

Social and physical disorder

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# **SOCIAL AND PHYSICAL DISORDER**

How community, business presence and entrepreneurs  
influence disorder in Dutch neighborhoods

## **SOCIALE EN FYSIEKE OVERLAST**

Hoe gemeenschap, bedrijvigheid en ondernemers  
overlast in Nederlandse buurten beïnvloeden

(met een samenvatting in het Nederlands)

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# Chapter 1

## INTRODUCTION



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## 1.1 Background and research question

For several years now, the Dutch government has been especially concerned with neighborhood social and physical disorder: a neighborhood's social and physical conditions that are considered troublesome and potentially threatening (Perkins and Taylor 1996; Taylor 1999). Although not considered as serious as (e.g.) armed robbery, disorder is still an important problem, because it is so pervasive in many urban neighborhoods. In addition, physical disorder (e.g., vandalism) can be detected after the fact while many more serious deviant acts can only be perceived when the act itself is taking place. Moreover, signs of disorder may be a prelude to more serious crime (Wilson and Kelling 1982).

From 2000 onwards Dutch governments have tried to improve the general 'livability' of neighborhoods, of which troublesome and potentially threatening physical and social conditions are one part. In 2003, minister Kamp of the ministry of Housing, Spatial Planning and the Environment announced a program to improve 56 Dutch neighborhoods located in thirty of the largest Dutch cities (VROM 2003). In 2006, minister Winsemius changed this selection to 140 neighborhoods, and in 2007 minister Vogelaar refocused governmental efforts on the 40 most disadvantaged Dutch neighborhoods (EZ 2008).

A major focus in these plans for improvement is the juxtaposition of 'living' and 'working' in the neighborhood (VROM 2007). The presence of firms and local business ownership is thought to improve the neighborhood: "Entrepreneurship and businesses contribute significantly to the strength of a neighborhood. They create new jobs and economic growth. They contribute to mutual solidarity between residents and create new opportunities for individuals. Entrepreneurship also promotes integration and employment and thereby empowers vulnerable groups. Businesses contribute to the livability of a neighborhood by investing in their establishment and local environment (i.e., to make or keep it clean, well-maintained and safe) and by providing services to residents" (EZ 2008).

Evidence for these statements is, however, hard to find. Jacobs (1961) indeed argues that business presence (under certain circumstances) leads to a regular flow of people on the street, thereby stimulating 'normal' use and providing 'eyes on the street'. In contrast, empirical studies (e.g., McCord, Ratcliffe, Garcia, and Taylor 2007; Wilcox, Quisenberry, Cabrera, and Jones 2004) often find that business presence is related to more physical disorder (e.g., graffiti) and social disorder (e.g., panhandling). Moreover, there is almost no research on individual actions by local entrepreneurs to make the neighborhood safer or cleaner.

This dissertation, a collection of five research papers, addresses these issues. The effect of neighborhood community characteristics and the effect of business

(i.e., firm, entrepreneur) characteristics on a neighborhood's social and physical disorder are investigated. The overarching research question of this dissertation is:

*How can neighborhood differences in social and physical disorder be explained, and what is the relative contribution of neighborhood community, business presence and entrepreneurs to social and physical disorder in neighborhoods?*

## 1.2 Overarching research program

This dissertation is part of a larger research program, "Life chances of firms and neighborhoods: conditions and consequences of the interdependencies between local entrepreneurs and neighborhood residents", which aims to describe and explain the relationships between firms, local entrepreneurs and residents in a neighborhood, the conditions for their mutual dependencies as well as their consequences for neighborhoods' and firms' life chances.

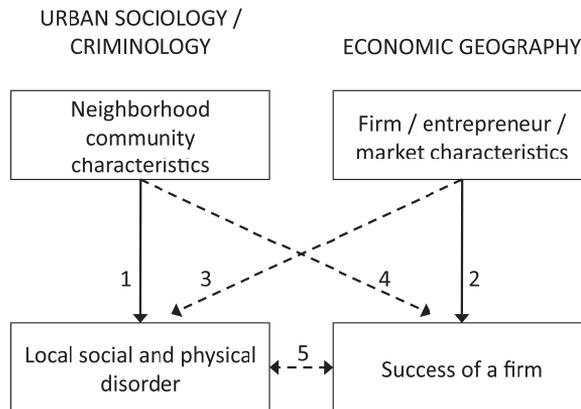


Figure 1.1 Overview of the overarching research program

The research program is the result of a combination of research questions in the field of urban sociology, criminology and economic geography. Research in the field of *urban sociology* and *criminology* has shown that neighborhood communities, i.e., dense social networks consisting of strong ties, are important to counter social and physical disorder (see arrow 1 in figure 1.1). However, the argument that firms and the activities they employ also affect a neighborhood's 'success' is not yet systematically investigated (see arrow 3 in figure 1.1). Whereas previous scholars have related business presence to physical and social disorder, the actors themselves, i.e., employees and business owners, have been overlooked. Furthermore, *economic geography* teaches that characteristics of such firms, the entrepreneurs, as well as the market affect firm success (see arrow 2), while the role of social neighborhood characteristics, such as the degree to which the neighborhood constitutes a local community, is still unknown. These local social characteristics may constitute important conditions for the explanation of firm success (see arrow 4). Finally, there

may be interdependencies between social and physical disorder in neighborhoods and success of firms (arrow 5). For example, the degree to which a neighborhood is safe influences a firm's success because clients are attracted by such a neighborhood.

This dissertation focuses on one part of the research program, namely arrow 1 and arrow 3 in figure 1.1. Ongoing work by Bart Sleutjes (currently a PhD student at the department of Geography of Utrecht University) and Gerald Mollenhorst (currently an assistant professor at the department of Sociology of Utrecht University) focuses on respectively arrow 2 and 4, and arrow 5.

### 1.3 Overview of chapters

This book is a collection of five research papers, in which we aim to improve on current explanations of social and physical disorder by (a) *testing* current neighborhood-level theory with longitudinal data; (b) *extending* current neighborhood-level theories by investigating the effect of firm presence and firm size in the explanation of disorder; (c) *improve* upon current neighborhood-level theories by investigating individual-level mechanisms of social control. The next sections introduce each of the five papers, and discuss their connection to each other and to the overarching research program.

#### 1.3.1 Testing social disorganization theory

Chapter 2 focuses on the 'traditional' explanation of physical and social disorder in the neighborhood: the community of neighborhood residents (i.e., arrow 1 in figure 1.1). *Social disorganization theory* is arguably the most prominent criminological theory regarding neighborhood disorder and crime. The theory argues that neighborhoods with greater population turnover, lower socioeconomic status and more ethnic heterogeneity are more likely to experience disorder (Bursik and Gasmick 1993; Shaw and McKay 1969). An important explanation for this relationship is the differential ability of residents to organize themselves to achieve common goals, e.g., a clean and safe neighborhood (Sampson, Raudenbush, and Earls 1997). Scholars argue that if neighborhood residents can organize themselves, i.e., form a community, this will result in informal social control and therefore potential offenders will either refrain from offending or be stopped in the process.

Wilson and Kelling (1982) argue in their 'broken windows' theory, as well as Skogan (1990) in the 'disorder and decline' model, that disorder in turn affects the development or maintenance of social ties and the extent to which residents exercise social control on deviants. That is, over time an increase in physical disorder may erode residents' cohesion as well as the processes of social control (e.g., Robinson, Lawton, Taylor, and Perkins 2003) and may also cause residents to leave the neighborhood (Liska and Bellair 1995). More population turnover, less cohesion and less social control in turn lead to more physical disorder and social disorder.

The extended model of social disorganization theory (i.e., in which structural neighborhood characteristics lead to disorder but disorder in turn leads to changes

in these characteristics) has only occasionally been tested empirically, because longitudinal data are rare. Information on social cohesion, social control, and disorder at the neighborhood level is not readily available for multiple time points of the same neighborhood. With a longitudinal neighborhood-level dataset of the Dutch city of Utrecht ( $N = 74$  neighborhoods, spanning ten years) we *are* able to empirically test this extended model in chapter 2. We use structural equation models to investigate the effect of neighborhood characteristics on disorder, the mediation of this effect by social cohesion and social control, and potential feedback effects of disorder on turnover, cohesion and control. In this way, we are able to test ‘old’ ideas using ‘new’ methods and data.

### 1.3.2 Firms and employees as explanations of neighborhood disorder

Chapter 3 adds the presence of businesses as an explanation of social and physical disorder (i.e., arrow 1 *and* arrow 3 in figure 1.1). We derive hypotheses from *routine activity theory* regarding the effect of businesses on social and physical disorder, while controlling for the explanations of social disorganization theory. Routine activity states that for any deviant act to occur, motivated offenders must have contact with suitable targets in the absence of capable guardians (Cohen and Felson 1979). In addition, most deviance occurs during the routine activities that people conduct in their daily lives, such as working and shopping. Thus, offenders and targets converge in space and time because of their daily activities. In this third chapter, we examine to what extent (different types of) businesses are suitable places, i.e., places that are most conducive to such convergence, by empirically investigating the relationship between business presence and social and physical disorder. Specifically, we investigate liquor stores, bars, fast food establishments, supermarkets and high schools.

