our model is absent, with little more than 0 percent of all variance that can be attributed to the level of the local community, both for individual as for social subjective well-being[4]. To make sure that this lack of community level variation is not due to the specific characteristics of the SCIF survey, we also conducted similar separate analyses on the ESS respondents living in the Flemish region. For this control, we used single items on general satisfaction with life and satisfaction with democracy as dependent variables. Including only the Flemish ESS respondents in this analysis, however, led to the same results. We can be quite confident therefore that the lack of intra-class correlation is not caused by some specific characteristics of the SCIF survey but reflects the homogeneity of Flemish communities. While on the individual level, the respondents in this survey differ quite strongly with regard to subjective well-being, we do not observe any community differences with regard to individual or social subjective well-being in the Flemish region of Belgium. Models examining variation on the community level for each of the separate domains used in the constructed scales show the same results: even if we take the items of the scale separately, there is hardly any intra-community correlation of the well-being scores[5]. One possible explanation for this lack of variation on the level of the communities is that Flanders is too homogenous, both in cultural and structural terms. Therefore, we also included an analysis on the whole of Belgium, based on the Belgian sample of the ESS.

[4] For individual subjective well-being: τ=0.00000, σ^2=0.99952, ICC ($\tau/(\tau+\sigma^2)$) =0.0000, sig=1.000. For social subjective well-being: τ=0.00782, σ^2=0.99181, ICC ($\tau/(\tau+\sigma^2)$) =0.00782, sig=0.054.

[5] For the other indicators too, intra-class correlation remained extremely limited: satisfaction with leisure time (0.14 per cent); with family life (0.46 per cent) and sexual life (0.59 percent).

As was already noted, the ESS questionnaire only included the general question on subjective well-being and, therefore, we had to rely on this single item. The following analysis is based on the question: “How satisfied are you with your life in general?” As could already be observed in Table 3.1, however, this single item loads quite strongly on the factor scale, so we can assume that this measurement by itself already includes quite some information on the state of subjective well-being. By restricting the analysis to this item on general subjective well-being, we can use the same dependent variable, both for the Flemish as for the Belgian data, and these data will be used in two different random intercept multilevel models (Table 3.7).

Table 3.7 The Impact of Individual and Community indicators on General Subjective Well-Being

	SCIF (Flemish Region)	ESS (Belgium)
	B (Std. Error) Sign.	B (Std. Error) Sign.
(Constant)	6.990 (0.192) ***	6.195 (0.560) ***
Level 1: Individual		
Gender	0.032 (0.068) ns	-0.267 (.084) **
(Ref. Male)		
Age (in years)	-.006(0.004) ns	-0.005 (.004) ns
Age ²	0.001 (0.0002) ***	0.0002 (.0002) ns
Educational level		
(Ref. finished secondary education)		
Lower secondary	-0.019 (0.085) ns	-0.032 (0.103) ns
Higher education	-0.048 (0.081) ns	0.103 (0.104) ns
Living with partner	0.837 (0.116) ***	0.656 (0.105) ***
(Ref. Not living with partner)		
Living with child	0.044 (0.084) ns	-0.082 (0.100) ns
(Ref. Not living with child)		
Ln (family income)	0.180 (0.057) **	0.085 (0.070) ns
Occupational status		
(Ref. Employed)		
Retired	-0.113 (0.133) ns	-0.037 (0.170) ns
Student	-0.174 (0.226) ns	0.468 (0.217) *
At home	-0.252 (0.135) ns	-0.253 (0.194) ns
Unemployed	-0.439 (0.159)**	-0.264 (0.138) ns
Frequency of family visits	0.055 (0.025) *	0.109 (0.029) ***
Frequency of inviting friends	0.033 (.0.026) ns	
Generalized Trust	0.167 (0.040) ***	0.226 (0.042)***
Optimism	0.770 (0.086) ***	0.821 (0.077)***
Age* Living with partner	0.016 (0.004)**	
Age²*Living with partner	-0.001 (0.0002)*	
Gender*Optimism	0.206 (0.076)**	0.210 (0.083)**
Age*Optimism	0.009 (0.002)***	
Living with partner*Optimism	-0.481 (0.084)***	-0.422 (0.084) ***
Level 2: Community		
Population density (*100)	.002 (.009) ns	-0.007 (0.003) *
Violent Crime Rate	-.010 (.009) ns	0.022 (0.009) *
Unemployment Rate	-.006 (.018) ns	-0.047 (0.009) ***
Level 2 Variance full model	0	0
Level 1 Variance full model	1.8635	2.3955
ICC full model	0	0
Level 1 R^2 full model	.2671	.2863
Level 2 R² full model	0	1
Level 2 Variance null model	0	0.1388
Level 1 Variance null model	2.5424	3.3566
ICC null model	.0000	.0397
Number of cases	1783	1504
Number of level 2 observations	40	220

Results of a Random intercept multilevel analysis of the SCIF survey 2009 and ESS round 3. Dependent variable: item on general life satisfaction. Only significant interactions are included, for each analysis separately. Sign: *:p<.05; **p:<.01.; ***p<.001.

The comparison between both analyses (Table 3.7) suggests that the most important individual level determinants of general subjective well-being are the same in both data sets. Living together with a partner, generalized trust and optimism are confirmed to be strong

determinants of subjective well-being measurements. Most important, however, is the fact that we observe strong differences on the community level. For the Flemish region by itself, the intra class-correlation at the level of the communities is exactly 0.00, and therefore there is nothing to be explained at this level. Taking Belgium as a whole, however, yields a modest intra class-correlation of 3.97 percent, and most of it can be explained by the unemployment rate. It has to be remembered in this regard that the Flemish region is considered as economically successful and in practice is quite homogeneous. In the Flemish region, the average unemployment rate stands at 8 per cent, with a range between 4.6 and 15.1 per cent of the labor population. Taking Belgium as a whole, however, we obtain an average unemployment rate of 12.4 percent, ranging between 0 to a maximum of 36 percent. Including this larger variation, apparently leads to the fact that the unemployment level of the community becomes significant, even when including controls on whether the respondent is unemployed or not.

3.8 Discussion

In this article we examined individual and contextual determinants of subjective well-being in Belgium. On the individual level, our findings confirmed earlier research on the importance of living together with a partner. It is important to note, however, that informal networks (e.g., having friends) and generalized trust remain important determinants of subjective well-being, even after including strong control variables like optimism. Access to social capital, therefore, clearly contributes to a feeling of subjective well-being. Hypotheses 1 and 2 were therefore confirmed for the Belgian context. It is important to note here that all these effects remained significant, even after controlling for a general sense of optimism. We can therefore safely conclude that subjective well-being is not just the reflection of a specific optimistic outlook toward life.

In line with earlier research, we also expected communities to have an impact on subjective well-being and for this reason we used multi-level analysis, including both individual level and community level determinants of subjective well-being. In this multi-level analysis, we see a marked difference between the results for the Flemish region, and for Belgium as a whole. For the rather homogeneous Flemish region, we can observe that there is hardly any intra class-correlation, so we can conclude there are no significant community level

determinants of subjective well-being. Using data on Belgium on the other hand, led to significant community influences, mainly of the local unemployment rate. Hypothesis 3 therefore received mixed results: communities matter if the structural indicators differ substantively.

The obvious conclusion therefore is that the region of Flanders simply is too homogeneous, both in cultural and structural terms, to detect strong community effects[6]. This might explain some of the confounding conclusions that we encountered in the literature on community level effects on subjective well-being. Contextual explanations for the level of subjective well-being have been found in countries with a substantial economic heterogeneity, such as the US, where there are substantial social and economic differences within the population. Income inequality differences in Flanders are quite limited. Crime levels too, tend to be rather low, while the small scale of the region allows for a good distribution of public services across the territory. Real deprived areas in Flanders do exist, of course, but they tend to be rather small and dispersed across the territory. Apparently under these circumstances of homogeneity, community characteristics do not have an impact at all on subjective well-being. It is only if we are able to include regions with much higher levels of unemployment (and these are typically found in Brussels or in the Walloon region), that we find any intra class-correlation on the community level. This suggests some form of threshold model with regard to community impact. One can assume that well-being is lower in extremely poor, crime-ridden, deprived areas. If such a form of segregation and deprivation does not exist however, apparently marginal differences do not play a role anymore. In a society where all communities reach acceptable levels of material comfort and social cohesion, further gains in standard of living do not seem to have an additional impact on subjective well-being. Our expectation, therefore, is that significant community level determinants of subjective well-being will be found mainly in unequal societies with strong patterns of social and spatial segregation, while the community level might be non-significant in more equal or homogeneous societies. Comparative research, including data from different countries, will have to determine whether this expectation is indeed warranted.

[6] We have to add here that Belgium is usually considered as a 'diverse society'. Linguistic segregation policies however, imply that the Flemish region that we investigated in homogenously Dutch speaking, while the Walloon region in the South of the country is homogeneously French speaking. Only in the capital Brussels (ca. 1 million inhabitants) the language groups are not segregated. As such, the region of Flanders can be considered as a homogeneous society, both with regard to language as with regard to income distribution.

Chapter 4

An Ecological Study of Community Level Correlates of Suicide Mortality Rates in the Flemish Region of Belgium, 1996-2005

Abstract

An ecological study of age-standardized suicide rates in Belgian communities (1996-2005) is conducted using spatial regression techniques. Community characteristics are significantly related to suicide rates. There is mixed support for the social integration perspective: single person households are associated with higher suicide rates, while religious participation is unrelated and both immigration and the presence of non-European inhabitants have a negative impact. Deprivation has a positive relation with suicide. Population density has a negative influence on suicide rates. Areas with older populations have higher suicide risks than expected by composition alone. A spatial contagion effect of neighboring communities is present for men.

This chapter is based on the following article:
Hooghe, M., & Vanhoutte, B. (2011). An ecological study of community level correlates of suicide mortality rates in the Flemish region of Belgium, 1996-2005. *Suicide and Life Threatening Behaviour, 41*(4), 453-464.

4.1 Introduction

In recent years, various studies on community level correlates of suicide rates have been published, without, however, leading to any final conclusions (Knox, Conwell, & Caine, 2004; Rehkoph & Buka, 2006). Most of these studies are based on American data, and the number of studies on ecological correlates of suicidal behavior in a different cultural context remains rather limited (Agerbo, Sterne, & Gunnell, 2007; Neeleman, 1998). The available evidence suggests that in developed countries, social integration indicators are strongly related to suicide rates (Fernquist & Cutright, 1998; Helliwell, 2007). While the older literature tends to focus on traditional mechanisms of social integration, like organized religion, in the more recent literature attention is concentrated on social fragmentation and isolation, socio-economic deprivation and differences between rural and urban areas (Congdon, 1996; Evans, Middleton, & Gunnell, 2004; Pescosolido & Georgianna, 1989; Whitley, Gunnell, Dorling, & Davey Smith, 1999).

In this article we investigate the association between community level indicators and suicide rates in the Flemish region of Belgium. Flanders has one of the highest suicide rates in Western Europe (14.7 per 100,000 inhabitants), roughly in line with the level of France (14.8 per 100,000 inhabitants), but markedly higher than in neighboring countries Germany and the Netherlands, with respectively 9.8 and 8.7 suicides per 100,000 inhabitants (all rates 2006). We focus on the level of the local community since it can be argued that this offers an effective small-scale interaction context for most residents, and numerous statistical indicators are also available on this level, allowing us to develop a comprehensive multivariate model. To avoid any misunderstandings, it has to be stressed here that the current data do not allow us any interference at all about individual suicidal behavior. Our analysis therefore remains limited to observing meaningful associations between community characteristics and suicide rates within these communities.

We first review the literature on community level differences in suicide rates, before presenting data and methods. Using a spatial regression model we assess the community level correlates of suicide, before drawing conclusions, both with regard to the scholarly interest in suicide and community characteristics, and the possible implications for preventive policies.

4.2 Literature

Epidemiological evidence suggests the occurrence of strong and persistent social differences in suicide rates, and this pattern by itself calls for a social study of suicide rates (Claassen, Yip, Corcoran, Bossarte, Lawrence, & Currier, 2010; Helliwell, 2007; Mainon & Kuhl, 2008). While in the United States, Canada and the United Kingdom, various studies are available on suicide rates at the local level (Congdon, 1996; Baller & Richardson, 2002; Kowalski, Faupel, & Starr, 1987; Whitley et al., 1999), for continental Europe few studies are available, and most of these focus on an explanation of country level diffusion patterns (Ferretti & Coluccia, 2009). Although these country-level studies certainly have led to the development of new insights on the variation in suicide rates, it can be argued that they do not cover the full story. First of all, it can be observed that suicide rates show important variations *within* a society, and these important differences tend to be obscured if we only focus on national averages. Second, from a theoretical point of view it can be argued that social integration is a process that occurs most intensively and successfully at the local level of neighborhoods or municipalities (Sampson, Morenoff, & Gannon-Rowley, 2002). Third, meta-analysis has shown that the strongest associations between suicide levels and deprivation can be found in studies assessing the impact of the neighborhood or community level, not in studies that use the country level as an explanatory variable (Rehkopf & Buka, 2006). This suggests that the most important social processes operate on the community level, not on a larger level of aggregation. By focusing on the community level, we return to one of the oldest traditions in suicide studies, where community level integration was seen as one of the most important determinants of suicidal behavior (Durkheim, 1897; Johnson, 1965).

Previous research on the geographic area correlates of suicide rates suggests that three dimensions need to be taken into account: social integration, deprivation and the rural/urban divide (Bunting & Kelly, 1998; O'Reilly, Rosato, Connolly, & Cardwell, 2008; Rehkopf & Buka, 2006; Skapinakis, Lewis, Araya, Jones & Williams, 2005). One of the confounding elements in this line of study, however, is the tendency to rely on a composite indicator for geographic area characteristics, taking into account various indicators of deprivation, poverty and exclusion simultaneously (Congdon, 1996; Congdon, 2009; O'Reilly, et al. 2008). The risk associated with this approach is that it can obscure the precise correlates of suicidal behavior, as different kinds of community characteristics are lumped together. Therefore we will focus on distinct indicators in this study.

Already in the 1897 Durkheim study, a lack of social integration or isolation served as a main determinant of suicidal behavior. According to Durkheim (1897), religious participation could be taken as an indicator of social cohesion, as it was assumed that religious practice would have a strong community building effect (Burr, McCall, & Powell-Giner, 1994). More recent statistical evidence confirms the relation between religious participation levels and suicide rates in the States and in the Netherlands (Martin, 1984; Neeleman, 1998; Pescosolido & Georgianna, 1989). It is assumed in these studies that the social ties that are strengthened by religious practice have an important effect in preventing social isolation (Robins & Fiske, 2009).

Marital status too can serve as an indicator of social integration, and has been shown to have a strong negative correlation with suicide (Stack, 2000b). Apart from the direct influence on the individual level, the divorce rate may act as an indicator for the general quality of relational and family life in a community (Lester, 1995). Pescosolido and Wright (1990), on the other hand, found that a high proportion of never-married individuals is related to lower suicide rates among young men.

Finally, both migration and diversity can serve as a measure for social integration (Helliwell, 2007). Internal migration, or moving from one city to another within a country, can uproot the individual from his or her community (Stack, 2000b). Immigration and an increasing ethnic and cultural diversity, too, might have a negative effect on the quality and the intensity of social interaction within a community (Putnam, 2007; Trovato & Jarvis, 1986). Even though more recent work challenges this claim (Hooghe, Reeskens, Stolle, & Trappers, 2009; Twigg, Taylor, & Mohan, 2010), it is still relevant to include this variable in the analysis.

Second, social deprivation usually is measured by including information on unemployment rates, low schooling or average income in a community. The assumption is that enrollment in the labor market is associated with a valued role in society, which is not available to the unemployed (Agerbo et al., 2007). Similarly, poverty and socio-economic exclusion have been shown to have a positive impact on suicide rates, both on the individual and the community level (Noh, 2009; Stack, 1982; Stack, 2000a).

Third, the rural-urban divide has been a major topic of investigation in ecological suicide research. Traditionally, it was assumed that suicide rates would be higher in metropolitan areas (McCall & Tittle, 2007; Weich, Twigg, & Lewis, 2006). In a recent review of the literature, a curvilinear relation between urbanization and suicide is confirmed (Stack, 2000b).

Research for the United Kingdom suggests that especially in rural areas, suicide rates have increased strongly since the 1980s (Middleton, Gunnell, Frankel, Whitley, & Dorling, 2003). For the United States too, there are some indications that, especially for men, suicide rates tend to be higher in rural settings. One of the reasons for this shift might be the ageing of the population in rural areas, compared to the younger population of urban regions (Singh & Siahpush, 2002). Qin, Agerbo, and Mortensen (2003) however, find in Denmark that while in rural areas suicide rates are higher for men than for women, the reverse is true for urban areas. In a study on Finland, Pirkola, Sund, Sailas, and Wahlbeck (2009) have argued that the presence of mental health services might have an important negative effect on suicide rates in urban areas.

Based on the literature, we can therefore hypothesize that suicide rates will be higher in communities with low levels of religious practice, in ethnically diverse communities and in poor areas with high unemployment rates. In line with the classical literature, we still assume a positive relation between population density and suicide rates.
When studying community level correlates of suicide rates it is important to control for the confounding effects of gender and age composition. First, there are strong differences in suicide rates for women and for men. Men have higher rates than women, partly because men use more violent and thus more effective methods to commit suicide. Other factors explaining the gender gap in suicide rates are related to the male social role, associated with inadequate coping strategies such as emotional inexpressiveness or a reluctance to seek help (Bossuyt & Van Calsteren, 2007; Hawton, 1998; Möller-Leimkühler, 2003). Therefore, in this study we will conduct separate analyses for male and female suicide rates.