We extend previous studies by examining the role of employees in these neighborhood businesses. On the one hand, employees might be more important for a neighborhood’s order than residents: in a neighborhood with businesses and a high employment rate of residents, there may be more business employees present than residents during working hours. Acting as ‘place managers’, these employees may be better able to prevent disorder than the neighborhood residents (Clarke 1992; Felson 1986; 2002). On the other hand, the businesses where these employees work may attract more potential offenders who would not have come to the neighborhood had there not been a business to visit in the first place. Lastly, we investigate whether the effect of business presence in disadvantaged neighborhoods differs from the effect of business presence in well-to-do neighborhoods.

In this chapter, we combine data from different sources to test our hypotheses across 278 Dutch neighborhoods in the four largest cities of the Netherlands. Using multivariate multilevel analysis we investigate the relationship between firm presence, the size of these firms, and social disorder and physical disorder in urban neighborhoods. In all analyses, we investigate the extent to which business presence adds to the explanations of disorder as argued by social disorganization theory (i.e., poverty, residential mobility, and ethnic heterogeneity).

### 1.3.3 Measurement of neighborhood-level characteristics

The explanations of neighborhood disorder in chapter 2 and chapter 3 entail concepts such as social cohesion and mutual trust. Such concepts, however, are not measurable in the same way as, e.g., population turnover: one cannot easily 'count' social cohesion. Instead, many studies ask neighborhood residents to give their opinions on the social cohesion, and these opinions are aggregated to form a neighborhood-level 'score'. The way in which we aggregate these individual opinions to the neighborhood level is discussed more extensively in chapter 4. More precisely, chapter 4 serves as the methodological companion to chapter 2 and chapter 3, and as an interlude between the neighborhood-level studies and the individual-level studies in this dissertation.

Chapter 4 first describes the 'ecometrics' method (Raudenbush and Sampson 1999) of aggregation, which was used in chapter 2 and chapter 3, more extensively. Second, we compare the neighborhood 'scores' which result from such 'ecometrics' aggregation to 'scores' which result from taking the mean across all neighborhood respondents (the 'traditional' method of aggregation). We use the recent discussion about the selection of the forty most disadvantaged Dutch neighborhoods (EZ 2008) to show the importance of the method of aggregation.

### 1.3.4 Individual actions by residents on behalf of the neighborhood

In chapter 5, we again focus on the traditional explanation (i.e., arrow 1 in figure 1.1) but we also aim to improve upon this explanation. Social disorganization theory argues that several neighborhood characteristics (i.e., socioeconomic status, population turnover, and ethnic heterogeneity) affect the level of social cohesion, which results in social control (Bursik and Grasmick 1993). Sampson et al. (1997) reformulated social cohesion, mutual trust and social control into one neighborhood-level concept: collective efficacy. Sampson et al. (1997) argue that this neighborhood-level version of self-efficacy (Bandura 1977), the *capacity for collective organized action* on behalf of the neighborhood, is the key determinant of disorder and crime in the neighborhood.

In chapter 5, we argue that such neighborhood-level explanations can be improved by acknowledging that many acts of social control are independently done by individual residents. Neighborhood-level explanations neglect the choice situation of the individual actor. More precisely, we empirically investigate the relationship between an individual's expectations that others are willing to exercise social control, and the individual's own willingness to exercise social control.

Because social disorganization theory does not provide strong arguments on the behavior of independently acting individual residents, we use the game-theoretical model of the 'volunteer's dilemma' (Diekmann 1985) to model the decision situation. Based on the volunteer's dilemma, we derive hypotheses with regard to the willingness of an individual to take action to remedy problematic neighborhood situations, i.e., act on behalf of the public good. We use survey data of residents in 161 Dutch neighborhoods (SSND2) to empirically test the hypotheses.

### 1.3.5 Comparing guardianship and place management

Mixed land use, or the presence of businesses in residential neighborhoods, is often associated with more local crime and disorder. As such studies focus on places (e.g., neighborhoods, tracts, cities) and then correlate firm presence to disorder, the exact mechanisms behind this finding remain unclear. Chapter 6 investigates one possible mechanism at the individual level: informal social control by residents and local business owners. Local business owners, residents who have their business and live in the same neighborhood, are not only ‘guardians’ but also ‘place managers’ (Eck and Weisburd 1995). In this way, we again juxtapose the traditional ‘community’ explanation of disorder and the presence of neighborhood businesses (i.e., arrow 1 *and* arrow 3 in figure 1.1), but we investigate this on the individual level.

This chapter explicitly *compares* residents and local business owners: we investigate whether local business owners are relatively (a) more willing to intervene in local problem situations, and whether they are relatively (b) more likely to engage in social and social control activities with their neighbors. To test hypotheses, we use the SSND2 (see chapter 5) combined with a dataset on local business owners (SSNE) ( $N = 895$  residents, 385 entrepreneurs, and 161 neighborhoods).

### 1.3.6 Summary

In short, this dissertation aims to explain neighborhood differences in social and physical disorder, and questions to what extent neighborhood firms and entrepreneurs play a role in this explanation. The next chapters are structured as follows (see figure 1.2).

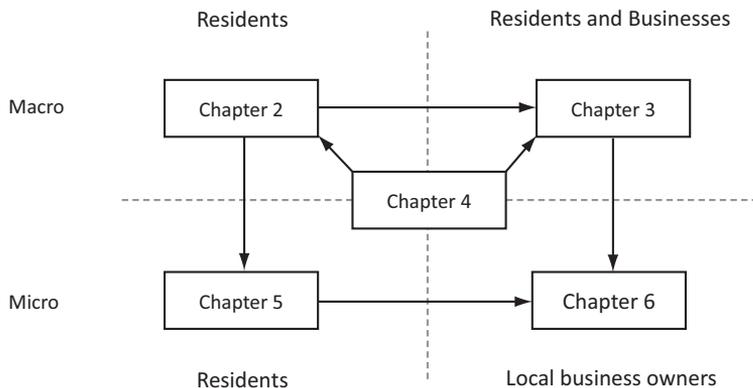


Figure 1.2 Structure of dissertation

First, we empirically investigate the neighborhood level in chapter 2 and chapter 3. Thereby we connect our research to previous studies, as these have mostly been conducted on the neighborhood-level as well. In chapter 2, we investigate current neighborhood-level theory which focuses on the role of informal control by neighborhood *residents*. This leads to chapter 3, in which we extend this investigation by including neighborhood *businesses*. Chapter 4 is a methodological companion to

Table 1.1 Overview of chapters in this dissertation: main dependent variable, aim of study and research questions, and data source(s)

Chapter	Main dependent variable	Aim of study and Research questions	Data
2	Social and physical disorder	<p>Test of neighborhood-level social disorganization theory</p> <p>a) Do population turnover, socioeconomic status, and ethnic heterogeneity increase social and physical disorder?</p> <p>b) To what extent are these effects mediated by social cohesion, potential for social control, and actual social control behavior?</p> <p>c) To what extent does social and physical disorder affect population turnover, social cohesion, and social control?</p>	Statistics Netherlands (CBS) 1995-2005, Nieuw Utrechts Peil (NUP) 1996-2006
3	Social and physical disorder	<p>Effect of business presence on social and physical disorder</p> <p>a) Controlling for explanations of social disorganization theory, do (different types of) businesses affect social and physical disorder?</p> <p>b) Does a higher number of employees decrease social and physical disorder?</p> <p>c) Is the effect of business presence (of different types and sizes) especially detrimental for already disadvantaged neighborhoods?</p>	Statistics Netherlands (CBS) 2004, Landelijk InformatieSysteem Arbeidsplaatsen (LISA) 2004, Police Population Monitor (PPM) 2005
4	Social and physical disorder	<p>Methodological chapter concerning aggregating respondents' opinions</p> <p>a) By which methods can residents' opinions about the neighborhood be aggregated to one neighborhood score?</p> <p>b) Does the 'ecometrics' method of aggregation lead to different results than the 'traditional' method of aggregation?</p>	Police Population Monitor (PPM) 2005
5	Willingness to intervene in problematic situations (disorder; crime)	<p>Investigate individual-level mechanisms of social disorganization theory</p> <p>a) Do perceived population turnover, ethnic heterogeneity, and individual 'stakes' affect one's willingness to intervene in disorder and crime?</p> <p>b) What is the relationship between one's expectations about the behavior of other residents and one's own willingness to intervene?</p>	Survey of the Social Networks of the Dutch, 2nd wave (SSND2)
6	Willingness to intervene in problematic situations (disorder; crime); engaging in (social and social control) activities with neighbors	<p>Comparison of residents and local business owners</p> <p>a) Are local business owners more willing to intervene in disorder and crime, and more likely to participate in activities with neighbors?</p> <p>b) To what extent can differences be explained by individual differences in expectations about the behavior of others, and self-efficacy?</p>	Survey of the Social Networks of the Dutch, 2nd wave (SSND2), Survey of the Social Networks of Dutch Entrepreneurs (SSNE)

chapter 2 and chapter 3 and serves as a transition between the neighborhood-level studies and the individual-level investigations in chapter 5 and chapter 6.

Chapter 2, with the focus on neighborhood-level theory with regard to informal social control of residents, influences chapter 5. In chapter 5 we also focus on residents, but we investigate the individual-level willingness to exercise social control. Because the aggregated willingness to exercise social control is deemed the most important neighborhood-level explanation of disorder, chapter 5 aims to improve on current theory by investigating whether the neighborhood-level predictions hold for individual action. Chapter 6 pursues the same issue, but extends the investigation further by comparing residents (i.e., guardians) to local business owners (i.e., people who combine the roles of guardianship and place management) with regard to the willingness to exercise social control as well as participation in activities with neighbors. Chapter 6 is thus influenced both by chapter 5 (with its focus on individual action) and by chapter 3 (with its juxtaposition of residents and businesses). Table 1.1 gives an overview of the main dependent variable, aim of study, research questions, and data used in each chapter.

## Chapter 2

### A LONGITUDINAL TEST OF SOCIAL DISORGANIZATION THEORY

FEEDBACK EFFECTS BETWEEN COHESION,  
SOCIAL CONTROL AND DISORDER



This paper was co-authored by John R. Hipp. A revised version of this chapter is forthcoming in *Criminology*.

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# A longitudinal test of social disorganization theory

## 2.1 Introduction

There are various reasons why people want to avoid neighborhoods with high levels of social or physical disorder. Disorder refers to the social and physical conditions in a neighborhood that are considered troublesome and potentially threatening (Perkins and Taylor 1996; Taylor 1999). Social disorder includes such undesirable behaviors as drinking in public, threatening behavior, or people getting bothered on the street, whereas physical disorder refers to physical deterioration of the neighborhood, including vandalism and graffiti. Although the seriousness of disorder is relatively low compared to other deviant acts (Rossi, Waite, Bose, and Berk 1974), the chance of encountering physical disorder (e.g., litter) in one's daily life is much higher than, e.g., witnessing a robbery. Moreover, signs of disorder may be a prelude to more serious crime (Skogan 1990; Wilson and Kelling 1982).

Social disorganization theory (Shaw and McKay 1969) argues that neighborhoods with greater population turnover, lower socioeconomic status, and more ethnic heterogeneity are more likely to experience disorder. An important explanation for this relationship is the differential ability of residents to organize themselves to achieve common goals, e.g. a clean and safe neighborhood. Thus, the mechanism of informal social control and sanctioning is crucial for explaining the level of disorder in neighborhoods. Scholars argue that if neighborhood residents can organize themselves, this will result in 'informal social control' –the informal regulatory behavior of others– and therefore potential offenders will either refrain from offending or be stopped in the process.

This paper makes two contributions to this current explanation of neighborhood disorder using recent neighborhood-level panel data from the Netherlands. First, we investigate two types of social control, namely (1) feelings of responsibility for the neighborhood and (2) actual social control activity. Prior research has not clearly delineated between *potential* for informal social control, and *actual* social control behavior. Instead, prior research often focused on the expectations of intervention by others (inter alia Sampson, Raudenbush, and Earls 1997), or even the percentage of people reporting neighborhood satisfaction or organizational membership (Markowitz, Bellair, Liska, and Liu 2001). In this study we have the unique opportunity to simultaneously include the shared feelings of responsibility for the neighborhood, as well as a direct measure of actions undertaken by respondents to improve the livability and safety of their neighborhood.

Second, by using a neighborhood-level panel dataset spanning ten years, we are able to better study the social processes posited by these theories. Almost all stud-

ies have used cross-sectional data to make inferences about these causal effects. At best, studies employ predictor variables which preceded the response variable by one year in time. Only a few papers, namely Sampson and Raudenbush (1999), Bellair (2000), Markowitz et al. (2001), and Robinson et al. (2003) explicitly modeled reciprocal relationships between crime and its social conditions. However, in these studies the number of time points is still very limited with just one time point (Sampson and Raudenbush 1999) or two time points (Robinson, Lawton, Taylor, and Perkins 2003), or have long intervals between time points of four and eight years (Markowitz, Bellair, Liska, and Liu 2001). In short, the proposed mediating mechanisms of social disorganization theory have rarely been studied using proper longitudinal data, let alone taking into account the feedback effects of disorder back onto these mechanisms or the structural characteristics. Community-level panel data is lacking, and this has precluded the testing of the longitudinal theory of precisely the type that Shaw and McKay (1969) and Skogan (1990) envisioned. In this study, we are able to investigate these issues by using a bi-annual community-level panel dataset spanning ten years (i.e., six time points). Thus, we are able to simultaneously investigate ‘feedback’ effects from disorder on subsequent population turnover, social cohesion and social control.

This paper takes the following course. In the upcoming theory section, we discuss the explanation of neighborhood disorder by social disorganization theory and discuss empirical findings of previous research. Specifically, we discuss mediation effects of social cohesion and social control, as well as possible feedback effects of disorder, and make note of the most obvious shortcomings. Next, we discuss the neighborhood-level panel data from the Netherlands which we use to improve upon previous research. The results section provides descriptive statistics of the data, as well as explanatory path analyses. In the discussion we give general conclusions and reflect on our study, ending with implications and proposals for future research.

## 2.2 Theory

### 2.2.1 Social disorganization theory

Social disorganization theory, originally formulated by Shaw and McKay in 1942 which in turn was based on older ideas by Park and Burgess, has re-emerged as one of the major theoretical perspectives in the study of deviance (Markowitz, Bellair, Liska, and Liu 2001; Pratt and Cullen 2005), and has successfully been applied to explain violent crime (Sampson, Raudenbush, and Earls 1997), delinquency (Sampson and Groves 1989), and disorder (Sampson and Raudenbush 1999).<sup>1 2</sup> The basic

- 1 Sampson and Groves (1989) used “the percentage of residents who reported that disorderly teenage peer groups were a ‘very common’ neighborhood problem” as a mediating variable to explain crime rates, which they proposed as an indicator of the extent to which the community is unable to control peer-group dynamics. In later research, this measure was used not as an indicator of community organizational ability, but as an outcome in itself: delinquency. Here we follow the more recent convention and thus describe their paper as a test of social disorganization theory with respect to delinquency.
- 2 Sampson and Raudenbush (1999) argue that the logic of their analytic approach shares more affinity with routine activity theory than with social disorganization theory. Indeed, (Shaw and McKay 1969) thesis

premise of social disorganization theory is that neighborhoods with high population turnover, low socioeconomic status, and a high level of ethnic heterogeneity, experience more disorder than other neighborhoods (*Hypothesis 1*). The underlying mechanism is that people in these neighborhoods are less able to organize themselves against threats, e.g., disorderly behavior, than other neighborhoods. The residents themselves may move to and from the neighborhood, but the characteristics at the *neighborhood* level persist, and thus these neighborhoods remain socially disorganized (Shaw and McKay 1969).

More precisely, the ability of neighborhood residents to combat collective problems is perceived to originate from social cohesion which fosters social control (see inter alia Bursik and Grasmick 1993; Sampson and Groves 1989; Sampson, Raudenbush, and Earls 1997).<sup>3</sup> Bad housing quality causes residents to move out of undesirable neighborhoods when it is economically feasible for them to do so. Such residential mobility impedes the formation and maintenance of stable relationships, which are necessary for social control and social cohesion. Ethnic heterogeneity, partly a result of residential mobility, impedes communication between neighborhood groups, and thus shared norms cannot be established due to mistrust or the presence of different norms for the different groups of people. In addition, cultural transmission of deviant values occurs easily in such neighborhoods (Bursik and Grasmick 1993; Pratt and Cullen 2005; Shaw and McKay 1969).

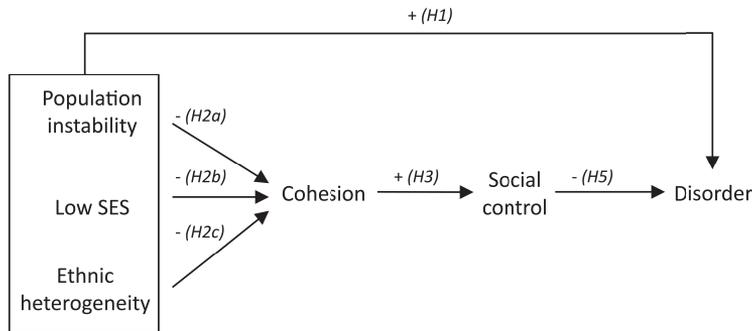


Figure 2.1 Traditional social disorganization model

involved the production of offenders by neighborhood conditions. However, more recent developments of the theory also generalize the theory to the neighborhoods themselves as units of control or guardianship, regardless of where offenders may reside. Indeed, (Sampson and Groves 1989) discuss the theory in this manner without ever referring to routine activity theory.

- 3 Informal social control is informal regulatory behavior of the actions of others. More specifically, the relevant research that aims to explain neighborhood differences in disorder is concerned with parochial control, which refers to “relationships among residents that do not have the same sentimental basis as affective networks” (Bursik and Grasmick 1993, p. 35). Three types of such social control are identified: (1) informal surveillance: that is, observation of neighborhood streets that is engaged in by individuals during daily activities, (2) movement-governing rules with regard to which areas to avoid, and (3) direct intervention, e.g., questioning strangers about suspicious activities or chastening children for unacceptable behavior. In the body of research relevant to the present study, authors generally refer to social control of the first or the third type.