Age too has an important impact on suicide rates, as suicide rates are about twice as high among those older than 80 than for the population between 30 and 64 (Bossuyt & Van Calsteren, 2007). Age composition might have an important confounding effect as the average age is higher in rural areas than it is in urban centers (Moksony, 1990). To control for this composition effect, we will use age-standardized suicide rates as dependent variables, taking age and gender composition effects into account. This implies that the mortality rates we use as a dependent variable in this study control for the fact that the risk of suicidal behavior is unequally spread across age groups.

4.3 Data and methods

We investigate age-standardized suicide mortality rates by gender for 308 communities in the region of Flanders, Belgium, for the period 1996-2005. Our analysis is based on two distinct data sources. On the one hand we have access to the suicide rates, based on official death certificates, confirmed by a medical doctor, and that can be considered as very reliable. In total they refer to ca. 12,000 registered cases of suicide over this ten year period. On the other hand we rely on community level social cohesion indicators for each of the 308 municipalities in the region. The Flanders region is divided in 308 municipalities with an average 20,000 inhabitants.

4.3.1 Dependent variable

As dependent variable, we use a smoothed version of the standardized mortality rates (SMR) for every community. To reduce random variation and minimize measurement error we use average SMR's for a ten year observation period (1996-2005). The SMR is the index of actual suicides over expected suicides in the period under study. The expected suicide rate was calculated taking into account age and gender composition of the community, departing from the age specific average suicide rate in Flanders. To avoid outliers in the data caused by small municipality size, we used empirical Bayes prediction assuming a normal distribution (Clayton & Caldor, 1987) as is customary in epidemiological research.[7] The advantage of using standardized rates is that both age differences in the composition of the population of a community and the population size are already integrated in the dependent variable, so that any correlation we might observe with age or population size would indicate a concentration effect instead of a composition effect.

A suicide SMR over 100 indicates a higher occurrence of suicide than is to be expected, and a score under 100 indicates a lower occurrence of suicide than is to be expected given the demographic composition in terms of age and gender of the community. We will analyze suicide rates for men and women separately, and the total rate for both genders combined. Since male suicide rates are higher than female suicide rates, suicidal behavior among men will disproportionally determine this overall indicator.

[7] This transformation increases the reliability of the SMR for small municipalities, by borrowing strength from the total population (Riggan, Manton, Creason, Woodbury & Stallard, 1991).

Data were collected in Flanders, i.e., the northern autonomous region of Belgium (population: 6,162,000 in 2008, or almost 60 percent of the Belgian population), by the Flemish Regional Agency for Health and Care. These data are only available at the regional level because suicide prevention is a regional authority.

4.3.2 Independent variables

We included various variables at the community level, as indicators for social integration, socio-economic deprivation and the rural/urban divide.

Looking at religious participation, we used a measure based on attendance figures of the Roman Catholic Church. This is the most prevalent religious affiliation in the strongly secularized region of Flanders. The actual indicator, measuring only the behavioral dimension of religion, is a factor score based on the ratio of participation to rituals such as baptism, marriage and funeral and attendance at the Christmas mass averaged over two observations, in 2006 and 2007 (Botterman & Hooghe, 2008).[8] While strictly speaking, the observation period of this independent variable is situated one year after the observation period of the dependent variable, it is safe to assume that the regional variation in religious behavior is quite stable. It has to be pointed out that Catholicism is the only religion that can play a role on the community level, as the second most prevalent religion is Islam, with only about three per cent of the population adhering to Islam.

In order to operationalize a lack of marital or relational status integration, we included the rate of single households, i.e. the rate of all inhabitants registered as living alone (only one person living at that address). Furthermore, two different migration rates are used: the internal migration rate, measuring migration within Belgium, and the external migration rate, indicating migration from outside of Belgium. The rates are the sum of incoming and outgoing inhabitants in a community per 1000 inhabitants. We use both rates, since on the community level they have a strong negative correlation (-.46) and thus clearly convey different information: communities attracting people already living in Belgium are apparently different from the communities attracting people from outside Belgium. We also included information on the presence of non-European inhabitants of the community, defined as not

[8] An analysis with the 2009 mass attendance rates on an average Sunday did not yield different results.

having the nationality of one of the 15 countries belonging to the European Union in 1996, at the start of the observations.[9]

For deprivation, various variables are available but most of them are strongly related, and cannot be used simultaneously in one analysis. In a preliminary analysis we used average income level, unemployment rate and average education level of the population one by one as unique community level correlate. This analysis showed that the average income (in euro/inhabitant) has the strongest relation with suicide rates, which is why we included it as an indicator for the socio-economic status of the geographic area.

The rural/urban divide is measured by population density (inhabitants/square kilometer).[10] High population density creates anxiety, stress and social disorganization (Levy & Herzog, 1974). The squared and cubed values of population density were also included in order to detect curvilinear effects.

As a control variable we include the ratio of elderly over the working age population, since we know elderly are a population at risk for suicidal behavior.[11]

All variables used in the analysis are listed in Table 4.1.

[9] Non-nationals from neighboring European countries are not perceived as 'foreigners' by a large part of public opinion. Attitudes toward foreigners are mainly based on perceptions about non-Europeans or visible minorities residing in the community.

[10] Population density was transformed into its natural logarithm, in order to achieve a normal distribution.

[11] To be able to separate the effect of having an older population from living in a single household, the residuals of the regression of the measure for an elderly population on the proportion of single households are used instead of the crude measures, to prevent multicollinearity. This means that the common variance of these two indicators is assigned to the proportion of elderly and not the proportion of single member household, thus leading to a very conservative test of the effect of single households.

Table 4.1 Descriptives of Variables Used in the Analysis

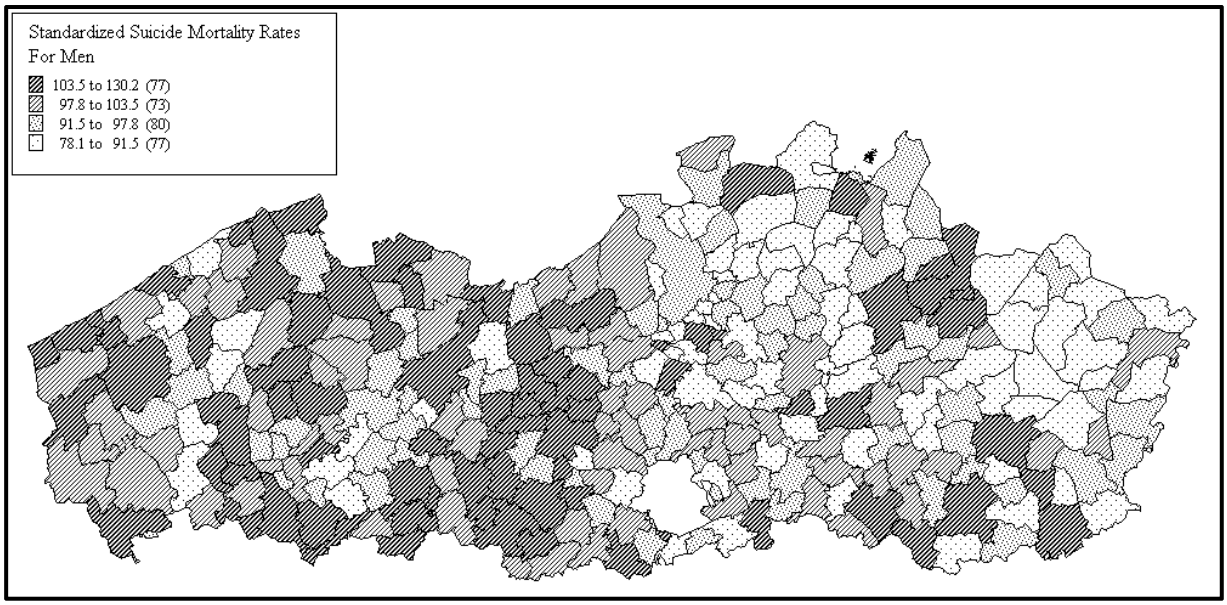
Variable	Obser-vations	Mean	Std. Dev.	Min	Max
Dependent variables					
Suicide mortality rate for men, 1996-2005	308	98.38	9.65	78.11	130.14
Suicide mortality rate for women, 1996-2005	308	97.24	8.29	79.87	131.13
Total suicide mortality rate, 1996-2005	308	97.69	11.02	77.13	133.55
Social Integration					
Religious participation (factor, 2006-2007)	308	0.00	0.99	-3.00	6.62
Proportion of single households on all households, 2000-2005	308	0.24	0.05	0.16	0.46
Internal migration rate /1000 2000-2005	308	1.45	3.98	-13.26	15.67
External migration rate /1000 2000-2005	308	1.38	2.29	-3.61	14.10
Proportion non-EU inhabitants /1000, 1996-2005	308	9.54	12.47	1.12	84.36
Deprivation					
Mean income (in 1000 euro/inhabitant) 1996-2005	308	12.66	1.56	8.82	17.60
Rural/Urban					
Population density (ln) 1996-2005	308	5.97	0.72	3.94	8.07
Control Composition Effect					
Proportion of elderly (65+) 1996-2005 in percentage of the population	308	39.28	6.02	24.05	63.13

Note. Source: SMR (dependent): Flemish Regional Agency for Health and Care: all other variables: Social Cohesion Indicators in Flanders project, Bureau for Statistics Belgium and Flemish Department of Economy.

4.3.3 Presentation of the data

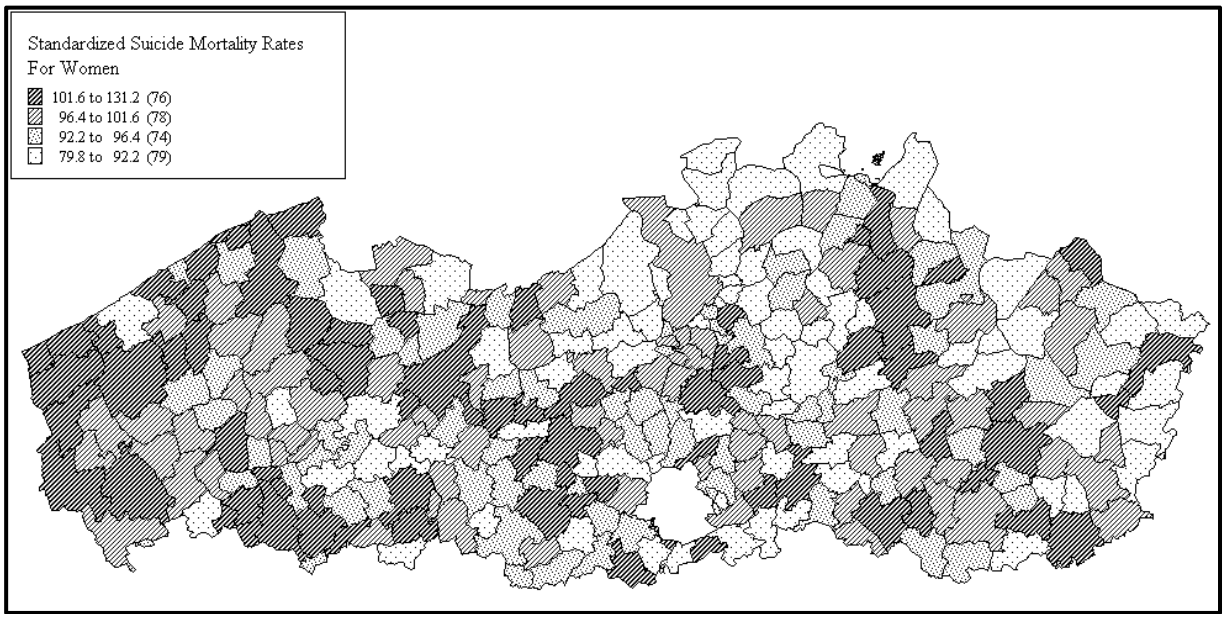
A first look at the data already suggests that community differences seem to occur. In the Figures 4.1 and 4.2 we map the Standardized Suicide Mortality Rates (SMR's) for 308 municipalities, for men and women. We observe quite some differences: while some communities have standardized mortality rates around 100, others have a significantly higher or lower rate. There is indeed quite some variation in the standardized mortality rates in the Flemish region.

Figure 4.1 Standardized Suicide Mortality Rates for Men, 1996-2005



Source: Health Agency of the Flemish Region, Belgium.

Figure 4.2 Standardized Suicide Mortality Rates for Women, 1996-2005



Source: Health Agency of the Flemish Region, Belgium.

Geographic clustering can be observed: while the communities in the Western part of the region (toward the coast and the border with France) seem to have high SMR's, these are consistently lower in the Eastern part of the region (near the border with the Netherlands).

4.4 Methods

To take account of the spatial nature of the data, spatial regression techniques will be used to analyze the data. On a more theoretical level, this technique allows us to investigate the nature of the spatial structure (Anselin, 1988; Haining, 2003).

Two forms of spatial models are commonly used to improve regressions on spatially correlated data. Theoretically, these two forms of spatial interdependence have a different interpretation. If two municipalities are adjacent, the suicide rate of the first can be influenced by the suicide rate of the other. This means that there is a contagion or dispersion effect of suicide, represented best by a spatial lag model. If the error residuals of the municipalities are influenced by one another, this substantively means that the phenomenon under study is not analyzed at the correct geographical level, or that there might be an unobserved variable correlated with the spatial structure of the data. This implies a clustering effect, better analyzed by a spatial error model (Anselin, 1988).

It is impossible to fully specify a model with both a spatial lag and spatial error component, so a choice between a spatial lag and spatial error model has to be made.[12] In the case of male and total suicide rates, a spatial lag model was clearly preferred over a spatial error model. This means that male (and total) suicide in one municipality is influenced by the male (and total) suicide rates of the neighboring municipalities. The diagnostics for female suicide rates are less clear, and while a spatial model for women is not absolutely necessary, it does not invalidate the results either. In order to be able to compare our findings, however, we will use a spatial lag model for all three suicide rates.

4.5 Analysis

Applying spatial regression gives us a clear insight in the community level associations of suicide rates (Table 4.2). The spatial lag included in the model shows a moderate impact of neighboring communities for male and total suicide rates, and a rather small effect for female suicide rates. The standardized suicide mortality rate for men in a neighboring community has a positive effect on the male suicide rates, controlling for all other theoretically relevant variables. The current analysis does not provide information on the causal mechanism involved, but some form of copying behavior might play a role in this regard. The presence of an area with high suicide rates could make suicide more acceptable in the surrounding communities (Stack & Kposowa, 2008). It has to be observed however, that for women, this mechanism does not seem to be present to the same extent. This is probably due to the different patterns of suicidal behavior for women. Since a larger percentage of suicide attempts does not lead to an actual suicide, the suicide rate might not be such a good indicator for female suicidal behavior.

[12] Computing Langrange multiplier tests on the residuals of a non spatial ordinary least squares regression model suggests if a spatial lag or spatial error model is more appropriate (Anselin et al., 1996).

Table 4.2 Spatial Lag Regression on Standardized Suicide Mortality Rates (n=307)

	Suicide Mortality Rate Men	Suicide Mortality Rate for Women	Suicide Mortality Rate Total
	Coef.(Robust SE) Sig.	Coef. (Robust SE) Sig.	Coef. (Robust SE) Sig.
Cte.	71.76 (8.69) ***	83.08 (9.23) ***	73.94 (8.81) ***
Social Integration			
Religious participation	-1.17(0.65)	-0.40 (0.45)	-1.30 (0.69)
Proportion of single households	103.79 (17.90) ***	82.62 (15.13) ***	129.35 (18.64) ***
Internal migration rate	-0.33 (0.15) *	-0.24 (0.15)	-0.41 (0.16) **
External migration rate	-0.83 (0.22) ***	-0.50 (0.21) *	-1.05 (0.22) ***
Proportion non-EU inhabitants/1000	-0.15 (0.05) **	-0.11 (0.05) *	-0.19 (0.05) **
Deprivation			
Mean income level	-1.05 (0.36) **	-0.92 (0.31) **	-1.47 (0.37) ***
Rural/Urban			
Population density (ln)	0.01 (1.31)	1.58 (1.28)	0.96 (1.50)
Population density (ln) squared	-1.87 (0.62) **	-1.14 (0.59)	-2.32 (0.68) **
Population density (ln) cubed	-1.10 (0.41) **	-0.66 (0.44)	-1.42 (0.46) **
Control composition effect			
Proportion 65 +	0.48 (0.10) ***	0.36 (0.08) ***	0.62 (0.10) ***
Contagion effect			
Spatial lag	0.25 (0.07) ***	0.15 (0.07) *	0.23 (0.06) ***
Squared correlation	.314	.204	.366
Log Likelihood	-1075.8414	-1050.3792	-1103.9094

Note. Entries are the result of a spatial lag regression, performed with tools for spatial data analysis in Stata written by Pisati (2001). The municipality of Voeren (6355 inhabitants) had to be excluded because it does not have a border with any other Flemish municipality. A two-tailed z-test was used to test significance
* p<.05 ** p<.01 *** p<.001

The model is quite powerful, with an explained variance of 31 percent for men, 20 percent for women and 36 percent for the total rate. The strongest community level determinant of suicide rates is the proportion of single households in a community. A community with a higher proportion of single households has significantly higher suicide rates than one would expect based on the age-specific suicide rates, both for women as for men. This illustrates that a community with less dense networks of social support among its inhabitants has a significant chance to record higher suicide rates. A concentration of older inhabitants, too, has a positive effect on suicide rates. We point out here that the dependent (*standardized* mortality rates) is already controlled for age specific suicide rates, so that the effect we observe here is not a compositional effect but a concentration effect. Municipalities with a higher proportion of older inhabitants have higher suicide risks for all the age-groups.