In summary, figure 2.1 shows that the neighborhood structural characteristics of ethnic heterogeneity, residential stability, and economic disadvantage affect social cohesion (*Hypothesis 2abc*), which in turn affects the social control (*Hypothesis 3*) which ultimately affects the level of disorder (*Hypothesis 5*). The arrows are numbered to respond to the hypotheses in question.<sup>4</sup>

## 2.2.2 Mediation by cohesion, potential and actual social control

Previous research grounded in social disorganization theory generally draws similar conclusions, namely that cohesion and social control mediate the effects of structural neighborhood characteristics on deviance. However, there is considerable variation in how social cohesion and social control are measured in these studies. For example, Sampson and Groves (1989) find that neighborhoods with more ‘social ties’ and greater ‘participation in organizations’ experience less crime, while the presence of disorderly teenage groups was associated with more crime. Given that some would define the presence of teenagers hanging out on street corners as a measure of social disorder, we might have expected that social ties and organizational participation would have a causal effect upon the presence of such disorder. Bellair (1997) found that neighborhoods with more ‘social interaction’ (i.e., visiting with their neighbors) had lower levels of disorder. Warner and Rountree (1997) found that greater levels of ‘neighboring activities’ were related to lower assault rates, but found no evidence that these mediated the relationship between neighborhood structural characteristics and assault rates. Sampson, Raudenbush, and Earls (1997) found that a combined measure of cohesion, mutual trust, and expectations of intervention by others (which they labeled ‘collective efficacy’) reduced violent crime rates, and this also partly mediated the effect of neighborhood structural characteristics. Lastly, Markowitz et al. (2001) found significant relationships between neighborhood structural characteristics and disorder, which were mediated by ‘cohesion’ and ‘social control’.

What becomes clear from this overview of previous studies is that a conceptual overview of these different operationalizations is currently lacking. We identify five different ways in which previous studies have measured social control: (1) a respondent’s ‘expectation of intervention behavior on the part of other residents’ aggregated to the neighborhood level; (2) ‘participation in neighborhood organizations’ (through which either the respondent is expected to exercise more social control himself due to his participation, or the level of participation in organizations is a proxy for the mobilization capacity of the neighborhood); (3) ‘attachment, social ties, or cohesion’ (assuming that these lead to more intervention or informal surveillance).<sup>5</sup> In addition, recent studies have included a combined measure of

4 Note: the hypothesis concerning the effect of social control on disorder is hypothesis number 5, because the model is currently incomplete. In the next section, we will extend the model depicted in figure 2.1. An extra effect, which precedes the effect of social control on disorder in time, will then be captured by hypothesis number 4.

5 Participation in organizations is arguably a form of ‘public’ social control (Bursik and Grasmick 1993, p. 17). However, it is often unclear, and untested, if participation in organizations leads to more actions by each of the organization’s members, or that the organization itself is expected to help combat collective problems.

cohesion, trust in others and expectations of intervention by others, termed (4) 'collective efficacy' (see Sampson, Raudenbush, and Earls 1997). Lastly, we define a 'miscellaneous' category in which social control is operationalized as some (5) combination of the previous four methods. For example, Markowitz et al. (2001) labeled their variable 'cohesion', though it is a combination of organization participation, helping behavior among neighbors, and satisfaction with the area. Though not quite the same as collective efficacy, as the latter concept requires a perception of what others will do, Markowitz' measure does combine cohesion and social control into one concept.

Although cohesion and informal social control are empirically related, we argue that these are two distinct constructs. It is important to distinguish between (a) *determinants* of informal social control, (b) the *potential* for informal social control in neighborhoods, and (c) *actual* informal social control behavior. First, we argue that 'cohesion' causally affects, but is not a necessary or sufficient precondition of 'social control'. For example, deprived neighborhoods with strong interpersonal networks and a sense of belonging may also have greater tolerance towards disorder and crime. In such neighborhoods, people may look out for others and help each other in times of need, but there are no 'shared expectations of intervention in deviant behavior'. Conversely, in upper-class neighborhoods residents may not know their neighbors very well, but the residents do share mutual expectations of intervention when deviant acts occur. Thus, we argue it is theoretically sound to keep cohesion and social control decomposed into separate measures.

Second, we lament the fact that studies which aim to explain neighborhood differences in disorder frequently focus only on the *potential* of social control, but have not measured *actual behavior*, or 'direct intervention'. It is notable that the five operationalizations of social control we identified above do not focus on actual social control behavior to rid a neighborhood of disorder. We argue that it is important to distinguish between the potential for social control and actual social control behavior, because expectations that others will intervene (*potential* social control) need not necessarily result in people actually intervening more (*actual* social control behavior), even though this is implicitly assumed by social disorganization theory. Research on public good dilemmas provides arguments why expectations about intervention may lead to less actual intervention. Even though it is in the interest of each resident to exercise social control on others who misbehave, and thus help produce the collective good, it is rational to refrain from doing so if the resident expects others to exercise social control, because the individual resident then shares none of the burden but all of the profit (Coleman 1990). And because each resident makes such a rational decision and comes to the same conclusion, then in the end no one will *actually* intervene.

While we do not investigate the theoretical discrepancy between potential social control and actual social control on the individual level in this paper, given that it would be outside the scope of the present study, we do explore it provisionally with aggregated measures of the percentage of residents who feel responsible for the livability and safety of the neighborhood, and the percentage of residents who have actually taken action to improve the livability and safety of the neighborhood. In line with previous social disorganization studies we hypothesize that cohesion

positively affects the *potential* for social control, and we extend this hypothesis that cohesion also positively affects *actual* social control behavior (*Hypothesis 3*). In addition, we expect that a high *potential* for social control will result in more people *acting* on behalf of the common good, i.e., to reduce disorder (*Hypothesis 4*, see figure 2.2). We assume that potential offenders will infer from environmental cues that people have a shared sense of responsibility for the neighborhood (potential for social control) and thus they will not offend in the first place, and thus that the *potential* for social control will lead to less disorder. In addition, we expect that more people actually doing something to decrease disorder (actual social control behavior) will lead to less disorder. Thus, both the *potential* for social control and *actual* social control behavior is expected to decrease disorder (*Hypothesis 5*).

### 2.2.3 Feedback effects of disorder

Wilson and Kelling (1982) argued in their 'broken windows' theory, as well as Skogan (1990) in the 'disorder and decline' model, that disorder in turn feeds back onto the development or maintenance of social ties and the extent to which residents exercise social control on deviants. That is, over time physical disorder may erode residents' cohesion (*Hypothesis 6a*) as well as the processes of social control (*Hypotheses 6b and 6c*) (inter alia Markowitz, Bellair, Liska, and Liu 2001; Robinson, Lawton, Taylor, and Perkins 2003) and may also cause residents to exit the neighborhood (*Hypothesis 6d*) (Liska and Bellair 1995). This in turn leads to more physical disorder and social disorder.

Very few studies have explicitly modeled these feedback effects from disorder on social control, social cohesion, and population turnover. Here we focus on neighborhood-level studies; we refer the reader to Robinson et al. (2003) for an overview of both multi-level and neighborhood-level studies. Cross-sectional ecological analyses generally support the hypothesis that disorder reduces cohesion (*Hypothesis 6a*), for streetblocks (Kurtz, Koons, and Taylor 1998; Perkins and Taylor 1996), for neighborhoods (Skogan 1990) or other community areas (Liska and Warner 1991; Rountree and Land 1996).<sup>6</sup> In contrast, Hartnagel (1979) did not find that crime or fear of crime affected social cohesion or social activities. Taylor (2001) interviewed residents in Baltimore neighborhoods twelve years apart, and found that disorder led to more night-time fear as well as intentions to move away. Robinson et al. (2003) use data with two time points, and did not find significant lagged effects of disorder on block satisfaction or local safety trends. They could not test other outcomes, as they were impeded by the lack of between-neighborhood variation or block-level stability of the outcomes.

There is only minimal evidence for the effect of disorder on subsequent social control (*Hypothesis 6b/c*). Taylor (1996) used cross-sectional data and very cautiously concluded that in some neighborhoods, disorder may draw residents together. Sampson and Raudenbush (1999) found that more homicide and burglary both led to a decrease in collective efficacy. Bellair (2000) used cross-sectional data

<sup>6</sup> Some studies (e.g., Rountree and Land 1996) suggest a complex relationship between crime and cohesion, in which mediation by perceived risk as well as fear of specific types of crime plays a role. However, we are not able to test such fear-related or risk-related mechanisms in our study.

and found negative reciprocal relationships between robbery and assault and informal surveillance; however, after controlling for risk perception, results suggest that burglary increases surveillance behavior. Lastly, Markowitz et al. (2001) used three waves of the British Crime Survey using 300 or 151 neighborhoods (depending on the investigated time lag) and concluded that disorder (via fear) reduces cohesion (which they measured as a combination of the presence of neighborhood social ties, participation in voluntary organizations, and neighborhood satisfaction). Note that all but Bellair's study focused on the effect of disorder on subsequent *potential* for social control. Bellair's (2000) study suggests that some types of deviance may actually lead to more social control behavior – if there are more problems in the neighborhood, people will do more to solve those problems.

Although one study found no evidence that residents' *perceptions* about the amount of neighborhood crime affected subsequent moving (South and Deane 1993), most studies do find such effects. Crime may affect the total rate of turnover (Dugan 1999; Hipp, Tita, and Greenbaum 2009; Sampson and Wooldredge 1986), as well as the subsequent composition of the neighborhood (Liska and Bellair 1995; Liska, Logan, and Bellair 1998; Morenoff and Sampson 1997). We expect that more disorder leads to greater population turnover (*Hypothesis 6d*).

#### 2.2.4 Current study

The traditional explanations of social disorganization theory (figure 2.2, solid arrows) have received ample attention in the literature, but mostly by using cross-sectional data. One problem is that studies sometimes use very different operationalizations of social control. The 'disorder and decline' model, which extends the classical social disorganization theory by positing feedback effects back to the neighborhood demographics and cohesion and social control itself, has only occasionally been tested, and then mostly with regard to the effects of *crime* instead of disorder (figure 2.2, dashed arrows).<sup>7</sup> The primary reason for this state of affairs is that information on cohesion and control at the neighborhood level is not readily available. Ethnographic research is possible, but usually only focuses on a single neighborhood or the differences between a few neighborhoods. To quantify between-neighborhood differences and to assess mediation effects, we require surveys among many neighborhood residents per neighborhood and across many neighborhoods.

This research attempts to address the above issues. Our research focuses on (1) the direct effect of neighborhood characteristics on disorder, as well as the mediation of this effect by social cohesion and social control. With respect to social control, we investigate both the effects of *actions taken* by the residents as well as of the *responsibility felt* for the neighborhood. In addition, we (2) investigate the feedback effects of disorder (and fear) on turnover, cohesion, and control. We use a longitudinal neighborhood-level dataset, constructed from resident-based surveys coupled with official data on the neighborhoods at six different time points, with each time point two years apart (i.e., bi-annually, 1996-2006). Due to the relatively

<sup>7</sup> Here we will assume, based on theoretical notion by Skogan (1990) and empirical work by Sampson and Raudenbush (1999) that the results of these studies might also apply to the explanation of disorder.

low number of neighborhoods (n=74) and the large number of parameters, we cannot fully investigate time lag issues; we assume the temporal effects to be either one year or two years.

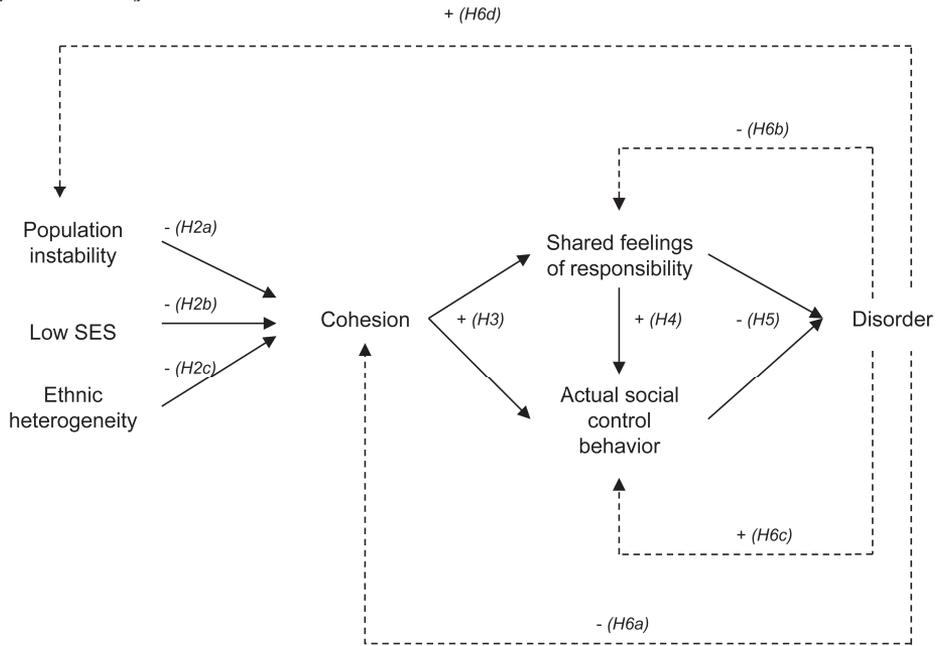


Figure 2.2 Extended social disorganization model, including feedback effects

## 2.3 Data and methods

### 2.3.1 Data

This study uses a *neighborhood-level* panel dataset to test the hypotheses. We constructed the dataset by combining official neighborhood data from Statistics Netherlands with the individual-level survey ‘Nieuw Utrechts Peil’ (NUP), provided by the Administrative Information Department, Administrative Affairs, City of Utrecht. Because this survey is a bi-annual cross-sectional survey, the same individuals were not interviewed in different years. This is not problematic because in this study we are interested in processes operating on the level of the neighborhood, and thus we aggregated individual-level responses to the neighborhood level.

What constitutes a neighborhood is always hard to define. In this particular survey, respondents were originally selected from each of the 29 districts or wards of Utrecht. However, more detailed information on respondent location was included as well, so we were able to use the ‘natural areas’ as defined by Statistics Netherlands. These neighborhoods are smaller and more homogeneous than the 29 districts, and are more in line with what a citizen of Utrecht would delineate as his or her neighborhood. This definition of neighborhood is thus arguably better than

either postal code areas or larger districts or wards. Lastly, Statistics Netherlands also gathers data on this level of aggregation, so the survey responses can also be easily combined with official neighborhood data (e.g., the percentage of migrants living in the neighborhood) without encountering data merging problems.

The bi-annual cross sectional NUP survey was conducted between 1996 and 2006 by the municipality of Utrecht, the Netherlands. For each wave, a sample of respondents is drawn from the latest municipal records, of which all respondents are required to have a valid (non-classified) home address, be older than 16 years of age, and not currently living in an institution. In addition, respondents who also participate in other surveys are excluded. Only one person per address is asked (by letter) to participate in the survey, and after agreement, the written questionnaire itself is sent by mail. In 2006, respondents were able to choose themselves whether they prefer to fill out the questionnaire on paper, or fill out an internet-based questionnaire.

The response rate was about 70% in 1996 and about 45% in 2006. In total 42,220 respondents were interviewed. To maintain a consistent neighborhood sample across all years, we excluded respondents who lived in areas which were only included in the last wave (e.g., a newly constructed neighborhood quite some distance from the city proper). In addition, we excluded the inner-city neighborhood (the neighborhood comprising the central train station and adjacent mall), business districts and the area where the university is located (outside the city proper), because social disorganization theory's focus is on residential areas. This resulted in a final dataset of 37637 respondents nested within 74 neighborhoods (5604 respondents in 1996, 6321 respondents in 1998, 6565 respondents in 2000, 6414 respondents in 2002, 7486 respondents in 2004, and 5247 respondents in 2006).

Each of these 74 neighborhoods had a mean of at least 10 respondents across all time points. One neighborhood had 7 respondents at one time point (but 14 respondents at another time point, thus resulting in a mean equal to or higher than 10), but excluding this neighborhood from our analyses did not influence our results. All other neighborhoods have at least 10 or more respondents for each time point, one neighborhood having as many as 202 respondents in each survey year. On average the neighborhoods had 77 respondents in 1996, 85 respondents in 1998, 89 respondents in 2000, 87 respondents in 2002, 101 respondents in 2004, and 71 respondents in 2006. Thus, we are confident that we can aggregate individual-level responses to the neighborhood level.<sup>8</sup>

### 2.3.2 Measurements

*Disorder* was measured by seven questions (on a three-point scale) with regard to how much of a problem a respondent perceived "graffiti on walls or buildings", "litter on the street", "dog feces on the street", "vandalism of, e.g., bus stops", "threatening behavior", "drunk people on the street", and "women and men getting bothered"

<sup>8</sup> In addition, we used 'econometrics' analysis to create some of our neighborhood level variables, thus explicitly taking sample size as well as individual perceptual bias into account. This is explained more fully in the next section.

on the street. As such, our disorder measure comprises both measurements of physical disorder as well as of social disorder, with an average Cronbach's alpha of .69 across all years and neighborhoods. Separate measures of social and physical disorder correlated too strongly to be justifiably separated.

*Cohesion* was reflected in eight different questions measured on a five-point scale ("completely disagree, disagree, not agree/not disagree, agree, completely agree"). The original cohesion survey questions were (translated from the original Dutch): "people in this neighborhood hardly know each other", "people in this neighborhood get along nicely", "people in this neighborhood like to keep living here", "it is tedious to live in this neighborhood", "I will move out of this neighborhood if possible", "if you live in this neighborhood, you are lucky", and "I feel at home with the people living in this neighborhood". The eight items scaled very well together with an average Cronbach's alpha of .85 across all years and neighborhoods.

For both disorder and cohesion, we used the 'ecometrics' method (Raudenbush and Sampson 1999), a hierarchical model to account for individual bias in the perception of the variables, to construct 'true' neighborhood measures. This hierarchical model has the response to the  $i$ th questionnaire item of the  $j$ th respondent in each neighborhood  $k$ , which depends on the 'difficulty' of an item and one's latent perception of the item plus error.<sup>9</sup> Thus, we are estimating a multilevel model with the following item-level equation:

$$(1) \quad y_{ijk} = \pi_{jk} + \Gamma D_{ijk} + \varepsilon_{ijk}$$

where  $y_{ijk}$  is the  $i$ th item of interest about the neighborhood reported by the  $j$ th respondent of  $J$  respondents in the  $k$ th neighborhood,  $D_{ijk}$  is the matrix of questionnaire items,  $\Gamma$  shows the 'difficulty' of these items in the data, and  $\pi_{jk}$  is the 'true' score for person  $jk$ , and  $\varepsilon_{ijk}$  is a disturbance term. Level 2 reflects the respondent-level:

$$(2) \quad \pi_{jk} = \eta_k + \Lambda X_{jk} + r_{jk}$$

where  $X_{jk}$  is a matrix of exogenous predictors with values for each individual  $j$  in neighborhood  $k$  that take into account possible biasing effects,  $\Lambda$  shows the effect of these predictors on the subjective assessment,  $\eta_k$  is the random neighborhood-level version of the measure, and  $r_{jk}$  is a disturbance term.<sup>10</sup> The third level equation is:

$$(3) \quad \eta_k = \gamma + u_k$$

9 We also tried different ways to construct neighborhood-level measures. We performed confirmatory factor analysis (CFA) to construct factor scores for disorder and cohesion at the individual level (these CFA models were estimated with a weighted least squares estimator on the polychoric correlation matrix in Mplus 5.21 to account for the ordinal nature of the data). We used the regression scoring technique to output these factor scores from Mplus. Then, we used (1) a multilevel model mirroring 'ecometrics', but without the extra item-level, to construct neighborhood-level scores; and, (2) a fixed-effects model. The correlations between the different approaches are more than .96 for both cohesion and disorder. Therefore we decided to continue with the accepted 'ecometrics' approach described in the main text.