Furthermore, we can observe that population growth in the form of immigration towards the community has a strong negative impact on suicide rates. Both immigration from within the country as from outside the country are negatively related with suicide rates for men, for women only the foreign immigration has a significant negative effect. The proportion of

inhabitants that do not have the nationality of one of the 15 original European Union member states also has a significant negative impact on suicide rates. These findings contradict the findings of earlier research, suggesting a positive relation between migration and suicide rates. A possible explanation for this negative relation is that migrants commit less suicide and hence through their presence they lower the aggregate suicide rate. It is a well-established fact that migrants retain the suicide level of their home country (Sainsbury & Barraclough, 1968), so this compositional effect is quite plausible for non European presence and external immigration, since most non-European inhabitants and a large part of the external immigrants have Turkish and Moroccan origins. The largest group of external immigrants is from the Netherlands, which, just as Turkey and Morocco, has significantly lower suicide rates. For internal migration, we can imagine a similar mechanism, namely that people migrating within Belgium are less prone to suicide, since they are wealthier and do not tend to be single. A second, more contextual, explanation is that places that attract migrants have a vibrant and attractive social life, functioning as a buffer against suicide rates. The opposite phenomenon, an area where more inhabitants are leaving than arriving, certainly seems a fertile ground for higher suicide rates. A higher mean income lowers suicide rates. This illustrates that controlling for social integration, deprivation still plays a role, even in countries with a generous social security system such as Belgium. The relation with population density is nonlinear for men, since both the squared and cubic term are significant. The cubic relation means that in densely populated areas of the region, with more than 600 inhabitants/km², suicide rates are significantly lower, while in sparsely populated areas, with less than 100 inhabitants/km², suicide rates are significantly higher, and in between they are relatively constant. Religious participation has no effect at all at the community level.[13]

Comparing suicide rates for women and for men, we can observe that most community characteristics have a similar direction, but the effects are weaker for women than for men.

[13] When a one-tailed significance test is used, the degree of religious participation is significant ($p<.05$) for male and total suicide rates, but for comparative purposes we adhere to statistical standards and interpret two-tailed significance tests.

4.6 Discussion

The current analysis investigates the occurrence of significant community level differences in suicide rates in Belgium. It has to be observed that the smoothed standardized suicide mortality rates differ from 77 to 134, suggesting a considerable amount of inter-community variance. With a squared correlation of 20 to 36 percent, our models are able to explain a substantial part of that variance. This by itself suggests that communities have an impact on suicidal behavior, which is often overlooked in policy programs aimed at preventing suicide. Most importantly, suicide rates tend to be higher in communities with higher proportions of single households, an older population and a negative net migration. All these elements together indicate a higher risk for social isolation, which is a fertile ground for suicidal behavior. It has to be noted that in the analysis we control for the variables that might be responsible for explaining a positive migration balance, like income levels. Two complementary explanations can be formulated, and merit further investigation. A first plausible explanation is that the higher suicide rates are due to compositional differences in the population. Because migrants, and households that are not single, have characteristics that lower their chances towards suicidal behavior, on an aggregate level cities where these groups are more prevalent have lower suicide rates. A second and partly documented effect is a concentration effect. Communities with a large proportion of elderly, have a higher suicide rate than we would expect on age specific suicide rates alone. This means that the presence of a high proportion of elderly increases the suicide rate in total. In other words, the composition of a community translates itself into a less tangible but pervasive climate that influences suicide rates indirectly. The fact that the presence of an older population has such a strong effect might be related to feelings of 'burdensomeness' that is considered as a main determinant of suicide (Joiner, 2005).

Contrary to other research, the degree of religious involvement of a community had no effects. This means that in the highly secularized Flemish region, religious involvement does not seem to matter anymore for suicide rates, if adequate controls are used, although it has to be noted that the effect of this variable comes close to significance. The literature also suggested a relation between the urban character of a community and the suicide rate, although hypotheses on the direction of the impact of urbanity differed. The current analysis, on one of the most densely populated regions in Europe, finds no significant impact for women, but lower suicide rates in densely population communities for men. In this analysis, we did not rely on composite indicators, but rather on distinct variables. This allowed us to

observe that the relation with migration and diversity is exactly the opposite of what is usually assumed in the literature. Diverse communities with high levels of immigration actually have lower suicide rates, and this might be due both to composition effects (i.e., lower suicide rates among ethnic minorities) as by concentration effects (the fact that immigration signifies an attractive community). The current analysis suggests that community characteristics should be included in policies aimed at reducing suicide rates. Especially communities with older and isolated population should be targeted in suicide prevention. It would be highly relevant to test if these community levels effects hold, if individual information on victims of suicidal behavior is added. Only access to this kind of data, can determine in a convincing manner whether the relations we found in this study are due to composition or concentration effects.

A last point is that, especially when looking at male suicide rates, a moderate contagion effect among neighboring communities is present. This means that the suicide rate of a community is not only determined by endogenous factors, but also by the suicide rates in nearby communities. One of the elements in this regard might be that in regions with high suicide levels, the cultural acceptance of suicide is also higher. Although it is not clear what the mechanism behind this spatial influence is, it underlines that context, here seen both as municipality of residence and the neighboring municipalities, all contribute to circumstances that can facilitate or prevent suicide.

Chapter 5

Unemployment, Inequality, Poverty and Crime Spatial Distribution Patterns of Criminal Acts in Belgium, 2001-2006

Abstract

Previous research has indicated that various deprivation indicators have a positive impact on crime rates at the community level. In this article we investigate the impact of deprivation indicators on crime in Belgian municipalities (n=589) for the period 2001-2006. A spatial regression analysis demonstrates that unemployment figures have a strong and significant impact on crime rates, and this effect is stronger than the effect of income levels. Income inequality has a significant positive impact on property crime rates but a negative impact on violent crime. Crime is heavily concentrated in the urban centers of Belgium, but we also observe some important regional variations. Demographic structure was not related to crime levels, while spatial analysis shows there is a spill-over effect to neighboring communities for property crime, but not for violent crime. We close with some theoretical and policy considerations on the relation between unemployment and crime.

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5.1 Introduction

Investigating spatial distribution patterns of crime is a continuing concern within criminology. Traditionally, it has been argued that economic deprivation and inequality are positively correlated to crime rates (Blau & Blau, 1982; Messner, 1982; O'Brien, 1983; Williams, 1984; Sampson, 1985a). A concentration of poverty, a lack of resources, and various indicators for social disorganization have all been invoked to explain a concentration of crime. Both from a theoretical as from a policy perspective, it is of crucial importance to determine in a more precise and reliable manner what kind of community characteristics have an effect on specific crime rates. The effort to determine what specific indicators of poverty, exclusion or inequality have the strongest impact on crime rates is hampered by the fact that most data thus far have been collected for specific areas in the United States or the United Kingdom. Most of the existing research is concentrated on metropolitan areas, and there are not that many studies available on rural crime (see, however Bouffard & Muftic, 2006; Osgood & Chambers, 2000). Although most of the available data suggest that at least some forms of crime are heavily concentrated in urban areas, it is clear that if one wants to achieve a comprehensive understanding of the geographical distribution of all forms of crime, it is crucial to take into account crime data covering an entire territory, and not just one specific urban setting.

In this study we offer new evidence on the relation between deprivation, inequality and crime, based on nationally collected crime figures in Belgium. Since the year 2001, the Belgian federal police collects these data in a uniform manner, which allows us to test the impact of economic indicators on crime rates at the community level. More specifically we want to investigate whether unemployment, inequality or poverty can be regarded as the strongest predictor for crime rates. Our hypothesis in this analysis is that inequality has a stronger effect on crime rates than income levels (Blau & Blau, 1982). We also pay special attention to the effects of unemployment. The experience of unemployment leads to a loss of income and thus to an increased risk of poverty, but simultaneously various studies have demonstrated other negative outcomes, like a weakening of social relations, a feeling of social isolation and the loss of a socially meaningful role in society (Lin, 2008). High unemployment rates also provide incentives to perform all kinds of criminal acts (Arvanites & Defina, 2006). Given all these negative consequences, it can be assumed that unemployment has a strong effect on crime, over and above the effect of poverty and inequality. While previous studies have shown that unemployment is positively associated with crime in countries with a conservative

social security system (and thus restrictive rules on unemployment allocations), there is less evidence available on the effect of unemployment in countries with a more generous social security system. Since Belgium clearly belongs to this latter category (e.g., unemployment benefits are not restricted in time), we can assume that the Belgian data are especially relevant in this regard. If, even in a generous social security system like the Belgian system, unemployment would have a strong effect on crime, this would suggest that the experience of unemployment cannot be reduced to the effects of a substantial loss of income. Investigating the spatial distribution of crime in Belgium therefore allows us to shed new light on the ongoing theoretical discussion about the relation between unemployment and crime.

In this article, we first review the literature on the relation between economic deprivation, inequality and crime, before presenting our data and methods. Subsequently we include a section on data and the appropriate model specification, before turning to the results of the analysis. We close with some observations on the implications of our findings for the study of the spatial distribution of criminal acts.

5.2 Deprivation and unemployment

The study of the spatial distribution of crime rates can be seen as one of the oldest research questions within criminology (Pratt & Cullen, 2005). Already since the early days of the Chicago school, a concentration of economic disadvantage indicators was assumed to be a key element in the occurrence of crime (Park & Burgess, 1924; Shaw & McKay, 1942). In addition, in more recent research efforts various authors have claimed that the quality of neighborhood relations can be a key factor in explaining the concentration of crime and delinquency (Sampson, Raudenbush & Earls, 1997). This line of research has clearly established that there tends to be a positive correlation between deprivation and crime rates. Within the literature, however, there is an ongoing dispute on the question what specific aspects of deprivation have the strongest effect on crime. It is clear, however, that in the study on the social ecology of crime, a distinction has to be made between different types of crime. Usually, a general distinction is made between property crimes, which are offences against the property of a person or household, and violent crimes, which are offences against the physical integrity of a person. This theoretical distinction is partly motivated by the fact that different structural and social conditions are responsible for the unequal spatial distribution of both types of crime. Property crimes are often associated with a high level of relative

deprivation, while violent crimes are associated with high levels of population density (Field, 1990; Wilkinson, Kawachi & Kennedy, 1998). In this review of the literature, we very briefly summarize the main strands in this line of research for both types of crime.

In most of the literature, a positive correlation is suggested between poverty and violent crime rates. This relation has been demonstrated for assault (Harries, 1976; Crutchfield, Geerken & Gove, 1982) and robbery (Sampson & Groves, 1989). In the United States, homicide too, has been found to be concentrated in poor regions, but this finding has not been repeated outside a US context (Kposowa, Breault & Harrison, 1995; Kovandzic, Vieraitis & Yeisley, 1998; Messner 2001; McCall and Nieuwbeerta, 2007; Pridemore 2008).
Despite these findings, there is still an ongoing controversy about the nature of the causal relations involved (Rosenfeld & Fornango, 2007). Patterson (1991) has claimed that the relation between poverty and crime rates should be considered as spurious: once adequate control variables are taken into account, there is no longer a significant relation between poverty and the occurrence of homicide, forcible rape or aggravated assault rates. Crutchfield et al. (1982), Messner (1983) and Sampson (1985b) question the positive relation between poverty and homicide, as they observe lower homicide rates in poor areas.

While there is some disagreement about the relation between poverty and violent crime, the evidence with regard to the relation between poverty and property crime is more consistent. All major studies demonstrate a positive relation between poverty levels and official rates of burglary, theft and motor vehicle theft (Sampson & Groves, 1989; Kposowa et al. 1995; Ohlemacher, 1995; Hope, 2001; Hope, Bryan, Trickett & Osborn, 2001; Edmark, 2005; Oh, 2005). In most studies it can be observed that people in poorer areas suffer property crime most heavily (Trickett, Osborn, Seymour & Pease, 1992; Trickett, Osborn & Ellingworth, 1995; Osborn, Ellingworth, Hope & Trickett, 1996; Ellingworth, Hope, Osborn, Trickett & Pease, 1997; Osborn & Tseloni, 1998; Tseloni, Osborn, Trickett & Pease, 2002). While residents of affluent neighborhoods have means at their disposal to protect themselves from property crime, residents from poor neighborhoods cannot afford this kind of private protection (Hope, 2000).

Not only poverty is assumed to have an effect on crime rates, but also economic inequality. It can be argued that a strong degree of inequality between population groups leads to (feelings of) deprivation, or simply implies more opportunities for various forms of crime (Blau &

Blau, 1982; Wilson, 1987). Deprivation theory assumes that high levels of inequality will lead to feelings of aversion, jealousy and anger among groups with low levels of resources (Neckerman & Torche, 2007). As Blau and Blau (1982, p.121-122) summarize the argument: "Income inequality in a metropolis substantially raises its rate of criminal violence. Once economic inequality is controlled for, the positive relationship between poverty and criminal violence disappears. … Apparently the relative deprivation produced by much inequality rather than the absolute deprivation produced by much poverty provides the most fertile soil for criminal violence".

Both for violent crime as for property crime, studies have been able to demonstrate a positive relation between income inequality in a community and crime rates (Kennedy et al., 1998; Kawachi, Kennedy & Wilkinson, 1999; Fajnzylber, Lederman & Loayza, 2002; Fowles & Merva, 1996). Furthermore, it is assumed that feelings of aversion and deprivation will lead more easily to the occurrence of property crimes such as burglary and larceny (Deutsch, Spiegel & Templeman, 1992; Chiu & Madden, 1998; Kawachi et al., 1999). The relation has also been confirmed for homicide, although it should be noted that most of this evidence originates from US based research (Simpson, 1985; Rosenfeld, 1986; Sampson, 1986; Kennedy et al., 1998; Kovandzic et al., 1998; Fajnzylber et al., 2002; Pratt & Godsey, 2003; Pickett, Mookherjee, & Wilkinson, 2005; Chamlin & Cochran, 2006; Jacobs & Richardson, 2008). Only a limited number of studies question this positive relation between income inequality and crime rates (Land et al., 1990; Kennedy et al., 1998; Lee & Bankston, 1999; Neumayer, 2005). Therefore we can conclude that from the literature we can expect a significant positive relation between both violent and property crime and economic inequality.

Within the recent literature, there is a quite intensive debate on the role of unemployment in explaining crime rates. Raphael and Winter-Ebmer (2001) have argued that unemployment is the main driving force behind the relation between (relative) poverty and property crime. Unemployment implies that actors will be more inclined towards a criminal career, while they are also structurally available for non-legal forms of activity. High unemployment rates among specific groups in society might also be associated with social alienation and feelings of envy. In a recent article, Lin (2008) relies on new statistical methods to argue that the effect of unemployment on property crime rates is much larger than was earlier assumed. Both studies do not find effects of unemployment on violent crime rates.

The fact that we find strong relations between poverty indicators and crime rates does not inform us yet about the causal mechanism that might be responsible for this relation. As Sampson (2002, p.216) argues, the central question is: "Why does concentrated poverty, which is after all the concentration of poor *people*, matter?" We can assume that economic disadvantage and social exclusion have a harmful impact on the social organization of a community, as they erode networks of solidarity and trust (Sampson & Morenoff, 2004). These processes, in turn, reduce the collective efficacy of a local community as they prevent the community from maintaining a high level of social control. The available data for the Belgian case do not allow us to fully investigate these causal mechanisms. The police records that we will rely on only contain information on the place where the crime took place, not about the place where the perpetrator (if known) resides. Since we lack information on who committed the crime, we should proceed very carefully in constructing a causal claim. If one, for example, finds a positive relation between crime rates and poverty, this does not imply yet that poverty leads to criminal behavior on the individual level. Another possibility is that poor groups of the population are structurally vulnerable for victimization, whether these acts are committed by fellow inhabitants of the community, or by others as has been illustrated by the results of the British Crime Survey (e.g. Trickett, Osborn, & Ellingworth, 1995; Hope, 2001). For the time being, we will limit ourselves to the analysis of the relation between economic indicators and crime rates, without further speculation on the causal mechanism that might be involved. By relying on national community level data, including both urban and rural areas, our aim is to arrive at a more comprehensive understanding of the spatial distribution of criminal acts, with an emphasis on the effects of poverty, inequality and unemployment.

5.3 Hypotheses

This overview of the literature allows us to derive a number of hypotheses. More specifically we will address the concern that high levels of poverty, unemployment and income inequality are responsible for high crime levels, also in a context with a rather generous social security system.

The hypotheses to be tested in this article are rather straightforward:

H1: Property crime rates will be higher in communities with high levels of poverty.

H2: Both violent and property crime rates will be higher in communities with high levels of income inequality.

H3: Property crime rates will be higher in communities with high unemployment figures.

All three hypotheses will be tested in order to assess which one of these three independent variables (poverty, income inequality or unemployment) is most strongly associated with the level of reported crime acts within a community.

5.4 Data and methods

In this article we rely on crime data for the entire territory of Belgium for the period 2001-2006. Although the number of unreported or unregistered crime remains a crucial problem in any analysis of crime rates (Tarling & Morris, 2010), we can be confident that these data offer a reliable image of registered crime in Belgium. Although we have to be extremely cautious in comparing crime rates across countries, there is no indication that Belgium would offer an exceptional case, compared to other countries in Western Europe (Newman, 1999)

Since 2001 a uniform crime recording protocol has been used by the Belgian police force, and this has led to a reliable measurement of registered crime in the country. Since we want to determine a more general pattern and in order to cancel out yearly fluctuations we opt for a six-year average (2001-2006) as a dependent variable.[14] Belgium is a relatively small country in Western Europe, with a population of 10,540,000 inhabitants. The country is divided into 589 municipalities, with on average 17,900 inhabitants (median value: 11,500). The municipality, therefore, can be considered not only as a relevant political and administrative unit, we can also claim that the average scale of a municipality still allows for a feeling of 'community' among the inhabitants of that municipality. The general assumption in this line of research is that the geographical unit should be as small as possible (Weisburd, Bernasco & Bruinsma, 2009), and in this specific case, the municipality is the smallest geographical unit

[14] It has to be observed that correlations over the years are very strong (ranging from .86 to .93 for property crime and from .73 to .89 for violent crime), indicating that differences between municipalities remain very stable over the six observation years.

for which reliable data are available. Most studies on the spatial distribution of crime focus only on metropolitan or urban areas. Since our data were collected across the entire territory of a country, we have access to data from both rural and urban areas. Rural crime is generally understudied in criminology, but it is safe to assume that crime rates will be dramatically lower in rural areas than in the urban regions of Belgium (Hardyns, 2010; Wells & Weisheit, 2004).