10 We accounted for possible biasing effects by including several individual- and household-level measures. These include the following; gender, age, age squared, length of residence, household income, education level, home ownership, employment status, Moroccan, Turkish, other race, single parent household, married with no children, married with children, and other marital status.

where  $\eta_k$  represents the overall measure in neighborhood  $k$ , and  $u_k$  is a disturbance for neighborhood  $k$ . The empirical Bayes estimates at the neighborhood level, or posterior means, are then assumed to be the ‘true’ neighborhood-level value.<sup>11</sup>

For *social control* we used two different measures. First, we used the percentage of people who said they “felt co-responsible for the livability and safety of the neighborhood”, which reflects *potential* for neighborhood-level social control. In addition, we used the percentage of people who said that they had “been active to improve the livability and safety of the neighborhood” in the last year, which reflects *actual* social control behavior. Because this question is asked retrospectively, we assume that respondents making a statement about their behavior in the NUP survey of, e.g., 1998, are talking about their actions to improve the neighborhood in the period of 1997-1998.

Lastly, we included the traditional explanatory variables of social disorganization theory. For *residential instability*, we used the percentage of respondents who had been living there for less than two years, constructed from the individual-level data (see also Markowitz, Bellair, Liska, and Liu 2001). *Socioeconomic status* was measured by the mean income per neighborhood.<sup>12</sup> *Ethnic heterogeneity* was measured as the percentage of western migrants (based on socioeconomic and cultural position relative to the native Dutch, these are migrants from Europe, North-America, Oceania, and Indonesia) and non-western migrants living in each neighborhood, here recoded so that an increase of 1 reflects a 10% increase.<sup>13</sup> The socioeconomic status and ethnic heterogeneity measures were provided by Statistics Netherlands, and are measured a year before each of the NUP survey time points: '95-'97-'99-'01-'03-'05.

### 2.3.3 Method of analysis

We accounted for missing data at the individual-level through a multiple imputation (MI) approach. MI requires the less stringent assumption of missing at random than do approaches using listwise deletion, and MI is also more efficient. We included all of the individual-level measures used in the analyses in the imputation procedure. These variables included the various individual-level characteristics that we included as possible biasing effects when constructing our neighborhood-level measures, the various measures that comprised the cohesion and disorder scales, and our measures of shared feelings of responsibility, and actual social control behavior. Given the rate of missingness in our data, we imputed the dataset five times using

11 We also included a separate ‘survey year’ level, because items are nested within respondents nested within years nested within neighborhoods. Then the empirical Bayes estimate at the neighborhood-level plus the estimate at the year-level is the ‘true’ score. We compared this method to a three level (item-individual-neighborhood) model which simply includes an indicator (dummy) variable per survey year. The resultant neighborhood-level measures correlated with  $r > .9$ .

12 Previous studies have also used the median and/or variance of income, or a composite measure reflecting the SES of the neighborhood. However, such measures were not available to us for each time point.

13 We did not use the formula  $1 - \sum p_i^2$ , an index capturing the diversity in the neighborhood, because in such a diversity measure a neighborhood with 80% natives and 20% non-natives will receive the same value as a neighborhood with 20% natives and 80% non-natives. Therefore, we chose to use the original percentage values of the ethnic group.

an MCMC procedure implemented in Stata 9. All analyses were then conducted on these five datasets, and the results were combined and the standard errors were correctly computed (Rubin 1987).

After constructing the neighborhood-level panel datasets, we estimated the models using a full information maximum likelihood estimator in Mplus 5.21.<sup>14</sup> Given that we have no reason to expect that the *size* of the effects will change over the years of the study, we constrain these coefficients to be equal over years. That is, although there are certainly reasons to expect that the level of the various variables will change from year to year, we have no theoretical reason to expect that the relationships we are estimating will change during the relatively short study period. We are estimating the model pictured in figure 2.2 (note: although figure 2.2 ‘looks’ like a cross-sectional path model to facilitate understanding of the entire model, the arrows actually reflect temporal lags). These equations are estimated simultaneously using the maximum likelihood estimator.

We encountered estimation difficulties when attempting to estimate separate equations for each year. Specifically, a problem we encountered was that there were more parameters than observations in the dataset. This, of course, prevents us from estimating such models. Therefore we estimated the models with the data stacked ‘long’, i.e., a neighborhood-period file, a common approach with panel data. One consequence was that we could not estimate separate parameters over the various years, though as we noted above, we feel this is of little consequence given that we have no theoretical reason to expect these coefficients to change over the relatively short time period of this study. Another consequence is that we needed to constrain the error terms to be equal over years. Again, to the extent that the variance on these error terms remains constant over the years of the study, this will not be a problem. We would have preferred to test these assumptions, but the estimation problems we encountered precluded this.<sup>15</sup>

For all equations, we allowed for one or two year lags to appropriately capture the temporality of these processes. These lags occur in part because of (1) the different waves of the survey; (2) the two different sources of data; and (3) the form of the question (whereas some questions to the respondents are retrospective over

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14 As discussed, we used MI to deal with missing individual-level values and then constructed neighborhood-level scores. However, we also used measures reflecting socioeconomic status and ethnic heterogeneity which were directly provided by Statistics Netherlands on the neighborhood-level. These neighborhood-level measures contained a few missing values, and therefore we used the Full Information Maximum Likelihood procedure to estimate the path models.

15 Here, we stacked the data in a typical panel fashion in which each observation represented a neighborhood at a particular time point. The downside of this approach is that we do not explicitly take into account the endogeneity of the  $y$ 's and the possibility that the variances of the residuals might change over time and that there might be correlations among the residuals. In the revised version of this paper, we restructured the data in such a fashion that each row represented a neighborhood, and the various time points are represented as separate variables. This approach has the desirable property of allowing directly estimating these various effects. This approach is described succinctly in Finkel (1995). We are able to explicitly model the endogeneity of the  $y$ 's over time, which accounts for the covariance between the lagged predictor and the error term. We are also able to allow the intercepts to vary over years, and for the disturbance variances to vary over years to account for possible heteroskedasticity. We were also able to test for possible autocorrelation in the error terms. Although this resulted in a few differences compared to the results reported here, the substantive conclusions hold.

the previous year, others ask about current attitudes and opinions). We provide a general sense of these time lags with the schematic shown in figure 2.3. As can be seen, there are one- or two-year lags between all constructs, including the feedback paths. The structural characteristics as well as whether the respondents have taken action to improve the neighborhood were measured in the odd years from 1995 to 2005. Social cohesion, feelings of responsibility and disorder were measured in the even years from 1996 to 2006.

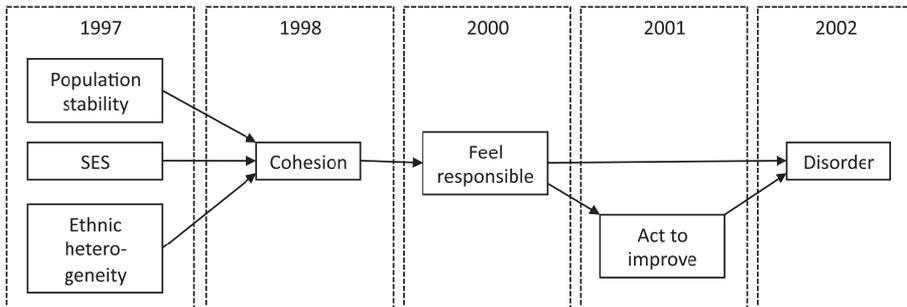


Figure 2.3 Overview of time lags of key variables

According to Waldo Tobler’s first law of geography “everything is related to everything else, but near things are more related than distant things”. Because most statistical techniques are based on the assumption of independence between observations, results may be biased when data have such spatial dependence (Bernasco and Elffers 2010). Applying spatial models is a common way to account for spatial dependence in clustered observations (Anselin 1988). In our models we accounted for global spatial autocorrelation over neighborhoods by including one spatial lag component for each dependent variable. We computed an inverse exponential distance decay weight matrix based on the five closest neighbors.<sup>16</sup> Given our longitudinal modeling framework, these spatially weighted variables were constructed based on the temporally lagged versions of these variables.

## 2.4 Results

### 2.4.1 Descriptive statistics

Table 2.1 shows descriptive statistics of the variables in this study for each time point, averaged across the 74 neighborhoods. Ethnic heterogeneity ranges from 1% to 57% in 1995 and from 3% to 78% in 2005 – thus, there are big differences be-

<sup>16</sup> We also constructed spatially weighted versions of the temporally lagged *independent* variables and re-estimated the models in this paper including those variables. The spatially lagged independent variables showed very few significant effects, and, importantly, the substantive results of the models did not change. Therefore we decided to present the most parsimonious models in the tables, in which we only include spatially lagged version of (the temporally lagged) dependent variables.

Table 2.1 Descriptive statistics, 74 Dutch neighborhoods, 1996-2006

	Min	Max	Mean	S.D.
<b>Disorder</b>				
t1: 1996	-0.31	0.53	0.03	0.18
t2: 1998	-0.29	0.51	0.03	0.17
t3: 2000	-0.36	0.43	0.02	0.16
t4: 2002	-0.35	0.42	0.04	0.16
t5: 2004	-0.32	0.29	-0.02	0.14
t6: 2006	-0.39	0.32	-0.04	0.16
<b>Population turnover (% new residents)</b>				
t1: 1996	3.8	39.5	19.1	7.6
t2: 1998	0.0	38.2	16.8	7.4
t3: 2000	0.0	50.0	19.0	7.7
t4: 2002	2.5	36.8	17.3	7.0
t5: 2004	5.9	36.4	22.6	7.3
t6: 2006	4.8	47.8	24.3	8.8
<b>Socioeconomic status (average income/1000 euro)</b>				
t1: 1995	6.1	14.3	9.0	1.7
t2: 1997	6.1	15.5	9.7	1.9
t3: 1999	6.8	16.0	10.7	1.9
t4: 2001	7.3	18.3	11.8	2.2
t5: 2003	8.5	23.7	13.9	2.8
t6: 2005	7.7	20.8	13.0	2.6
<b>Ethnic heterogeneity (% foreigners)</b>				
t1: 1995	1.0	57.0	13.6	11.7
t2: 1997	1.0	61.0	13.1	12.1
t3: 1999	3.0	71.0	16.7	13.8
t4: 2001	3.0	75.0	17.5	14.4
t5: 2003	3.0	76.0	18.1	14.9
t6: 2005	3.0	78.0	18.8	15.4
<b>Cohesion</b>				
t1: 1996	-0.59	0.46	0.00	0.23
t2: 1998	-0.58	0.38	0.00	0.22
t3: 2000	-0.58	0.39	0.01	0.22
t4: 2002	-0.57	0.35	0.00	0.21
t5: 2004	-0.58	0.49	0.01	0.26
t6: 2006	-0.82	0.38	-0.08	0.29
<b>Potential for social control (% feel responsible)</b>				
t1: 1996	66.7	96.0	84.2	6.0
t2: 1998	70.7	100.0	85.1	6.0
t3: 2000	72.7	100.0	87.4	5.5
t4: 2002	71.3	96.4	87.2	5.9
t5: 2004	80.0	100.0	90.3	4.6
t6: 2006	50.0	96.7	86.0	8.2
<b>Actual social control behavior (% active to improve neighborhood)</b>				
t1: 1995-1996	5.3	50.0	21.5	7.9
t2: 1997-1998	8.1	37.5	21.5	5.7
t3: 1999-2000	13.0	57.1	26.2	8.6
t4: 2001-2002	13.6	73.7	30.6	8.7
t5: 2003-2004	12.6	39.0	26.2	5.8
t6: 2005-2006	14.3	56.0	32.7	7.9

Note: population turnover, ethnic heterogeneity, potential for social control (i.e., % feeling responsible), and actual social control behavior (i.e., % active to improve the neighborhood) were divided by 10 in the models for estimation purposes. Source: NUP, first imputation.

tween neighborhoods with respect to the percentage of residents of foreign descent. On average neighborhoods have about 14% foreign residents in 1995 and 19% in 2005. The mean average income increases slightly over the years, and it ranges from about 9,000 Euros to 13,000 Euros per neighborhood resident, also indicating large variation between neighborhoods. Our measure of residential mobility, the percentage of respondents who have lived less than two years in each neighborhood, ranges from 0% to 50%. Because we used 'ecometrics' analysis (Raudenbush and Sampson 1999) to construct our measure of disorder, this measure has by definition a mean of 0 across all neighborhoods across all years. During the course of time, disorder in the worst neighborhood seems to decrease somewhat, from 0.53 in 1996 to 0.32 in 2006.

The mediating variables, the percent of respondents who feel responsible for the livability and safety of the neighborhood, the percent of respondents who have taken actions to make the neighborhood more livable and safe, and the constructed measure of social cohesion also vary both between neighborhoods and between waves of data. The percentage of respondents feeling responsible for the livability and safety of the neighborhood seems relatively stable over time, with 84% in 1996 and 86% in 2006. However, between neighborhoods within each year, there is quite some variation: for example, in one neighborhood in 1996 67% of the respondents felt responsible compared to 96% of the respondents in another neighborhood. Similarly, across all waves the mean percentage of respondents who have taken actions on behalf of the neighborhood range from about 22% to 33%, while the range of this measure varies considerably across waves.

In table 2.2 we present the change over time formally by estimating the correlation coefficients between the measurements of each variable at each of the six time points. Table 2.2 shows that residential mobility and the two measures of social control vary between the three different time points. Although there is ample between-neighborhood variation of ethnic heterogeneity, socioeconomic status, and social cohesion, table 2.2 illustrates that the neighborhoods themselves are very stable over time on these latter characteristics.

Our measure of disorder both has a similar mean and range across neighborhoods across data waves (see table 2.1), and remains stable over time for each neighborhood (see table 2.2).<sup>17</sup> These results confirm Shaw and McKay's (1969) original thesis that neighborhoods remain relatively stable over time, which was the basis of their search for neighborhood explanations of crime and disorder. This will also have consequences for our models below, as this stability over time combined with our modeling approach of including lagged versions of the measures reduces our statistical power.

17 The stability of disorder could partly be the result of using perceptions of disorder measured on a five-point scale instead of observations of disorder. In addition, the stability of our measure is also partly the result of the more precise 'ecometrics' method with which the variable was constructed: neighborhood-year combinations are assumed to be a sample of the true population and the measures of disorder are shrunk towards to mean based on the number of respondents within each neighborhood. Studies which have not employed the ecometrics strategy to create neighborhood-level variables from individuals' perceptions may have underestimated the stability of neighborhood characteristics over time due to failing to account for measurement error.

Table 2.2 Correlations over time for all variables, 74 neighborhoods, 1996-2006

	t1	t2	t3	t4	t5	t1	t2	t3	t4	t5	t1	t2	t3	t4	t5
Disorder															
t2	.957**														
t3	.935**	.943**													
t4	.931**	.940**	.957**												
t5	.899**	.922**	.917**	.917**											
t6	.830**	.859**	.865**	.869**	.938**										
Population turnover															
t2	.534**														
t3	.339**	.458**				.966**					.987**				
t4	.225	.281*	.556**			.934**	.969**				.966**	.987**			
t5	.534**	.549**	.633**	.463**		.912**	.924**	.962**			.932**	.963**	.988**		
t6	.428**	.420**	.621**	.516**	.715**	.893**	.916**	.955**	.975**		.901**	.939**	.970**	.984**	
						.893**	.920**	.940**	.939**	.957**	.870**	.917**	.954**	.968**	.991**
Socioeconomic status															
Ethnic heterogeneity															
Cohesion															
Potential for social control (% feel responsible)															
t2	.960**														
t3	.934**	.947**				.532**	.365**				.239*				
t4	.932**	.948**	.962**			.479**	.382**	.520**			.174	.368**			
t5	.921**	.930**	.962**	.956**		.241*	.481**	.443**	.501**		.251*	.357**	.244*		
t6	.876**	.895**	.936**	.926**	.960**	.466**	.393**	.633**	.388**	.529**	.293*	.513**	.335**	.350**	
						.488**	.481**	.633**	.388**	.529**	.212	.186	.316**	.161	.426**
Actual social control behavior (% active to improve)															

\*\* p<0.01; \* p<0.05 (two-tailed tests). Source: NUP, first imputation.

## 2.4.2 Cross-sectional analyses

We begin by estimating a recursive model in which we treat our data as cross-sectional. Thus, we pooled the data together and estimate a model as if all variables had been measured at the same point in time. With this approach we mimic previous studies, so that we can assess whether the general pattern observed in this setting in the Netherlands matches that discovered in prior research conducted in U.S. cities.<sup>18</sup>

Table 2.3 Full Information ML parameter estimates of cross-sectional analyses of the traditional social disorganization model, 74 neighborhoods, 1996-2006

	Cohesion		Potential for social control (% feel responsible)		Disorder	
	B	S.E.	B	S.E.	B	S.E.
Intercept	0.154	0.146	7.817	0.438**	0.249	0.188
Population turnover	-0.027	0.015+	-0.010	0.055	0.051	0.014**
Socioeconomic status	0.005	0.009	0.064	0.021**	-0.008	0.008
Ethnic heterogeneity	-0.126	0.015**	0.010	0.039	-0.001	0.015
Cohesion			1.212	0.176**	-0.205	0.074**
Potential for social control					-0.037	0.019*
yr1998	0.005	0.042	0.068	0.167	0.094	0.037*
yr2000	0.062	0.028*	0.225	0.119+	0.087	0.028**
yr2002	0.045	0.024+	0.155	0.123	0.120	0.024**
yr2004	0.068	0.013**	0.318	0.088**	0.066	0.015**

Model fit:  $\chi^2=68.8$  ( $df=3$ ),  $CFI=0.913$ ,  $RMSEA=0.244$ .

\*\*  $p < 0.01$ ; \*  $p < 0.05$ ; +  $p < 0.1$  (two-tailed tests). Source: NUP.