In line with the literature, we will introduce a distinction between violent crime and property crime (Wikström, 1991; Byrne, 1986). Since homicide levels are rather low in Belgium, this form of crime had to be excluded from the analysis.[15] In the Belgian police records, and in accordance with the Belgian criminal code, violent crime refers to the acts of 'intentional assault and battery' and 'destruction and damaging'. Property crime refers to theft from motor vehicles, stealing motor vehicles, 'vandalism' (whether aimed at cars or other material goods) and burglary. Although these two crime measurements are correlated, both theoretically and empirically, it makes sense to distinguish them in the analysis. It is believed that these different kinds of crimes will have different patterns of geographical concentration (Byrne, 1986; Field, 1990; Kawachi et al., 1999; Wilkinson et al., 1998).

While the police records only contain information on the absolute number of these offences, for our analysis we constructed crime rates for every municipality, which are calculated as:

$$CR_{ti} = [a_{ti} / u_{ti}]*1000,$$

where *CR* is the crime rate, *t* is the year, *i* the municipality, *a* is the number of crimes recorded and *u* is the population of the municipality.

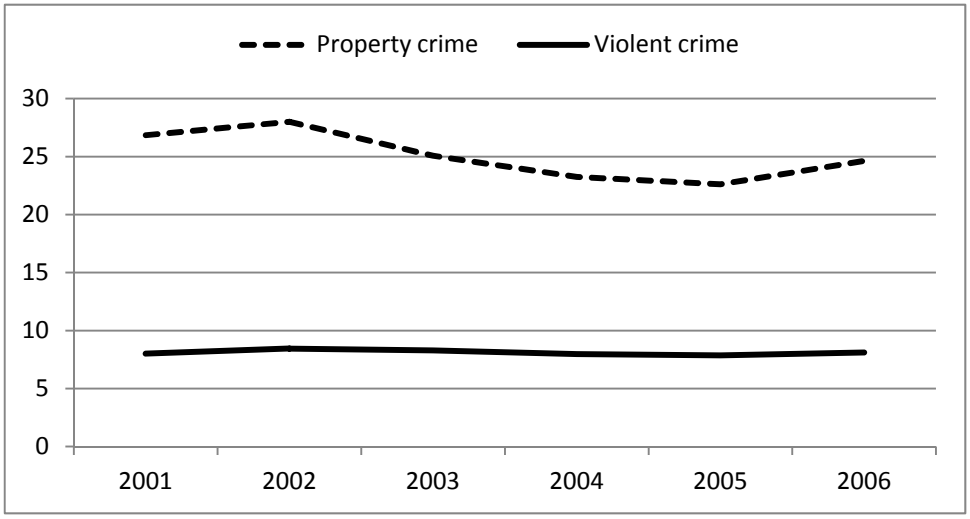
At this moment, data are available for the years 2001 to 2006. Since we have only six observations, we cannot conduct a reliable trend analysis. We use the averaged annual crime rate for every municipality over this period. For every single year the crime rate has been calculated using the population figure for that specific year.

Figure 5.11 illustrates the evolution of the mean of different crime rates on the country level across the observation period. The violent crime rate proves to be relatively stable with on

[15] Basically, the number of homicides is ca. 300/year, while there are 589 communities. There are too many empty cells therefore to conduct a meaningful analysis.

average eight crimes registered per 1,000 inhabitants. Property crime rates on the other hand seem to have dropped slightly from on average 28 crimes per 1,000 inhabitants in 2002 to around 22 property crimes per 1,000 inhabitants. The explanation for this trend is a substantial reduction in motor vehicle theft and theft from motor vehicles in the areas where these crimes were most prevalent. The correlation between the yearly observations at the municipality level is very high (well above 0.73 for all types of crime), indicating that areas with high crime rates in one observation year also had high rates in the other years. This makes us confident that analyzing the six year average makes it possible to make robust and reliable conclusions on the occurrence of both types of crime. This also allows us to reach more robust conclusion, since we can eliminate the possibility that our results would be influenced by yearly random fluctuations.

Figure 5.1 Evolution of Crime Rates in Belgium, 2001-2006

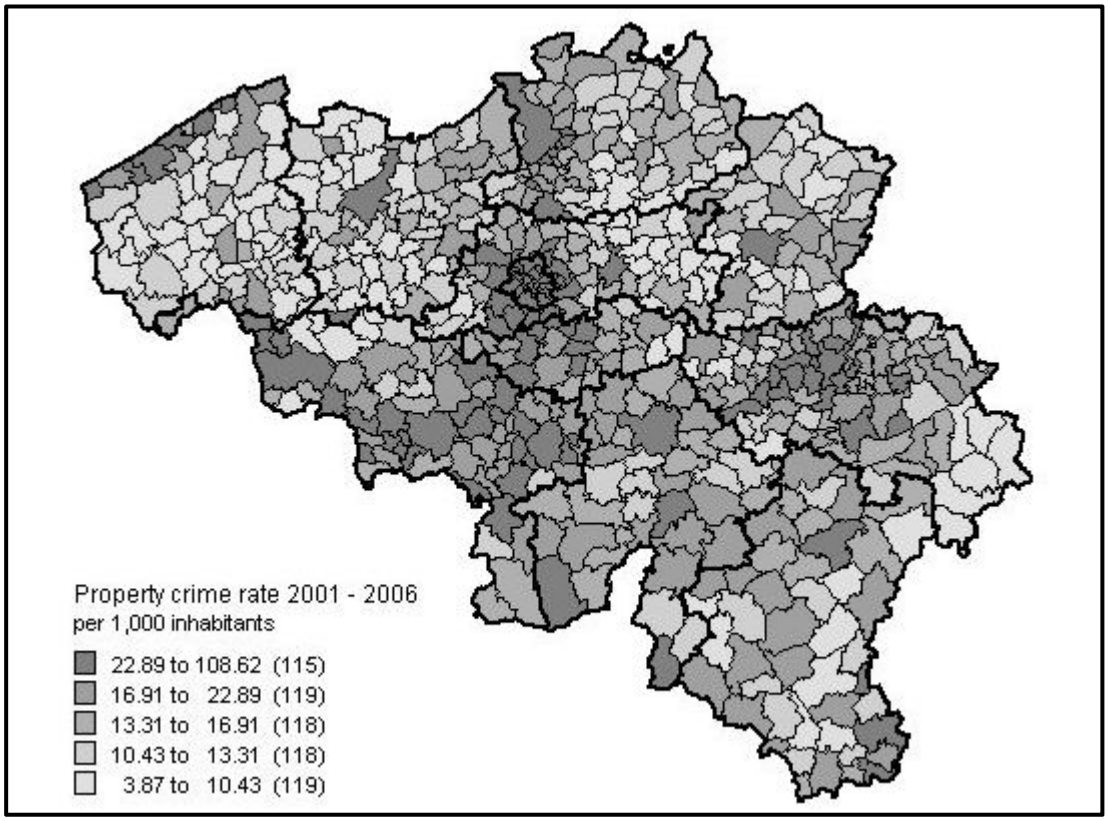


Reported and registered crimes in Belgium, 2001-2006/1,000 inhabitants. Source: Belgian Federal Police, Operational Police Information.

To explain differences at the local level, some variance in crime rates is needed. If we plot the average property crime rate for the period 2001-2006 on a map of the Belgian municipalities (Figure 5.2), we can observe strong variations. The highest rates are recorded in the central area of the capital Brussels, with also high rates in the area reaching north to the port of Antwerp, south to the city of Charleroi and east to the city of Liège. The rural areas in the north east and the north west of the country, on the other hand, typically show low rates of property crime.

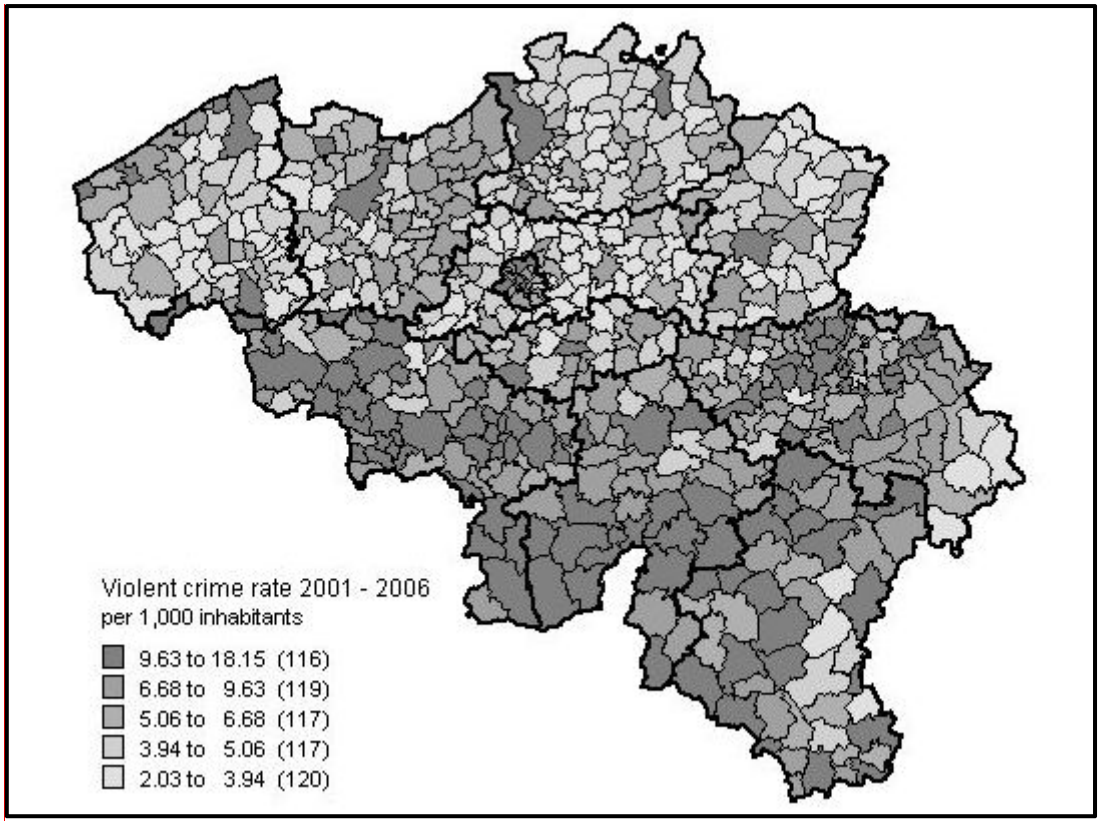
For violent crime rates, the pattern of spatial distribution is different (Figure 5.3). Again, we find the highest rates in the main cities, but contrary to property crime, these high figures do not seem clustered in the central urban area of Belgium. Violent crime also occurs more often in the rather rural municipalities of the southern, French-speaking part of the country. The municipalities in the upper north western part of the country are all seaside resorts, lining the North Sea coast. During the summer season the original population of these municipalities is almost doubled by the influx of tourists, and this could partly explain the very high figures recorded in these municipalities.

Figure 5.2 Spatial Distribution of Property Crime (2001-2006)



Note: Property crime rates, averages 2001-2006 for 589 Belgian municipalities, divided in five equal groups.
Source: Belgian Federal Police, Operational police information. Entries: number recorded acts/1000 inhabitants.

Figure 5.3 Spatial Distribution of Violent Crime (2001-2006)



Note: Violent crime rates, averages 2001-2006 for 589 Belgian municipalities, divided in five equal groups.
Source: Belgian Federal Police, Operational police information. Entries recorded crime rates/1000 inhabitants.

5.5 Operationalization

After this first descriptive exploration of the data, we will document the variables that will be used to explain these local differences in crime rates.

As dependent variables, we include the natural log of the property crime rate and the violent crime rate. We use a transformed form of the crime rates, since the original data are not normally distributed and normality of the data is a basic assumption for both ordinary least squares and spatial regression. This transformation is commonly used in analyses of crime rates.

For the independent variables, we will include both absolute and relative economic deprivation indicators. Within the literature there is some controversy on how poverty or income levels can best be measured (Brady, 2003). For poverty, we use data from the Belgian tax administration, documenting the median fiscal income in a municipality, averaged for the period 2001-2006. Again, it should be noted that there is a considerable degree of variance in

these figures, ranging from a median income of 15,080 euro to 26,000 euro per inhabitant per year. In this study, we use the natural log of *median* income in the municipality as an indicator for income. In other models, we included the natural log of *average* income as an independent variable, but this did not lead to substantially different results.

For income inequality, we relied on the same fiscal income data that also include a measurement of income variation within the municipality. For every municipality a Gini coefficient was constructed (again averaged for the 2001-2006 period) indicating (in)equalities in the distribution of income in the community. The Gini coefficient is chosen as a measure of income inequality, since it provides an overall estimate of income inequality. It summarizes what proportion of the population gains what proportion of the total income (Lynch et al., 2001). The Gini coefficient can range between 0.00 (everyone in the population has exactly the same income) and 1.00 (one person earns 100 percent of the income in the community) (Stuart & Ord, 1994).

For both income indicators it should be noted that figures are obtained from the fiscal administration, and therefore they do not include the grey economy which remains completely undocumented in Belgium.
Finally, we also include the unemployment rate in the municipality. The unemployment rate is provided by the Federal Government Department of Economics, and is expressed as the number of unemployed divided by the total labor force (average 2001-2006).

We also rely on a number of control variables. Because the age-crime relationship is an almost universal finding in criminological literature, different types of crime are frequently explained by the age structure of a community (Sampson & Wooldredge, 1987; Steffensmeier, Allen, Harer & Streifel, 1989; Nagin & Land, 1993; Allen, 1996; Tseloni, Osborn, Trickett & Pease, 2002). With regard to demographics, we include the percentage of young inhabitants, defined as the proportion of inhabitants between 15 and 24 years old, as a control variable.[16]

[16] In line with the literature we defined young as the 15-24 age group. Other cut-off points were tried but did not yield to different results. Theoretically, we could also have included the gender balance as we can assume that men are more prone to violent crime than women are. However, the gender balance is almost equal in most of the localities, and this made the analysis meaningless.

The geographical presentation of crime rates in Figures 2 and 3 indicates that tourist resorts might play a rather idiosyncratic role in this regard, with exceptionally high crime rates. On the one hand, this could be considered as a measurement error, since the real number of residents of these resorts during the summer season is much higher than the official population figure used to calculate crime rates. On the other hand, it has also been shown that tourism as such is related to crime (Pizam, 1982; Prideaux, 1996; Schiebler, Crotts & Hollinger, 1996; Walmsley, Boskovic & Pigram, 1983). Again, we do not know who commits the criminal acts, so we do not know whether tourists themselves are associated with some forms of criminal behavior (e.g., gambling or drugs-related), or whether they are available as potential victims for various forms of criminal behavior (Giacopassi & Stitt, 1993). Furthermore, mass tourism might be associated with a disruption of the local social fabric, reducing the level of collective empowerment of the community (Park & Stokowski, 2009). In any case, it is important that we control for the presence of tourists, and therefore the total number of nights spent in hotels, bed and breakfast establishments and camping sites will be included as a control variable. This information is derived from the National Institute of Statistics, collecting data on tourism-associated economic activity.

Urbanization is generally seen as a factor strongly related to crime. In the classical literature, urbanization has been associated with social disintegration and consequently a proportional increase in crime according to the level of urbanization is expected (Wirth, 1938; Christiansen, 1970). One of the most common operationalizations of urbanization is population density, or the number of inhabitants divided by the size of the municipality.

A part of the literature suggests that the presence of foreigners, too, will be associated with high levels of crime (Valier, 2003). Although by no means this relation should be taken as having been firmly established (Sampson, 2008), we still considered it safe to include the (natural log of) the percentage of foreigners in the population as a control variable in our models.

Finally, Belgium is a federal country, with strong autonomous regions (Deschouwer, 2009). Although crime and justice are federal responsibilities, various initiatives that might have an effect on crime prevention are dealt with differently at the regional level. To control for the possible effect of regional policy differences, we included a dummy variable to indicate

whether the municipality belongs to the Walloon, the Brussels or the Flemish autonomous region of Belgium.

5.6 Methods

The level of analysis is the municipality (n=589). Not only is this level sufficiently small to assume that a municipality still reflects a real community, one should also keep in mind that local mayors have some authority on police policy in their municipality. As such, the municipality can be seen as a natural and the smallest possible entity for this form of analysis. This means that our analysis only allows us to reach conclusions at the municipality level, and we cannot make any statement about the individual level. In other words, we are looking at the indicators of contexts in which crime takes place more or less often, and not at the characteristics of criminals. While it might be preferable to investigate even smaller geographical units like neighborhoods or even streets, reliable and comprehensive information on this level is simply not available for the Belgian context.

To take account of the spatial nature of the data, spatial regression techniques will be used to analyze the data. This is necessary, since it is possible and even likely that the standard assumption of the independence of observations, or the independence of error terms, needed for ordinary least squares (OLS) regression, are violated (Anselin, 1988). This means that the coefficients or the standard errors can be biased, which renders the parameters of an OLS regression model less reliable.

Two forms of spatial models are commonly used to improve regressions on spatially correlated data. Theoretically, these two forms of spatial interdependence have a different interpretation. If two municipalities are adjacent, the crime rate of the first can be influenced by the crime rate of the other. This means that there is a contagion or dispersion effect of crime, represented best by a spatial lag model.[17] If the error residuals of the municipalities are influenced by one another, this substantively means that the phenomenon under study is not analyzed at the correct geographical level, or that there might be an unobserved variable

[17] In its structural form, a spatial lag regression equation reads as $Y = \rho WY + X\beta + \varepsilon$, with ε ~N(0,Ω) and Y as the outcome, ρWY as the spatial lag component, $X\beta$ as the independent variables and ε as the error term. The spatial lag component is composed of a spatial coefficient ρ and a row standardised spatial weights matrix (W), in our case a first order queen contiguity matrix, capturing the geographical structure of our observations

correlated with the spatial structure of the data. This would imply a clustering effect (for some unknown or unobserved reason municipalities resemble one another) and this has to be studied by a spatial error model (Anselin, 1988; 1994).[18] A spatial lag model therefore is appropriate if neighboring municipalities influence one another; the spatial error model documents that municipalities geographically cluster but for an unknown reason.

It is impossible to fully specify a model with both a spatial lag and spatial error component, so a choice between a spatial lag and spatial error model has to be made. A robust Langrange Multiplier test on the residuals of a non-spatial ordinary least squares regression is used to determine the best specification of the spatial regression model: spatial lag or spatial error (Anselin et al., 1996).

The first step to be taken therefore is to compute Langrange multiplier tests on the residuals of a nonspatial ordinary least squares regression model. While in the case of property crime, a spatial lag model was clearly preferred over a spatial error model, for violent crime a spatial error model was more appropriate. This means that property crime in one municipality is influenced by the crime levels of the neighboring municipalities, where violent crime tends to cluster in zones larger than a municipality.
On a final methodological note it has to be added, that since unemployment and median income are strongly correlated, we will run separate models with these variables to prevent multi-collinearity.

5.7 Results

5.7.1 Property crime rates

First we analyzed the geographical distribution of property crime rates. In the first model (Table 5.1), we included the median income of the community. In line with our hypotheses we did observe a negative impact of income levels and a positive effect of income inequality.

[18] The structural form of the spatial error regression is $Y = X\beta + \lambda W\varepsilon + \mu$, with μ ~N(0,Ω) and Y as the outcome, $X\beta$ as the independent variables, $\lambda W\varepsilon$ as the spatial error component and μ as the homoscedastic error term. The spatial error component is composed of a spatial coefficient λ and a row standardised spatial weights matrix (W), in our case a first order queen contiguity matrix, capturing the geographical structure of our observations.

There was no effect of the proportion of young people in the population, but a modest influence of the share of foreigners. We also observed that crime rates are much higher in urban areas (as expressed by population density), and in touristic areas. Controlling for these influences, crime rates are lower in both the Flemish and Brussels regions than in the Walloon region. In Model II, median income was replaced by the unemployment level and it is clear that unemployment has a stronger impact than median income. Including unemployment levels also sharply reduces the significance level of the variable for the region. We also note that the presence of foreigners, and touristic activity, were less important to explain property crime in this model. All other control variables remained more or less in place, or became slightly weaker. The spatial lag coefficient rho was moderately strong and positive, indicating a contagion mechanism in terms of property crime. Property crime rates spill over into neighboring communities. Furthermore, and in line with our hypotheses, unemployment, inequality and income levels were all related to property crime.

Table 5.1 Spatial lag regression of Property Crime Rates in Belgian Municipalities

	Model I	Model II
	Coefficient (S.E.)	Coefficient (S.E.)
Constant	9.174(1.478)***	-0.442(0.270)
Median income (log)	-0.770(0.154)**	
Gini coefficient inequality	2.263 (0.502)***	2.921(0.470)***
Unemployment rate(log)		0.347(0.040)***
Young people proportion	-0.062(1.140)	0.438(1.095)
Non nationals rate (log)	0.062(0.017)***	0.036(0.017)*
Population density (log)	0.208(0.016)***	0.181(0.015)***
Touristic activity (Ref. low)		
Middle	0.097(0.029)**	0.067(0.027)*
High	0.185(0.027)***	0.162(0.027)***
Region (Ref. Walloon)		
Flemish region	-0.274 (0.034)***	-0.046(0.044) ns
Brussels region	-0.337(0.082)***	-0.225(0.079)**
Spatial multiplier (rho)	0. 396(0.040)***	0.342(0.040)***
Squared Correlation	.709	.731

Note. N=589.Entries are result of a spatial regression analysis at the level of the municipality. Dependent variable: natural log of property crime rates, 2001-2006. Sign. : *<.05; **<.01; ***<.001.

5.7.2 Violent crime rates

When turning to the violent crime rates (Table 5.2), we observed again that median income level had a strong and significant negative effect on crime rates. Rather surprisingly, we find a negative relation between income inequality and violent crime rates. Urban communities have higher crimes, and the same goes for tourist resorts. The proportion of non-nationals in the population did not have a significant relation with violent crime. Furthermore, we can observe there was no effect of the demographic structure. Violent crime rates tended to be higher in the Walloon region, compared to the Brussels and Flanders region, although the difference between Wallonia and Flanders was rendered weaker if we take unemployment into account. It has to be noted that the absolute violent crime rates do tend to be highest in the Brussels region, but taking into account the high degree of urbanization, unemployment and tourist activity the violent crime rates are lower than could be expect, leading to a negative coefficient of the Brussels dummy variable. Including unemployment rate rather than income level again led to a strengthening of the model, and it weakened most other variables included in the analysis. Violent crime is less contagious among municipalities, as not a spatial lag but a spatial error model had to be preferred. This means that rather than spilling over, if it comes to violent crime rates there seem to be certain regions, composed of a number of municipalities, with high rates. Unemployment rates and median income levels again were strong determinants of violent crime rates – a finding that was not predicted by the literature. Income inequality played a rather small role in explaining violent crime.

Table 5.2 Spatial error regression of Violent Crime Rates in Belgian Municipalities

	Model I	Model II
	Coefficient (S.E.)	Coefficient (S.E.)
Constant	22.325(1.807)***	0.581(0.289)*
Median income (log)	-1.990(0.190)***	
Gini coefficient inequality	-1.498(0.586)*	-1.605(0.527)**
Unemployment rate(log)		0.691(0.047)***
Young people proportion	0.641(1.311)	1.157(1.209)
Non nationals rate (log)	-0.007(0.023)	-0.036(0.022)
Population density (log)	0.198(0.019)***	0.131(0.018)***
Touristic activity (Ref. low)		
Middle	0.129(0.029)***	0.102(0.027)***
High	0.199(0.031)***	0.175(0.029)***
Region (Ref. Walloon)		
Flemish region	-0.555(0.046)***	-0.120(0.056)*
Brussels region	-0.671(0.113)***	-0.482(0.108)***
Spatial multiplier (lambda)	0.491(0.053)***	0.511(0.051)***
Squared Correlation	.615	.664

Note. . N=589. Entries are result of a spatial regression analysis at the level of the municipality. Dependent variable: natural log of violent crime rates, 2001-2006 Sign. : *p<.05; **p<.01; ***p<.001.

5.8 Discussion

In the current article, we analyzed the geographical distribution of crime rates in Belgium for the period 2001-2006. As far as we know, this is the first time the appropriate spatial regression techniques were used to analyze crime rates over the entire territory of a country. The fact that we can rely on six year averages also implies that the patterns we find can be considered as quite robust. The fact that we obtain a degree of explained variance of up to 73 percent also indicates that the effects we encountered are not negligible.

First of all, the results indicated that crime rates tend to be concentrated in the urban regions of Belgium, with a strong and consistent effect of population density on crime rates, and this holds both for property as for violent crime. As such, our findings are in line with the literature, confirming the fact that crime is mostly an urban phenomenon. The rate of non-nationals, however, only had a weakly significant impact on property crime and no effect at all on violent crime rates. In Belgium, non-nationals are concentrated in urban areas, which are also characterized by high crime rates. But the multivariate analysis clearly demonstrated that the direct link between the presence of non-nationals and crime rates was either weak or non-existent. Especially high unemployment levels seems to explain away the modest effect of the presence of a non-a Belgian population on property crime. A second significant, but under-investigated correlate of crime rates is touristic activity. Both property crime and

violent crime are positively related to the degree of tourism. Since tourism inflates not only the population at risk, but also the opportunities for crime and the number of possible perpetrators, it is not entirely clear whether tourism substantively causes higher crime rates, or whether it is only an artifact of the way crime rates are calculated.

The main goal of the current article was to determine what specific aspect of deprivation is most powerful in explaining crime rates. First of all, it has to be acknowledged that all three indicators that we used (income level, income inequality and unemployment) were related to crime rates, and therefore we can state that deprivation in general clearly is associated with the occurrence of crime, and this is true both for property crime as for violent crime. Only for income inequality our findings are somewhat mixed. Inequality was strongly associated with property crime, but contrary to expectations, we observed a negative relation with violent crime. This allows us to speculate that larger gaps in income, and thus also in available resource and property levels, apparently offered a positive opportunity and incentive structure for property crime. In the literature, however, it is suggested that income inequality will mostly be associated with violent crime, and this proved not to be the case. On the contrary: we observed a significant negative relation. A possible explanation for this pattern might be due to the specific characteristics of the Belgian welfare system. Within this system, minimum income levels are quite firmly entrenched. In practical terms it is impossible than a substantial part of the population of a community would drop below that minimum level. Given this bottom threshold, there is no way a form of underclass would come into existence that would lead to stronger income inequality patterns. Since there is no upper limit to income, in practice, the presence of very high incomes in a municipality is the only way inequality within a municipality can be strengthened. Indeed, we can observe a positive correlation of 0.36 between median income and the inequality coefficient: there is more inequality in the richest municipalities, not in the poorest ones. We fully realize this pattern might be idiosyncratic to the Belgian context, or to countries with a similar social security system. In countries with lower levels of social protection, we might still expect a positive association between inequality and both crime rates. This rather specific finding, furthermore, should not obscure the general pattern that in general, there is a positive association between deprivation indicators and the occurrence of crime.

In comparing income levels and unemployment, for both property and violent crime, we observed that the effect of unemployment was larger than the effect of income levels.

Replacing median income with unemployed in both cases increased the explained variance of the model. In line with the Lin (2008) argument, this points quite strongly to the direction of unemployment as a major ecological correlate of criminal behavior: in municipalities with high unemployment rates, both property and violent crime occur more often, even controlling for various other community level characteristics. While the Lin study documents a positive impact on property crime, our findings allows us to broaden this claim: unemployment is positively associated not just with property but also with violent crime. The impact of unemployment therefore might even be larger and more pervasive than Lin (2008) already argued and certainly this is a relation that needs to be investigated further in future research.

Since we only had access to data on the community level, the current analysis did not allow us to make any interferences about the causal mechanism involved. The causal reasoning developed by Lin rests on individual level mechanisms, but that step was not supported by strong empirical evidence, and the current study does not allow us to elaborate on these individual-level mechanisms. First of all, it should be remembered that we did not have any information about the place where the perpetrator resided. In our spatial analysis, we observed that neighboring communities have an impact on both property and violent crime rates. This by itself already suggests the occurrence of some form of mobility or exchange between municipalities, and therefore one should proceed with caution if one tries to translate the relations we found at the municipality level into individual-level causal mechanisms. Second, the analysis did not inform us about on what side the effect occurs. Some of the elements we studied might increase the odds that one will perform criminal behavior, while others might enhance the risk of being a victim of a criminal offence. To cite but one example: those having a paid job during the daytime will often be present in another community, where they can be the victim of various criminal acts. Those without a job are much less mobile, and therefore they are structurally vulnerable to be victimized within their own community. Earlier studies have indeed shown that the unemployed are much more likely to be the victim of specific forms of crime than the well-off in society. It is also plausible that high unemployment rates had a negative impact on the collective empowerment of a community, leading to forms of social disorganization. A more in-depth study of both victimization surveys and studies of criminal careers, therefore, is called for if we want to arrive at a better understanding of the causal mechanism involved on the individual level.

With regard to public policy, the main conclusion could be that especially unemployment is

strongly related to crime rates. Communities with high levels of income inequality might encounter specific problems, such as with regard to property crime. But the effect of unemployment on crime rates occurs across the board, and it is much more powerful than the presence of non-nationals, for example. Currently, we cannot make any statements about the mechanisms linking crime and unemployment. We can note, however, that future research should take the role of unemployment more strongly into consideration than was the case thus far. Specific community studies in communities or neighborhoods with high unemployment figures might be a promising method to elucidate the question of whether there is indeed a causal mechanism between unemployment and crime rates.

Chapter 6

Conclusions

In this final chapter, an overview of the findings of this dissertation is given. I begin with an interpretation of the main findings in the light of the theoretical framework established in chapter one. This is followed by a critical examination of the policy implications centered on the role of social capital and social integration. Finally, the limitations of this dissertation are discussed, and suggestions for future research are addressed in the final section.

6.1 Main findings

This dissertation investigates the role of social capital and context in well-being. Social capital is seen as the resources embedded in social networks (Lin, 1999), and is investigated through the size, the strength and closeness, and the composition of these network ties (Flap, 2002).

A first important issue of the investigation is the extent to which social relations themselves are influenced by their context. Interdependencies between people are one of the main constituents of community (Völker, Flap, Lindenberg, 2007), and as such the existence of a local influence on personal social networks illustrates the potential of the local context. To conceptualize strength and closeness of social ties, the distinction between bonding and bridging social capital (Putnam, 2000) is used throughout the dissertation. Bonding capital refers to the supportive resources embedded in close and strong ties between similars, existing mainly between kin and close friends, while bridging social capital consists of the informational and instrumental resources embedded in weaker ties between socially or culturally different people. Earlier studies have illustrated that bonding social capital does not differ significantly on the community level (Fischer, 1982; Wellman 1979). Regarding bridging social capital, fewer investigations have been conducted at the population level. In the existing studies, there is a strong emphasis on diversity in socio-economic background and status, or resources in general (Lin & Dumin, 1986; Van der Gaag, 2005), but less on diversity. The increasing diversity of our society demands a minimum degree of intercultural contact, and it has been shown intercultural friendship lessens prejudice (Pettigrew 1998). If these friendships are formed where it is most necessary, namely in communities with a high degree of ethnic diversity, it can be expected that at least on a local level, multiculturalism has not failed, but is a reality.

To fill this gap in the literature, the influence of the local context on the ethnic and religious diversity of weak ties in personal social networks was investigated in **chapter two** of this dissertation. A first result of a more descriptive nature is the prevalence of different forms of cultural diversity. In the Flemish region, 70 percent of people have at least one friend with a different political opinion, and more than 50 percent has a friend of a different generation. About half of the people have an acquaintance that has a different sexual orientation. Forms of diversity linked to cultural boundaries, such as ethnic origin and religion, are less prevalent. Despite that, about 40 percent of the inhabitants has at least one friend in his wider circle from a different ethnic origin or religion.

Differences between the results for ethnic and religious network diversity were limited, which shows that in Flanders people associate both forms of diversity with the same group in the population, i.e. inhabitants from Muslim and non-European descent. On the individual level, ethnic minority groups and people not adhering to the dominant Roman Catholic religion, clearly have higher levels of diversity, which can be explained in terms of their higher propensity to meet someone who is different (Blau, 1977). Higher educated respondents too have more diverse personal networks. As such it can be confirmed that network diversity can also be seen as a different way to operationalize social structure, with higher educated having more diverse networks, as already stated by Bourdieu (1986). Furthermore, students also have more diverse networks, which can be seen either from the life course perspective or Feld's social focus theory (1982): Students are in a phase of their life where they are expanding their friends circles, and they are in universities, places where many young people from different backgrounds are present. The specific profile of students points out that research in a classroom or experimental setting, or based on samples of students, may not be valid for the whole population. Although data-gathering is time-consuming and expensive, survey data remain the golden standard to test the universality of a theory over a whole population.
On the community level, both composition and context effects can be observed. Networks hence are more diverse in diverse communities, and there is an additional contextual effect in communities with a higher proportion of non-European immigrants. It can be confirmed that the choices one makes regarding who his friends are, depend partly on the constraints imposed by the context (Blau, 1977). Answering our first research question, it can be said that, despite strong tendencies towards homophily, a diverse context has an additional influence on personal network diversity. This community influence is modest, which can be explained by two specific features of our study. First of all we were examining a baseline indicator of diversity, namely having at least one friend of a different religious background or ethnic origin. Secondly, in contrast to most studies on cultural network diversity weak ties are studied. These are believed to be less bound by geography, but more heterogeneous and hence open to diversity. As such, the results illustrate that weak ties too are in part local, and the geographical context still plays a role in their composition in this age of globalization and virtual social networks.

In **chapter three**, the attention is shifted to bonding social ties and context, and their influence on subjective well-being. Close and intensive ties, providing emotional support, are the most important factor in explaining individual subjective well-being. In line with Bowlby

(1969), living with a partner can be seen as a central indicator of bonding ties providing emotional support. Next to living with a partner, frequent visits to parents or inviting friends had an additional positive association with higher well-being. Both findings corroborate the theory of Lin (1986), that emotional support is the main social resource involved in maintaining a high level of well-being. As a comparison, the absolute difference in subjective well-being between respondents with a partner, often visiting family and inviting friends and respondents without any of this extensive social support amounts to two points on a ten point scale. To illustrate that this is a substantial difference, a look at differences in the average subjective well-being between nations can put this in perspective. A two point difference in subjective well-being equals the difference in average subjective well-being between an inhabitant of Switzerland (8.0) and Iran (6.0) (Veenhoven, 2011). Attachment to a partner has both direct and important indirect effects. While for singles age has a strong U-shaped curvilinear effect, with a minimum around the age of 57, others show a stable level of well-being over age. Similarly, having an optimistic outlook on life or not plays a larger role in the well-being of singles than for respondents with a partner. These relations hold, even when controlling for family income, occupational status, and rather strong psychological controls such as generalized trust and optimism. Furthermore, participation in associational life does not yield any effects, when bonding social ties are taken into account, which casts some doubts over Putnam's approach to social capital, at least in its relation to subjective well-being.

Next to bonding social capital, both household income and occupational status play a significant role. These results are circumstantial evidence that having a job in itself has a positive effect on well-being, apart from and over the size of the household income.

The role of unemployment on the aggregate level is even more relevant, as very high unemployment levels have negative externalities for all inhabitants of a community. This is a relevant finding for two different reasons. Firstly it shows that in relatively homogenous areas with limited variation in community conditions, such as Flanders, well-being is not related to the community context, while context does play a role when there are substantial differences. Secondly, when context plays a role this means in practice that the same person will have a lower subjective well-being when living in a city with high unemployment rates, than when living in an area with low unemployment. Rephrasing this in a more general perspective, these findings support the idea that larger socio-economic inequalities have a negative influence on well-being and health, even for those holding a better societal position (Wilkinson, 1996). Summarizing the findings of the third chapter, the **second research**

question can be answered: While subjective well-being is directly and indirectly influenced strongly by the quality, more than the quantity, of bonding social capital one has, contextual effects are limited and only occur when large inequalities between communities exist.

The conclusions of these two chapters can be brought together, as both use multilevel analysis to investigate an outcome at the individual level, mainly for the Flemish region. In terms of community, it seems that diverse and mixed cities have a surplus that homogenous communities cannot offer. Subjective well-being is mainly explained by factors on the individual level, especially living with a partner, and this does not differ between cities or more rural environments. Bridging social capital, furthermore, played no role in subjective well-being.[19] The diversity of social relations, and hence the amount of bridging cultural capital, is nonetheless easier to acquire in mixed and diverse cities. This means that I can confirm the hypothesis of Lin (1999) that for expressive actions, such as subjective well-being, emotional support embedded in close bonding relationships plays a large role, while the resources embedded in bridging ties are less relevant in this framework.

In chapter four and five, community level indicators associated with quality of life were analyzed. The level of analysis shifts from individual well-being to community well-being, as we cannot make inferences about individual outcomes using ecological data. Two classical indicators associated with the quality of life in a community, suicide and crime rates, are investigated using ecological population measures and spatial analysis.

The prevalence of suicide as an indicator for community well-being was already investigated by Durkheim (1897/1983). In his seminal study, substantial differences in suicide rates between countries were found and interpreted as results of differences in social integration. Social integration in this dissertation is defined as the community level aspects of social relations in different life domains, reflected in both the aggregate of individual level social involvements, such as having a partner or being unemployed, and true community level contextual information, such as the level of ethnic diversity or income inequality. In **chapter four**, the differences between age-adjusted suicide rates by gender are analyzed at the municipality level, in an attempt to explain the significant differences found within Flanders.

[19] A measure based on the position generator, namely the number of occupations from a predefined list the respondent has in his wider network, was not significant in the model presented in chapter one. Although reporting non-significant results is as important as reporting significant ones, the discussion on bridging ties was removed from the final version of the manuscript.

Suicide rates tend to be higher in communities with higher proportions of single households, an older population and a negative net migration. These elements together indicate a higher risk for social isolation, a fertile ground for suicidal behavior. Two complementary explanations can be formulated. A first plausible explanation is that the higher suicide rates are due to compositional differences in the population. Because immigrants and migrating families have characteristics that lower their chances towards suicidal behavior, on an aggregate level cities where these groups are more prevalent have lower suicide rates. A second and partly documented effect is a concentration effect. Communities with a large proportion of elderly, have a higher suicide rate than could be expected looking at age specific suicide rates alone. This means that the presence of a high proportion of elderly increases the total suicide rate, a relatively unexpected finding.

Deprivation, in the sense of a lower income, was also clearly related to higher suicide rates. Surprisingly the effect of median income was stronger than the effect of unemployment. The measure for income inequality was not yet available at the time of analyses, but contrary to other research, the degree of religious involvement of a community had no effects. This means that in the highly secularized Flemish region, religious involvement does not seem to matter anymore for suicide rates, if adequate controls are used. A last finding that contradicts earlier research results, is that there is no positive association between higher suicide rates and urbanity, but instead male suicide rates tend to be higher in less populated areas. As distinct variables are used instead of composite indicators, some intriguing findings regarding the nature of the influence of migration and diversity surfaced. Usually diversity is seen as a threat to community well-being, but, at least in Flanders, diverse communities with high levels of immigration actually have lower suicide rates. Answering the **third research question**, it is clear that suicide is influenced by social integration, but not always in the expected direction. While low family integration, or the proportion of singles, has a positive impact, status integration, or the employment level was less strong than absolute deprivation. Surprisingly higher levels of diversity and residential instability were negatively related to suicide rates.

A second classical indicator investigated is the crime rate of a community. In **chapter five**, the ecological correlates of crime rates in Belgium are investigated. First of all, it is clear that crime rates tend to be concentrated in the urban regions of Belgium, with a strong and consistent effect of population density on crime rates, which holds both for property as for

violent crime. Deprivation in general is clearly associated with the occurrence of crime, as income inequality, unemployment and median income all are significant predictors of both property and violent crime. When comparing income levels and unemployment, the effect of unemployment showed to be larger than the effect of income levels. The rate of foreigners, however, only had a weakly significant impact on property crime and no effect at all on violent crime rates. Especially unemployment levels seems to explain away the modest effect of the presence of foreigners on property crime, which confirms earlier findings on the relation between ethnicity and crime (Shaw & Mckay, 1942; Wilson, 1986). A second significant, but underinvestigated correlate of crime rates is touristic activity. Both property crime and violent crime are positively related to the degree of tourism. Since tourism inflates not only the population at risk, but also the opportunities for crime and the number of possible perpetrators, it is not entirely clear if tourism substantively causes higher crime rates, or if it is only an artifact of the way crime rates are calculated. In the spatial analysis, I observed that neighboring communities have an impact on both property and violent crime rates. This by itself already suggests the occurrence of some form of mobility or exchange between municipalities. Therefore, one should proceed with caution when translating the relations found at the municipality level into individual level causal mechanisms. The analysis did not inform us about on what side the effect occurs. Some of the elements studied might increase the odds that one will perform criminal behavior, while others might enhance the risk of being a victim of a criminal offence. To cite but one example: those having a paid job during the daytime will often be present in another community, where they can be the victim of various criminal acts. Those without a job are much less mobile, and therefore they are structurally vulnerable to be victimized within their own community. Earlier studies have indeed shown that the unemployment are much more likely to be the victim of specific forms of crime than the well-off in society. It is also plausible that high unemployment rates had a negative impact on the collective empowerment of a community, leading to forms of social disorganization. In response to our **fourth research question**, it can be said that at least one form of social integration, employment, plays a major role in crime rates. Strangely enough, income inequality has an adverse effect on violent and property crime: while more inequality equals more property crime, at the same time it diminishes violent crime. This is related to the meaning of income inequality on the municipality level in the Belgian context: as a solid social security system guarantees that every household has at least a minimum income level, in most Belgian communities the underclass remains rather limited. A community with a large income inequality in practice means a municipality where a significant number of wealthy

people live, while a low income inequality means a relatively poor population. Limited income inequality in this regard means the absence of wealthy inhabitants, and as such a community that is less well-off.

Summarizing the results of both community level analyses, a number of common findings emerge. A first finding is that that there is evidence of significant variation on the community level of crime and suicide rates, even when taking into account only the relatively homogenous region of Flanders. As individual level data are either unavailable or limited, definite conclusions whether these community variations are due to either compositional, and hence individual, or contextual, and hence ecological influences are difficult to draw. With regard to suicide rates, the ecological influence of an older age composition could be illustrated. The negative influence of immigration and diversity, probably is due to compositional effects. With regard to crime, no such claims can be made, as several confounding mechanisms obscure a clear view on context and composition: crime rates are calculated based on the number of inhabitants, and the number of people present in a city can widely differ from this number of inhabitants. Furthermore high crime rates can reflect both a higher number of victims and a higher number of perpetrators. Secondly, both suicide rates and property crime can be seen as contagious community level phenomena, in the sense that communities are influenced by the suicide and crime level of their direct environment. While for suicide this might point in the direction of imitation, or at least of higher tolerance and acceptance for suicide in regions where rates are high, the contagion effect in property crime rates might point to the mobility of crime, which manifests itself as a spill-over effect. Violent crime rates are not contagious, but seem to be spatially concentrated in regions larger than a municipality. A qualitative study of the spatial distribution of the violent crime rates shows that next to urban centers and tourist regions such as the seaside or the Ardennes, violent crime rates tend to be high in the old industrial axis from the Borinage over Charleroi to Liège. One possible interpretation of this finding, based on Wilson (1987) is that violent crime occurs more in regions where there is a concentration of societal problems, of which high unemployment may be the most important but not the only factor. This regionally concentrated disadvantage can be explained in two ways. A cultural explanation is that concentrated disadvantage leads to less social control and higher acceptance of violence as a way to solve disputes. A more epidemiological explanation is that higher unemployment and deprivation is associated with alcoholism and other dysfunctional coping strategies, leading to a higher prevalence of violence.

6.2 A critical reflection on policy implications

Well-being and quality of life are high on the agenda of policy-makers. On the level of the European Union, the Lisbon strategy, Europe 2020 and the Istanbul declaration provide guidelines that individual and community well-being are considered as key areas. The Flemish government, from the Pact of Vilvoorde (2001) to its more recent 'Flanders in Action – Pact 2020', mirrors these developments on the European level. As the emphasis is on statistical indicators to measure the progress, the choice and order of the indicators themselves is already a measure of the importance attached to different aspects. While encouraging a competitive knowledge based economy is priority number one, the second target is to make Flanders a region that is open, tolerant and cohesive. For this second target, the emphasis is on associational participation, social interaction and equal access to the job market by combating disparities by gender, educational level and ethnicity. Other goals in relation to this study are far more down on the list. The twelfth target is adapting the health sector to the demands of demographical challenges such as the ageing of the population. Combating poverty is only the thirteenth target, although more than one in ten inhabitants of the Flemish region is estimated to live at risk of poverty. By themselves, these targets are very laudable, and accurately reflect the coming challenges, i.e. a more diverse society with a higher proportion of elderly. As the strategies that will be used to reach these targets as less clear, it is not easy to evaluate policy. Nevertheless, some clear recommendations can be given from this research. I will elaborate on these in the next paragraph.

Close bonding social capital has been shown to play an important role for subjective well-being, and concentrations of socially isolated and older people are associated with higher suicide rates. Although it is not my opinion that sociability should be enforced, it can be enhanced in many ways. One possibility to foster social relations, is the lasting existence of basic local facilities and small businesses, such as post offices, bakeries, pubs, etc. in more rural areas. These places often form the last places where locals meet each other for a small chat. Once they disappear, as is now slowly happening due to rationalization and privatization, people are left at home with their TV-set.

Secondly, diverse networks are expected to increase tolerance (Pettigrew, 1998). The social ties an individual chooses to make or break, are primarily a part of the individual life sphere. Nevertheless, as was illustrated in chapter two, the context in which we live does influence

the kind of relations we have. As such, policy can have an influence on the social networks of individuals. By creating a social mix in residents of communities, it can be expected that network diversity will significantly rise. As a policy idea, social mixing already has a long history (Sarkissian, 1976), and as such it has to be implemented based on best practices. A social mix in this regard ideally encompasses single households and families, welfare recipients and employed inhabitants, Belgians and immigrants. It should be noted that the current version of the so-called Flemish Living Code, goes against the idea of a social mix, by making the knowledge of Dutch or the willingness to learn the language a mandatory precondition to have a right for social housing. Although it is not disputed that knowledge of Dutch is a necessity in order to fully integrate in Flemish society, it should be noted that on the private market this is not a prerequisite. As such, this code opens up possibilities for malevolent landlords to extort immigrants who due to language restrictions and a tight budget cannot afford decent housing. In my view, the language will be learned a lot quicker when someone lives in a social housing project next to a Flemish family. Important to note is that this social mix should not be limited to giving immigrants access to social housing, but to try to attract different layers of the population, by providing different types of housing, and a functional mix with green environments, meeting places, small businesses next to residential zones (Jacobs, 1961).

On the aggregate level, it is clear that there is one social problem that dominates all the others: ***unemployment.*** The negative influence of unemployment on subjective well-being is larger than its financial aspect, and on the aggregate level cities with high levels of unemployment have less satisfied inhabitants, higher crime rates, and higher suicide rates. Although unemployment is high on the agenda, this often seems more out of concern for the social security budget, and the rise of our GDP, than for the genuinely positive spill-over effects employment has on the lives of individuals and communities. Although in general high levels of employment are associated with a growth in GDP, this relation, known as Okun's Law, is not constant and depends on several other factors (Abel & Bernanke, 2005). On the other hand, the direct and indirect positive effects of employment on individuals are manifold, and are stable for decades: employment enhances well-being, limits crime, enhances community level social cohesion (Botterman, Hooghe & Reeskens, 2011), next to its evident functions of providing a better income, giving access to a wider network, and allowing a person to fulfill a useful role in the public sphere. These aspects of working nevertheless are less prominently used in policy when talking about the use of providing jobs. Similarly, spending more on

creating jobs could save on unexpected policy fields, due to the numerous spill-overs of higher employment.

With regard to suicide, it should be noted that the current Flemish Suicide Prevention Plan 2006-2010 does not contain a single community level measure, which is remarkable as a wide spectrum of measures is proposed, ranging from informational websites and free phone lines to talk about things, to strengthening professional expertise and media guidelines in reporting on suicide. Although Durkheim published his study more than a century ago, few ideas regarding community based suicide have made it to policy discussion boards in Flanders. In chapter four, some community characteristics are identified that significantly heighten the risk for suicide. A high proportion of elderly, singles and few newcomers were key aspects of higher suicide rates. It can be assumed that closed communities, with few possibilities for social interaction have a higher risk of social isolation among its inhabitants. A local prevention strategy in high risk areas accompanied by a more general strategy of both health care workers and associational partners to reach isolated inhabitants is advised. This strategy has shown to have positive results in a Japanese rural setting (Oyama et al. 2005). Although our study statistically does not allow us to make individual level conclusions, it is quite reasonable to hypothesize that elderly and singles, concentrated in the same areas form a risk group for suicide, currently not yet implied in the Prevention plan. On a positive note, the new prevention plan will be drafted based on the results of a large conference on suicide, to be held in December 2011, with the explicit aim to involve all stakeholders, from professionals over researchers to the family of victims. The publication of the research article and the publicity it received through the press has already sparked numerous local health care agencies to set up a local prevention plan, and some associations from civic society have already asked for input in their local strategies to bring people together. The new suicide plan should try to enhance these kinds of community actions, as they are expected to have spill-over effects on suicide rates. In response to three parliamentary questions triggered by the analyses presented in chapter four, minister Vandeurzen explicitly stated that he would take these new findings into account (Vlaams Parlement, 2011, p.14-15).

Taking a different frame on this research, I would like to underline that I have tried to investigate social relations on the Belgian level where possible, and restricted myself to the Flemish level in case of data constraints. By this it has been shown that Flanders is relatively homogenous, some important differences between urban and rural areas notwithstanding,

while there are more variations within the Belgian context. The current system of research funding and higher education, which is based on the federal structure of Belgium, does not always make it easy to do this kind of nationwide investigations. Still I am convinced that the nationwide results are both academically and policy wise more relevant than just investigating the Flemish region. One possible solution could lie in a closer management of data, on an interregional or federal level. Although the current institutional context does not seem to be evolving towards a stronger Belgian framework for research, for several branches of the social sciences this could become a necessity. The practical implications of this regionalization of science policy, such as maps with a hole in the centre because data from the Brussels Region were not gathered, luckily are limited by the excellent statistical service of the Flemish government. Similarly a lot of European surveys and data luckily are available for the entire country. Nevertheless, becoming an open society in solidarity, the second target of the Pact 2020, should not go at the cost of a neighboring region, with more severe challenges in terms of unemployment and well-being. Since Flanders is definitely not an island when it comes to trade, culture and people, we should be careful not to make it one in terms of science policy.

6.3 Limitations

The limitations of this dissertation will be discussed in connection with both the methodological limits imposed by cross-sectional, ecological and quantitative analysis, and a the geographical confined reach of this research project. A last, more fundamentally theoretically oriented exploration of limitation is the broad scope of this dissertation combined with its article based structure.

Firstly, this dissertation rests on cross-sectional data, and as such does not incorporate time as an analytical dimension. This limitation in practice means that causality claims in the true sense cannot be made, and that causality can run in the opposite way than stated. This would mean that people with diverse networks choose to live in diverse cities, instead of the friendship network becoming more diverse due to the context. Or that people with a higher subjective well-being are better in making and keeping tight and close relations with friends and family. On the community level, it could mean that higher suicide levels in a municipality cause higher proportions of singles, or that higher crime levels cause more unemployment. Although some of these claims may convey a part of the truth, it is not possible to be sure

about the plausibility of each causality chain, without relying on time-series or panel data. As these data are either very costly, or difficult to get, they were not incorporated in our design.

A second methodological point of limitation is related to the ecological research design. Contextual and compositional explanations could not always be statistically distinguished, and individual level relations could not be assessed in the case of crime and suicide. Furthermore I believe that these shortcomings do not justify the total abandoning of ecological methods, in favor of individually centered, and often very limited data. One infamous example in this regard is the study of Van San & Leerkens (2001), that examined criminality by looking at variations in age, gender and ethnicity of offenders. It is clear that such an approach can never take social context into account, as these data are simply not available. A solution here could lie in the exploitation of new and original methods of data-gathering, such as questioning medical professionals about their patients, interviewing people who recently attempted suicide, or matching records of suicide cases with the available data in the national registry or social security database. It is clear that due to privacy legislation, these forms of data-gathering are not easy, but could yield a significant amount of insight into the relation between individual level suicide factors and community level associations. A second solution, already implemented in a number of larger cities, is to disaggregate a number of key statistics to the neighborhood level. This lower level scope could yield even better insights, but I chose to exploit the relatively unused municipality level statistics for a larger amount of municipalities, so that also less urban communities are implied in the research.

A third limitation is related to the quantitative nature of our method. Some questions are hard to answer using only statistical tools. Qualitative community studies could further enhance not only the interpretation of the data, but also the mechanisms behind the found relations. How does the negative influence of unemployment on the aggregate level influence the subjective well-being of an individual? What exactly is the meaning of being a friend in one's wider friends circle, and to what extent does it lead to intercultural communication? Similarly, neighborhood and community approaches, and direct observation could be useful to map the exact places where crime occurs. What are the crime hotspots, places where many people pass by, or places in the city that are deserted? Next to this kind of adventurous data-gathering in the field, a closer relation and involvement in policy frameworks could also be beneficial, both for the academic community and the quality of policy. At the moment it seems as both sides are very happy with the instrumental and symbiotic relation that exists: at one side there

is academic freedom, albeit under the pressure to publish or peril, and at the other hand there is the very instrumental and occasional interest in social science, most often when a new survey has to be designed. I am convinced a closer involvement of research findings in designing policy, can be a fruitful process, both for researchers working on a specific topic, for the overburdened assistants of policymakers, and for the population at large.

A fourth limitation of this study is the fact that it mostly talks about Flanders and Belgium. Both the variation and theoretical implications of a study in one region or country are limited. Especially in an age where multiple surveys from different countries, and even different continents are freely available, it seems parochial to confine oneself to the exploration of a rather small and insignificant region. Nevertheless, as this dissertation is in large lines an outcome of a research project investigating social cohesion in the Flemish region, this limited geographical scope was a necessity to achieve the target of my research, and investigate how large the influence of the local context in a relatively homogenous region is. Furthermore, this limitation allowed me to design a survey questionnaire that included some measurement instruments not available in other international surveys.

A theoretical limitation is the wide scope of this dissertation, in combination with the choice for an article based dissertation. As the focus is on several relatively broad concepts, such as social relations, context and well-being, none of these themes has been investigated in full detail, and smaller or bigger question remarks remain in place regarding the mechanisms at work. I am convinced this broad scope is a strength in its own right, as it stimulates finding theoretical perspectives across disciplines. Nevertheless, some important questions that merit attention remain unanswered, and will be described in the last section.

6.4 Suggestions for further research

In this last section some questions and topics that were unearthed during this research project will be listed. I hope to be able to contribute to the further exploration of these problems myself, but also hope to stimulate others to take up these challenges.

A first challenge is to investigate bonding and bridging social ties in a comparative and longitudinal perspective. Panel data or cross-sectional time series could deepen the substantial

findings on the structure of social networks, for example by investigating explanations in terms of life course, period or generational effects. One possible aspect that could be further investigated in this way, is the decline of social support networks of elderly. Which aspects of social support decline first, and what are their implications on health and well-being outcomes? To what extent are declines in social support networks culturally determined by the societies in which people live, by events in people's lives such as disease, or other contextual factors? Can the current generation of elderly seen as having more or less bonding capital in comparison with the previous generation?

In a similar vein, the role of partnership could benefit from closer and longitudinal analysis. Is the impact on subjective well-being of losing a partner, either by divorce or widowhood, the same as never having had a partner? Can a long term or short term revival of well-being be detected, and if so what are characteristics of people who manage to get back to their previous level of well-being?

On the community level, neighborhood level statistics could provide more insight into the interrelation between different kinds of community mechanisms and social integration. If a community is not doing very well, what is the relatively weight of respectively social relations and networks, trust and collective efficacy, neighborhood facilities and the spatial lay-out of a place in this demise? Do these factors tend to cluster, and to what extent can successful strategies to community building be distinguished? Can a short-term partial approach, relying on improving neighborhood relations and facilities, lessen the social evils associated with low levels of trust? On the other side of the coin, are these factors, that are deemed essential to community and social order, present in better-off neighborhoods? If this is not the case, it could well be that the presumed relation between community well-being and the presence of a local community is spurious, and that deprivation in itself matters most.

Looking at crime, unemployment and suicide, an econometric time-series approach could yield better insight in the causal relationships, once enough observations have been collected. Does crime follow or cause low employment? The current minister of health ascribes a higher number of suicides to the economic crises, based on earlier international analysis on the country level, but exact analysis on municipality level Flemish data have not been executed. The role of lower economic growth in suicide rates nevertheless could be investigated relatively easy.

Similarly, the relation between unemployment and crime, or between single households and suicide could be mapped in more detail, as the fluctuations in both could be investigated. A second possible alternative to cross-sectional analysis, is investigating subjective well-being using social network analysis. To what extent does the structure of close relations influence one's subjective well-being. Is well-being contagious among network members? To what extent does the wider setting have an influence on weak ties, e.g. classrooms?

A last important set question that could not be investigated in this dissertation relates to cultural differences. A first research topic is the social network structure of inhabitants of non-Belgian origin. The current analysis was limited to examining cultural diversity, and the sheer fact of being an ethnic minority had the logical outcome of more diversity, as contact with the out-group is a part of daily life. To what extent are their strong and weak networks different from Belgian inhabitants with similar socio-demographic characteristics? In other words does network structure have a cultural component? Keeping in mind that network analysis originated from anthropological research, one would expect so. Nevertheless current network analysis tends to find similar network structures in different parts of the world. Has globalization touched upon our intimate lives to the extent that we have similar social lives, no matter what our cultural history, or are contemporary approaches to social networks to much focused at relatively western societies? A second point of interest is the influence of social integration for arriving immigrants. Are the main factors for a successful societal integration in multiple domains already achieved upon arrival, or can they be acquired? To what extent does cultural and social integration, currently seen as the golden road to success, contribute to normative integration apart from and over integration in the labor market?

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Appendices

Appendix to Chapter 2

Cluster sampling

The goal in the sample design surveys is to obtain a sample that is representative for the population, so that inferences can be made. Random selection is a safe method to generate a representative sample of the entire population. Randomization is the assignment of objects (subjects, treatments, groups, etc.) of a population to subsets (sample) of the population in such a way that, for any given assignment to a subset (sample), every member of the population has an equal probability of being chosen for that assignment.

Cluster sampling involves partitioning the population into separate groups called clusters. This technique is mainly used to reduce the population heterogeneity and to increase the efficiency of the estimates. Cluster sampling is a way to randomly choose smaller geographic areas, so that a cost-effective systematic random sample can be selected on the lower level.

In two-stage cluster sampling, a simple random sample of municipalities is selected and subsequently a simple random sample is selected from the selected units in each cluster. For the first step our clusters need to be determined, so we applied cluster analysis to municipal level data (N=308) of some important variables for the year 2005. This year was chosen because it was the most recent year for which all relevant variables at the level of the municipality were available at the time of designing the survey. The second step is unrestricted random sampling of inhabitants within each municipality.

Cluster analysis

Cluster analysis is an exploratory data analysis tool which aims at sorting different objects into groups in a way that the degree of similarity is maximal between objects belonging to the same group and minimal between objects belonging to different groups. The aim is to

establish a set of clusters such that cases within a cluster are more similar to each other than they are to cases in other clusters. Often similarity is assessed according to a distance measure. The selection of measures in which regard objects are similar or dissimilar, as such is defining for the resulting cluster analysis

Distance measure

A distance measure determines the *similarity* of two elements. There is more than one way to measure a distance. Since our variables are continuous, the Euclidean distance between two points is used. Euclidean distance is probably the most commonly chosen type of distance. It simply is the geometric distance in the multidimensional space. It is computed as:

$$\text{distance}(x,y) = \left(\sum_i (x_i - y_i)^2\right)^{1/2}$$

Selection of variables

Determining which variables are important is related to the subject at hand. As we want to achieve a maximum spread in social cohesion on the community level, a number of variables measuring the social, economic, demographic, criminological profile of each municipality is taken into account. These variables help us to arrive at a better understanding of the multivariate structure, and as a by-product, their dimensions are reduced so that the diversity of measures can be summarised in a couple of factors.

Principal component analysis is used to reduce the complexity of data. When patterns are identified in the data, the data can be compressed by reducing the number of dimensions with respect to these patterns, without much loss of information.

The component matrix, calculated by using different variables for 308 municipalities in Flanders for the year 2005 is listed below.

Rotated component matrix

	Component				
	Urban Density	Population Mobility	Industry	Economic Inequality	Demographics
Number of Active Firms	**.966**	.018	.116	-.038	.057
Total Population	**.943**	.051	.204	-.094	.000
Number of self-employed persons in main profession	**.938**	.023	.088	.014	.115
Number of employees in the public sector	**.928**	.063	.138	-.066	.003
number of available infrastructures (culture)	**.910**	026	.111	-.058	.155
Number of employees in the tertiary sector	**.905**	.092	.228	-.060	-.006
Total foreigners rate per 1000 inhabitants	.009	**.954**	.109	-.073	-.119
External Immigration Rate	.109	**.953**	.041	-.057	-.074
External Emigration Rate	.042	**.950**	.072	.138	-.015
Population Density	.133	.072	**.918**	.091	.073
Percentage of built surface	.121	.032	**.890**	.197	-.043
Percentage of industries and port surface	.245	.024	**.843**	-.075	.024
Crime Rate	.320	.254	**.631**	-.179	.292
Interquartile Coefficient	-.070	.085	-.020	**.931**	.022
Mean Income	-.029	.098	.213	**.905**	-.003
Unemployment Rate	.146	.422	.114	**-.712**	.202
Rate of retired people over active population	.077	-.055	.089	-.026	**.952**
Mean Age	.097	-.125	.047	-.056	**.948**

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations.

As can be seen from the component matrix, for classification demographic, socio-economic criminological and spatial planning indicators are used. This provides us with five components, measuring respectively urban density, population mobility, industry, economic inequality and the demographic profile of a municipality.

Outliers

Cluster analysis is also useful to detect outliers. Outliers may emerge as singletons or as small clusters far removed from the others. In our analysis, Antwerpen, Gent and Herstappe are considered as outliers, as they do not fit well into other clusters. Antwerpen and Gent have a special status as the two largest cities in the Flanders region, and are included in the design as separate entities. Herstappe is excluded from the sample since the population is too small (n=82) to allow a sampling point.

Number of clusters

Finding the "right" number of clusters is another important issue in cluster analysis. Determining the optimal number of clusters also has a substantial theoretical aspect, and in our case a maximal representation of different groups of municipalities, and hence a high number of clusters will be strived for. Through hierarchical clustering the data structure will be examined, to construct groups based on K-means clustering in the second step. A third procedure, two-step clustering, takes the decision about the number of clusters automatically and hence leaves less flexibility to the researcher to explore the data. Instead, a series of partitions takes place, which may run from a single cluster containing all objects to n clusters each containing a single object. Hierarchical clustering is subdivided into *agglomerative* methods, which proceed by series of fusions of the n objects into groups, and *divisive* methods, which separate n objects successively into finer groupings.

Hierarchical clustering uses a dendrogram to represent the possible choices of number of clusters, with the individual elements at one end and a single cluster containing every element at the other. The optimal solution is somewhere between both extremes. Agglomerative algorithms begin at the leaves of the tree, whereas divisive algorithms begin at the root. This method builds the hierarchy from the individual elements by progressively merging clusters. The number of clusters can be determined by answering the question of at what point we should chop this tree. This can be decided by looking at where the branches still carry sufficient information as it is of utmost importance that the final typology does not only group data in an efficient manner, but also has a conceptual practicality.

In order to decide the cluster numbers there are several methods depending on the data itself, by taking into account the diminishing of the distance between the different data points in the group. Each time it is calculated if it is worth adding a new cluster. Milligan and Cooper (1985) examined about 30 of these methods, also called "stopping rules". The Calinski and Harabasz (1974) method emerged as the best and most reliable. This test which considers both the internal homogeneity of each cluster and the heterogeneity between several clusters, and for this reason it is classified among the global methods. The optimum number of clusters according to the variance ratio criteria (VRC) of Calinski and Harabasz is the ideal if a local maximum is reached.

VRC(k) = (BGSS(k) / (k-1)) / (WGSS(k) / (n-k))

Where *k* is the number of clusters, *n* is the number of data points, WGSS is the within-group the sum of squares (or the sum of the distance from each point to the centre of the cluster to which it belongs in the square) and BGSS is the between-groups sum of squares (or the sum of the distances of the cluster-centres of the total centre).

A second test will be Hartigan's (1975) method, taking into account only internal homogeneity. The advantage of this test is that it assigns also a value in those cases where there is only one cluster in the data to retrieve. The Hartigan index shows the ideal minimum number of local clusters.

H(k) = ((WGSS(k) / WGSS (k+1)) -1) (n-k-1)

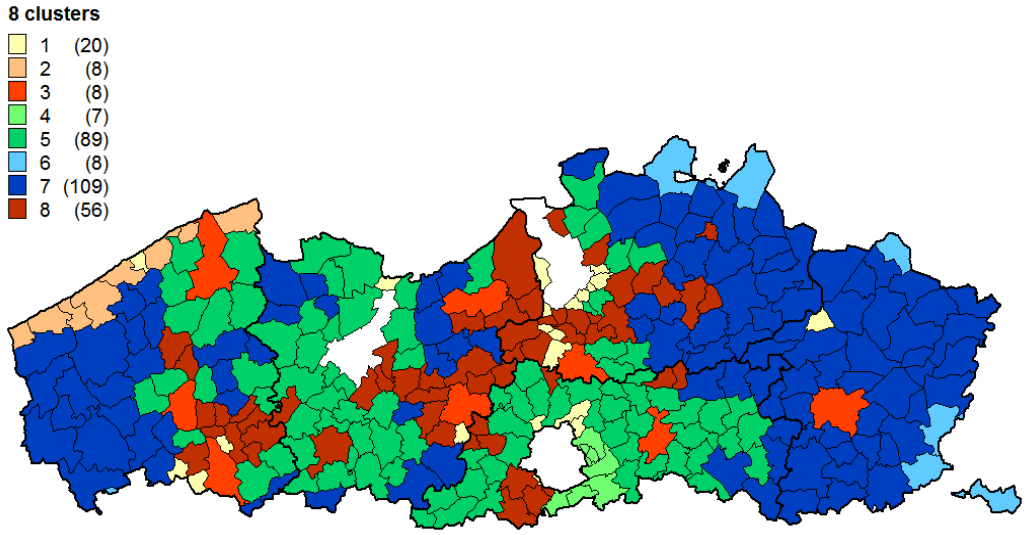
Where *k* stands for the number of clusters, *n* for the number of data points, WGSS is the within-group the sum of squares (or the sum of the distance from each point to the centre of the cluster to which it belongs in the square) and BGSS is the between-groups sum of squares (or the sum of the distances of the cluster-centres of the total centre).

Stopping rules with respect to VRC

K	Within Group Sum of Squares	Between Group Sum of Squares	VRC(K)	H(K)
1	1520	0		44.01847
2	1326.634	15.50578	3.529794	58.98731
3	1109.253	33.13781	**4.496035**	59.01785
4	926.9062	35.40521	3.819719	48.82384
5	796.7969	37.37818	3.506564	58.00279
6	666.9764	60.03862	5.36496	24.43084
7	616.2818	77.8074	**6.249521**	20.64774
8	576.0958	83.87522	6.156483	**-2.7067**
9	581.4306	105.4958	6.690664	15.57586
10	552.1767	134.4566	7.954426	45.12161
11	478.4899	160.0347	9.799614	

We can conclude from these indicators that 3, 7 or 8 clusters would be optimal for dividing the Flemish municipalities (excluding the outliers Antwerp, Gent and Herstappe) into subgroups on the basis of the corresponding variables. Because we were interested in maximizing the variance at the municipal level in Flanders, we opted for the maximum number, and we assigned eight different clusters.

Cluster analysis: eight cluster solution



Cluster analysis: results, typology and sample size

Cluster	Number of municipalities	Typology	Total population (2005)	Sample points	Example of Municipalities in cluster
1	20	Industrial suburbs	326.658	2	Willebroek Zelzate
2	8	Coast	193.119	1	Oostende Hasselt
3	8	Large cities	632.750	5	Kortrijk Leuven Roeselare Sint-Niklaas
4	7	Eastern range of Brussels	128.009	1	Overijse
5	89	Rural, with older population	1.189.754	9	Bekkevoort Boechout Glabbeek Hooglede Kampenhout Laarne Roosdaal Staden Tielt
6	8	Border municipa-lities	94.119	1	Lanaken
7	109	Rural, younger population	1.813.397	13	Aarschot Dessel Diepenbeek Houthalen Ichtegem Ieper Kinrooi Landen Ninove Sint-Truiden Stekene Tessenderlo Tienen
8	56	Strongly Industrialised	1.006.096	7	Erpe-Mere Izegem Lier Ranst Waregem Wevelgem
Antwerpen	1		461.496	3	Antwerpen (3x)
Gent	1		233.120	3	Gent (3x)
Total	307		6.078.518	45	

The number of inhabitants in each cluster is taken into account to assign sample points to each typology. Since we select 45 sample points with an effective sample size of 45 repondents, for approximately every 135,078 inhabitants we grant one sample point. Within each cluster the size of municipality is considered for the selection probability of the respondent. Due to rounding, 44 of the 45 planned clusters could be assigned in this manner. After that there is one cluster is left and assigned to be Gent. The latter decision was made as a measure of

precaution: since we know that response rates tend to be lower in the major cities, the final cluster was assigned to the second largest city in the region, to compensate for possible lower response rates in the major cities. Secondly, in this we the two largest cities have a sample size that allows for reliable comparison.

Typology according to principal components for 305 Flemish municipalities.

	Urban Density	Population Mobility	Industry	Economic	Demographics
Industrial suburbs	-0.564	-0.244	2.529	-0.590	0.133
Coast	0.349	0.360	0.308	-1.102	4.056
Large cities	4.738	0.046	0.353	-0.018	-0.100
Eastern range of Brussels	-0.166	3.370	0.956	2.059	0.016
Rural, with older population	-0.144	-0.245	-0.446	0.911	0.160
Border municipalities	-0.484	3.874	-0.881	-1.011	0.083
Rural, younger population	-0.063	-0.058	-0.434	-0.708	-0.363
Strongly Industrialised	-0,08271	-0.443	0.563	0.188	-0.174

N=305

Sample

Following the cluster analysis, 40 municipalities are selected from which the random sample will be drawn. Within the clusters, the sample points were assigned randomly and proportionate to the number of inhabitants of a municipality. It has to be noted that since the clusters were assigned proportionate to size, it is possible that a municipality receives more than one cluster. Thus was the case for Brugge, where two sample points were assigned.

Second, the number of respondents that will be drawn out of each municipality in the sample is determined. The expected effective sample size for every sample points is 45. However, we can assume that response rates will not be uniform across the territory: response will be lower in the urban areas compared to the rural areas of Flanders. To compensate for this effect, the initial samples have to be larger for the cities than for the urban municipalities. The exact sample sizes are calculated according to the response rates in the selected municipalities in previous surveys.

As having a sample that is both large enough and representative for each municipality is of utmost importance for the research project, a back-up sample set is selected for each

municipality. When the exact sample size for a municipality is not reached, a part of the extra sample, proportionate to the needed extra response, will be used.

Selected municipalities and sample sizes

Name of the Municipality	Sample Point	Exact Sample Size	Expected Respons Rate	Final Sample Size	Back-up Sample	Total Sample Size
Aalst	1	45	0.66	68	68	136
Antwerpen	3	135	0.56	243	243	486
Beringen	1	45	0.66	68	68	136
Brasschaat	1	45	0.66	68	68	136
Bree	1	45	0.66	68	68	136
Brugge	2	90	0,66	136	136	272
Damme	1	45	0,66	68	68	136
Eeklo	1	45	0,66	68	68	136
Gent	3	135	0,59	230	230	460
Grimbergen	1	45	0.66	68	68	136
Hamme	1	45	0.66	68	68	136
Hasselt	1	45	0.66	68	68	136
Heist-Op-Den-Berg	1	45	0.66	68	68	136
Herne	1	45	0.66	68	68	136
Herselt	1	45	0.66	68	68	136
Hoeilaart	1	45	0.50	90	90	180
Hoogstraten	1	45	0.66	68	68	136
Houthalen-Helchteren	1	45	0.66	68	68	136
Houthulst	1	45	0.66	68	68	136
Lochristi	1	45	0.66	68	68	136
Maasmechelen	1	45	0.66	68	68	136
Merchtem	1	45	0.66	68	68	136
Oostende	1	45	0.56	81	81	162
Oud-Heverlee	1	45	0.66	68	68	136
Oudenaarde	1	45	0.66	68	68	136
Oudenburg	1	45	0.66	68	68	136
Pittem	1	45	0.66	68	68	136
Ronse	1	45	0.50	68	90	180
Ruiselede	1	45	0.66	68	68	136
Sint-Amands	1	45	0.66	68	68	136
Sint-Gillis-Waas	1	45	0.66	68	68	136
Sint-Niklaas	1	45	0.59	77	77	154
Temse	1	45	0.66	68	68	136
Tielt	1	45	0.66	68	68	136
Tongeren	1	45	0.66	68	68	136
Veurne	1	45	0.66	68	68	136
Vilvoorde	1	45	0.56	81	81	162
Wetteren	1	45	0.66	68	68	136
Wichelen	1	45	0.66	68	68	136
Zandhoven	1	45	0.66	68	68	136
Total	45	2025			3208	6416

The sample was delivered by the National Registry, and was drawn from the population of the Flemish Region between 18 and 85 years old in the selected municipalities.

Representativeness of the sampled municipalities

A representative sample resulting from a sampling plan is expected to adequately reflect the properties of interest of the whole population. In other words, representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population's parameter variations at a sampling point. For the reliability of our survey results we need to be sure about the representativeness of our sample.

The mean and standard deviation for both all Flemish municipalities and the ones in our sample and t-test significance for a number of key variables is shown below.

T-test for a number of key characteristics of the selected municipalities

	All municipalities (308)		Sample (40)		T-test
	Mean	Standard Deviation	Mean	Standard Deviation	Sig.
Population density for 2005	518.23	445.79	494.81	366.09	0.373
Rate of foreigners per 1000 inhabitants in 2005	38.30	52.08	41.69	48.07	0.536
Mean Income 2005	25699.95	3029.65	25040.41	2864.72	0.055
Median Income 2005	19692.68	1401.89	19306.02	1356.89	0.027*
Interquartile Coefficient for 2005	106.52	11.56	104.41	11.27	0.104
Crime Rate 2005	17.13	6.99	18.15	7.06	0.049*
Mean Age 2005	40.38	1.41	40.14	1.23	0.937
Unemployment Rate 2005	6.98	2.29	7.56	2.63	0.038*
Percentage of built area	0.19	0.09	0.19	0.07	0.963
Percentage of industry and harbour	0.07	0.04	0.07	0.04	0.181

Source: NIS, Sign. * $p<0.05$

In order to see if the means of several indicators for the sample is significantly different from the population sample significance test are estimated. In this test we test the hypothesis if the sample mean is significantly different from the population mean. Most of the indicators prove the sample to be representative, as the sample means are not significantly different from the population means. "Median Income", "Unemployment Rate" and "Crime Rate" are slightly

different from the population average. In this regard it is important to keep in mind that the SCIF survey serves a dual purpose. For theoretical reasons (the study of determinants of social cohesion), the slight overrepresentation of 'problematic' areas might be considered as an advantage, since it makes inferences about these areas easier and more reliable, even if they are not so many. At this point, it is clear that the sampled municipalities are a good reflection of Flanders as a whole. Due to the proportionate to size selection of the sample municipalities, a few characteristics typical for larger areas are slightly more present in the sample than in the total population of Flemish municipalities.

Appendix to Chapter 5

Variables used in the analysis

1. Median Income: Median Income per inhabitant of the municipality 2001-2006. Source: National Institute of Statistics, Belgium. Range: 15080.51-25960.53 euro. Natural log values were used in the analysis.

2. Gini coefficient for income inequality (after taxes) 2001-2006. Source: National Institute of Statistics, Belgium. Range: 0.233-0.428.

3. Unemployment Rate: Percentage of unemployed as percentage of the total labour force 2001-2006. Source: National Employment Office, Belgium. Range: 3.16-33.35. Natural log values were used in the analysis.

6. Population Rate for Ages 15-24: Percentage of people between age of 15-24 in the municipality 2001-2006. Source: National Institute of Statistics, Belgium. Range: 8.94-15.98

7. Non Nationals Rate: Percentage of inhabitants of a municipality without Belgian citizenship status 2001-2006. Source: Source: National Institute of Statistics, Belgium. Range : 0.42–41.17.

8. Population Density: Population density of the municipality (inhabitants/surface in km^2) 2001-2006. Source: National Institute of Statistics, Belgium. Range: 22.16-20766.73. Natural log values were used in the analysis

9. Tourist Activity. Rate of the number of overnight touristic stays to the number of residents in a municipality (2001-2006), divided in three categories; no or very few overnight stays (n=283), less overnight stays than inhabitants (n=118), more overnight stays than inhabitants (n=188). Source: National Institute of Statistics, Belgium.

10. Property Crime Rate: Rate of the property crimes per 1000 inhabitants of the municipality 2001-2006. Source: Directorate of Operational Police Information of the Belgian Federal

Police, Service Policy Information. Range: 2.23-92.80. Natural log values were used in the analysis.

11. Violent Crime Rate: Rate of the violent crimes per 1000 inhabitants of the municipality averaged for the years between 2001-2006. Source: Directorate of Operational Police Information of the Belgian Federal Police. 2.03-35.85. Natural log values were used in the analysis.

12. Regional dummies: Municipality belongs to one of the three autonomous regions in the country. Flanders (n=308 municipalities), Brussels (n=19), Wallonia (n=262).

Summary

This dissertation investigates the role of social capital and context in well-being. Social capital is seen as the resources embedded in social networks. Well-being is investigated both at the individual level, in the form of satisfaction with life, and at the community level, through crime and suicide levels. To conceptualize strength and closeness of social ties, the distinction between bonding and bridging social capital is used throughout the dissertation. Bonding capital refers to the supportive resources embedded in close and strong ties between similars, existing mainly between kin and close friends, while bridging social capital consists of the informational and instrumental resources embedded in weaker ties between socially or culturally different people.

A first important point is the extent to which social relations themselves are influenced by their context. It can be said that, despite strong tendencies towards homophily, a diverse context has an additional influence on personal network diversity. This illustrates that weak ties too are in part local, and the geographical context still plays a role in their composition in this age of globalization and virtual social networks.

Close and intensive ties, providing emotional support, are the most important factor in explaining individual subjective well-being. Living with a partner can be seen as a central indicator of bonding ties providing emotional support. Large socio-economic inequalities have a negative influence on well-being, even for those holding a better societal position. While subjective well-being is directly and indirectly influenced strongly by the quality, more than the quantity, of bonding social capital one has, contextual effects are limited and only occur when large inequalities between communities exist.

Shifting the level of analysis from individual well-being to community well-being, two classical indicators associated with the quality of life in a community, suicide and crime rates, and their relation with social integration are investigated. Social integration is defined as the community level aspects of social relations in different life domains, reflected in both the aggregate of individual level social involvements, such as having a partner or being unemployed, and true community level contextual information, such as the level of ethnic diversity or income inequality. Suicide rates tend to be higher in communities with higher

proportions of single households, an older population and a negative net migration. These elements together indicate a higher risk for social isolation, a fertile ground for suicidal behavior. Crime on the other hand is related more to income inequality and unemployment, indicators for deprivation and exclusion from the job market. Both suicide rates and property crime can be seen as contagious community level phenomena, in the sense that communities are influenced by the suicide and crime level of their direct environment. While for suicide this might point in the direction of imitation, or at least of higher tolerance and acceptance for suicide in regions where rates are high, the contagion effect in property crime rates might point to the mobility of crime, which manifests itself as a spill-over effect. Violent crime rates are not contagious, but seem to be spatially concentrated in regions larger than a municipality.

In summary it can be confidently stated that social relations are related to different indicators of well-being. Subjective individual well-being is related to bonding social capital, while community well-being is associated more with social integration in the private or public domain for suicide and crime rates respectively.

Samenvatting

Dit proefschrift onderzoekt de rol van sociaal kapitaal en context in welbevinden. Sociaal kapitaal wordt hier gezien als de middelen ingebed in sociale netwerken. Welzijn wordt onderzocht zowel op individueel niveau, in de vorm van subjectieve tevredenheid, als op gemeenschapsniveau, door middel van het niveau van misdaad en zelfdoding. Om de sterkte en intimiteit van sociale banden te conceptualiseren, wordt het onderscheid tussen bonding en bridging sociaal kapitaal gebruikt. Bonding kapitaal verwijst naar de ondersteunende middelen ingebed in nauwe en sterke banden tussen gelijken, zoals familie en goede vrienden, terwijl bridging sociaal kapitaal bestaat uit de informatieve en instrumentele middelen ingebed in zwakkere banden tussen sociaal of cultureel verschillende mensen.

Een eerste belangrijk punt is de mate waarin sociale relaties zelf beïnvloed worden door hun context. Ondanks sterke tendensen tot homofilie, heeft een diverse context een extra invloed op persoonlijke netwerk diversiteit. Dit illustreert dat zwakke sociale relaties voor een deel lokaal zijn, en de geografische context nog steeds een rol speelt in hun samenstelling in dit tijdperk van globalisering en virtuele sociale netwerken.

Nauwe en intensieve banden, die emotionele steun leveren, zijn de belangrijkste factor in het verklaren van individuele subjectieve welbevinden. Samenwonen met een partner is een centrale indicator van bonding kapitaal. Grote sociaal-economische ongelijkheden oefenen een negatieve invloed uit op het welbevinden, zelfs als men een betere maatschappelijke positie heeft. Terwijl subjectief welbevinden direct en indirect sterk beïnvloed door de kwaliteit, meer dan de hoeveelheid van bonding sociaal kapitaal, zijn contextuele effecten beperkt en treden deze enkel op bij grote ongelijkheden tussen gemeenschappen.

Als we het niveau van analyse van het individuele welbevinden naar het welzijn van gemeenschappen verschoven, zijn twee klassieke indicatoren die samenhangen met de levenskwaliteit, zelfmoord en criminaliteit, en hun relatie met sociale integratie onderzocht. Sociale integratie bestaat uit de gemeenschapsaspecten van sociale relaties in verschillende levensdomeinen. Zelfdodingscijfers zijn hoger in gemeenschappen met een hoger aandeel van alleenstaanden, een oudere bevolking en een negatieve netto migratie. Deze elementen samen geven een hoger risico op sociaal isolement, een vruchtbare bodem voor suïcidaal gedrag.

Criminaliteit aan de andere kant is eerder gerelateerd aan een hogere inkomensongelijkheid en werkloosheid, indicatoren voor achterstelling en uitsluiting van de arbeidsmarkt. Zowel zelfdoding en vermogensdelicten kunnen gezien worden als besmettelijke verschijnselen, in de zin dat gemeenschappen beïnvloed worden door het niveau van zelfdoding en misdaad in hun directe omgeving. Terwijl dit voor zelfdoding kan wijzen in de richting van imitatie, of van een hogere tolerantie en acceptatie voor zelfdoding in streken met hoge cijfers, zou dit besmettingseffect voor criminaliteit kunnen wijzen op de mobiliteit van de misdaad, die zich manifesteert als een spill-over effect. Geweldsmisdrijven zijn niet besmettelijk, maar lijken ruimtelijk geconcentreerd te zijn in streken groter dan een gemeente.

Samenvattend kan worden gesteld dat sociale relaties verbonden zijn met verschillende indicatoren van welbevinden. Subjectief individueel welbevinden wordt sterk bepaald door bonding sociaal kapitaal, terwijl het welzijn van gemeenschappen eerder verband houdt met sociale integratie in de private of publieke sfeer voor respectievelijk zelfmoord en criminaliteit.

Synthèse

Cette thèse étudie le rôle du capital social et du contexte dans le bien-être. Nous considérons le capital social à partir des ressources qui sont incorporées dans les réseaux sociaux. Le bien-être est étudié au niveau individuel sous la forme de satisfaction de vie, et à l'échelle communale par la criminalité et le taux de suicide. Pour conceptualiser la force et la proximité des liens sociaux, nous distinguons le capital social d'intermédiarité (*bridging social capital*) et le capital social d'homogénéité (*bonding social capital*). Le capital social d'homogénéité fait référence aux ressources de soutien intégrées dans des liens intimes et solides entre des acteurs qui partagent certaines caractéristiques. Ces liens existent principalement dans les cercles familiaux et amicaux. Pour sa part, le capital social d'intermédiarité se compose des ressources informationnelles et instrumentales intégrées dans des liens plus faibles entre les personnes socialement ou culturellement différentes.

Notre premier résultat concerne la manière dont les relations sociales sont influencées par le contexte dans lequel elles ont lieu. Nous pouvons affirmer que, malgré de fortes tendances homophiliques, un contexte diversifié a une influence supplémentaire sur la diversité des réseaux personnels. Ceci montre que les liens faibles sont aussi en partie locaux, et que le contexte géographique joue encore un rôle dans leur composition malgré la croissante mondialisation et l'essor des réseaux sociaux virtuels.

Les liens proches et intensifs, offrant un soutien émotionnel, sont le facteur le plus important dans l'explication du bien-être subjectif individuel. Vivre avec un partenaire peut être considéré comme l'indicateur central des liens d'attachement. Les grandes inégalités socio-économiques ont une influence négative sur le bien-être, même pour ceux qui occupent une meilleure position sociale. Ainsi, le bien-être subjectif est directement et indirectement influencé par la qualité, plus que la quantité, du capital social affectif qu'on les acteurs. Les effets contextuels sont limités et ne se produisent pas lorsque de grandes inégalités entre les communautés existent.

Lorsque nous passons du bien-être individuel au bien-être communautaire, nous étudions la relation entre deux indicateurs classiques liés à la qualité de vie communale (le suicide et le crime) et l'intégration sociale. L'intégration sociale se compose des aspects des relations sociales dans différents domaines de la vie au niveau de la communauté. Les taux de suicide

ont tendance à être plus élevés dans les communautés où on observe des proportions plus élevées de célibataires, une population plus âgée et un solde migratoire négatif. Ensemble, ces éléments indiquent un risque plus élevé d'isolement social, un terrain fertile pour le comportement suicidaire. D'autre part, la criminalité est davantage liée à l'inégalité des revenus et au chômage, indicateurs de privation et d'exclusion du marché du travail. Les taux de suicide et de criminalité contre les biens peuvent être considérés comme un phénomène contagieux au niveau communautaire, dans le sens où les communautés sont influencées par le niveau de suicide et de criminalité de leur environnement direct. Alors que pour le suicide cela pourrait pointer dans la direction de l'imitation, ou du moins d'une plus grande tolérance et acceptation de suicide dans les régions où les taux sont élevés, l'effet de contagion des taux de criminalité contre les biens pourrait pointer vers la mobilité de la criminalité, qui se manifeste comme un effet débordement. Le taux des crimes violents ne sont pas contagieux, mais semblent être spatialement concentrée dans des régions plus grandes qu'une municipalité.

En résumé, on peut avec confiance affirmer que les relations sociales sont liées à différents indicateurs du bien-être. Le bien-être subjectif individuel est lié au capital social d'homogénéité, tandis que le bien-être communal est davantage associé à l'intégration sociale dans le domaine public ou privé pour le suicide et les taux de criminalité, respectivement.

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