As shown in table 2.3, we find that neighborhoods with a higher percentage of foreign residents ( $B = -.126$ ,  $p < .001$ ) and more population turnover ( $B = -.027$ ,  $p < .1$ ) have less social cohesion, this cohesion is associated with higher levels of feeling responsible for the neighborhood ( $B = 1.212$ ,  $p < .001$ ), and both social cohesion ( $B = -.205$ ,  $p < .01$ ) and feelings of responsibility ( $B = -.037$ ,  $p < .05$ ) appear to translate into lower levels of disorder. Thus, both of these structural measures appear to be mediated by cohesion and informal social control, as hypothesized. Furthermore, neighborhoods with higher income ( $B = .064$ ,  $p < .001$ ) have a higher percentage of people feeling responsible for the neighborhood, which then appears to result in lower levels of disorder, also consistent with the hypothesized mediating effect.

18 In principle, we could have used the data from all of the years: 1996-2006. However, in our longitudinal analyses we do not include disorder as an outcome variable in 1996 because we cannot control for the previous level of disorder, in 1994. Therefore, to maintain comparability, the cross-sectional analyses were performed with the exact same time points as our longitudinal analyses: 1998-2006. In addition, 2006 was used as the reference category of time point, so that we report the parameter estimates of years 1998, 2000, 2002, and 2004.

Moreover, neighborhoods with more population turnover ( $B=.051, p < .001$ ) appear to have a direct effect on experiencing more disorder.

Thus, our cross-sectional analyses replicate previous findings: certain structural neighborhood characteristics go hand in hand with less cohesion and less social control, and both of these mediate the relationship with disorder. We next turn to our longitudinal models that allow for temporal differentiation in these effects.

### 2.4.3 Explanatory analyses

#### Population turnover, income, and ethnic heterogeneity

To test hypothesis 1, we estimated a separate model which only takes into account that the neighborhood structural characteristics precede disorder one year or two years in time (depending on the availability of the measurements), but in which we do not estimate the mediating effects of social cohesion or social control. We control for previous levels of all variables, including disorder, and we also control for spatial autocorrelation of all variables. Thus we can test, given the previous level of disorder, the additional effect of the three structural characteristics. Table 2.4 presents the results of this model.

Table 2.4 Full Information ML parameter estimates of structural neighborhoods characteristics on disorder, 74 neighborhoods, 1996-2006

	Disorder	
	B	S.E.
Intercept	-0.008	0.025
Socioeconomic status	-0.002	0.001
Ethnic heterogeneity	0.011	0.002**
Population turnover	0.001	0.005
Disorder (t-2)	0.883	0.025**
Spatial coefficient	0.116	0.031**
yr1998	0.036	0.011**
yr2000	0.005	0.010
yr2002	0.047	0.009**
yr2004	-0.026	0.012*

Model fit:  $Chi-2=88.6$  ( $df=27$ ),  $CFI=0.985$ ,  $RMSEA=0.078$ .

\*\*  $p < 0.01$ ; \*  $p < 0.05$ ; +  $p < 0.1$  (2-tailed). Spatial coefficient refers to the parameter estimate of a spatially and temporally lagged version of disorder. Source: NUP.

Table 2.4 shows that the strongest predictor of disorder is the level of disorder at the previous time point, as expected given the correlations over time ( $B=.883, p < .01$ ). Furthermore, the level of disorder in surrounding neighborhoods at the previous time point have a further positive effect on disorder in the focal neighborhood ( $B=.116, p < .01$ ). Thus, we see evidence of a clustering effect in which larger areas of

multiple neighborhoods experience a worsening effect of disorder over time based on a diffusion effect from nearby neighborhoods. Population instability as measured by the percentage of new residents in the neighborhood ( $B=.001, p=.86$ ) as well as neighborhood income ( $B=-.002, p=.20$ ) do not significantly affect subsequent disorder.<sup>19</sup> Higher ethnic heterogeneity leads to more subsequent disorder ( $B=.011, p<.01$ ), thus finding support for Hypothesis 1 only for this variable.<sup>20</sup>

We next turn to the full extended social disorganization model by adding mediation effects and feedback effects. Note that, in addition to the hypothesized effects in figure 2.2, we also estimated the direct effects of population stability, SES, ethnic heterogeneity, and cohesion on disorder. Thus we can test whether these variables retain a significant direct effect on disorder after controlling for the mediating variables.

The model fits well with a Comparative Fix Index (*CFI*) of .967 and a Root Mean Square Error of Approximation (*RMSEA*) of .078 ( $\chi^2 = 252.6$  with  $df=78$ ). Although relationships are simultaneously estimated using full information maximum likelihood estimation in Mplus version 5.21, we discuss them in three separate sections. Table 2.5 presents the parameter estimates of the model.<sup>21</sup>

#### Cohesion and social control

The first two columns of table 2.5 show that neighborhood income and population turnover have no significant effects on subsequent social cohesion, and thus we do not see support for *Hypotheses 2a* and *2b*. However, a higher percentage of migrants living in the neighborhood leads to less cohesion one year later ( $B= -.021, p < .01$ ), which supports *Hypothesis 2c*. Due to the stability of social cohesion over time, the previous level of social cohesion is the strongest predictor of current cohesion ( $B=.884, p < .01$ ). The level of cohesion clusters positively in space: neighborhoods with high cohesion tend to cluster together, as do neighborhoods with low cohesion. A higher level of cohesion in surrounding neighborhoods leads to more cohesion in the focal neighborhood at a later time point ( $B=.133, p<.01$ ).

Columns 3 and 4 of table 2.5 show that cohesion is a strong predictor of the percentage of people feeling responsible for the livability and safety of the neighborhood ( $B=.677, p < .01$ ), thus finding support for *Hypothesis 3* for *potential* for social control. The effect of ethnic heterogeneity on *potential* for social control is mediated by cohesion. Although the effect of neighborhood socioeconomic status on the percentage of respondents that feel responsible for the livability and safety of the neighborhood is not mediated by cohesion, it does have a direct effect after controlling for cohesion ( $B=.045, p < .1$ ). The previous level of feelings of responsi-

19 We get similar results for a model that does not control for spatial autocorrelation, although the effect of neighborhood income on disorder in that model is more significant ( $B=-.002, p < .1$ ). All other parameter estimates are comparable.

20 Note that while we do not show these controls in the table, the previous levels of the explanatory variables also strongly predict subsequent levels of these variables. This holds for all variables: population turnover ( $B=.462, p<.001$ ), income ( $B=1.008, p<.001$ ), and ethnic heterogeneity ( $B=1.034, p<.001$ ). In addition, we find evidence for spatial clustering effects over time for neighborhood income ( $B=.085, p<.01$ ) and population turnover ( $B=.408, p<.01$ ).

21 We also tested various interaction effects in an exploratory fashion, but these were not significant.

Table 2.5 Full Information ML parameter estimates of extended social disorganization model, 74 neighborhoods, 1996-2006

	Cohesion		Potential for social control (% feel responsible)		Actual social control behavior (% taken actions)		Disorder		Population turnover	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Intercept	-0.008	0.032	5.613	1.130**	2.009	0.615**	-0.021	0.028	0.533	0.298+
Population turnover	-0.001	0.005	0.008	0.049	-0.198	0.072**	0.002	0.005		
Socioeconomic status	-0.003	0.002	0.045	0.017+	0.059	0.029*	-0.002	0.002		
Ethnic heterogeneity	-0.021	0.005**	-0.029	0.036	0.139	0.058*	0.007	0.003*		
<i>Lagged variables</i>										
Cohesion	0.884	0.032**	0.677	0.238**	0.870	0.292**	-0.029	0.016+		
Potential for social control			0.133	0.074+	0.094	0.095	-0.006	0.005		
Actual social control behavior					0.211	0.057**	0.007	0.004+		
Disorder	0.009	0.021	-0.383	0.165*	0.886	0.295**	0.813	0.025**	0.622	0.268**
Population turnover									0.428	0.078**
Spatial coefficient	0.133	0.031**	0.258	0.122*	0.020	0.098	0.120	0.029**	0.347	0.131**
yr1998	0.060	0.014**	0.351	0.193+	-0.754	0.225**	0.038	0.012**	-0.343	0.188*
yr2000	0.083	0.013**	0.515	0.136**	-0.386	0.187*	0.006	0.010	-0.022	0.149
yr2002	0.059	0.013**	0.353	0.131**	-0.177	0.172	0.047	0.009**	-0.243	0.230
yr2004	0.095	0.014**	0.587	0.110**	-0.724	0.147**	-0.023	0.012+	0.418	0.190*

Model fit:  $\chi^2=252.6$  ( $df=78$ ),  $CFI=0.967$ ,  $RMSEA=0.078$ .

\*\*  $p<0.01$ ; \*  $p<0.05$ ; +  $p<0.1$  (2-tailed). Source: NUP.

Spatial coefficient refers to the parameter estimate of a spatially and temporally lagged version of each dependent variable.

bility also affects subsequent levels of responsibility after controlling for the other variables ( $B=.133, p < .1$ ). Notably, we also find evidence that greater potential for social control in surrounding neighborhoods leads to a greater potential for social control in the focal neighborhood ( $B=.258, p<.05$ ).

Finally, columns 5 and 6 of table 2.5 present support for a direct positive effect of social cohesion on the *actual* social control behavior, measured as the percentage of people taking actions to improve the neighborhood ( $B=.870, p < .01$ ), similar to the effect of cohesion on the *potential* for social control. Thus we again find support for *Hypothesis 3*. Interestingly, we do not find a significant effect of *potential* social control on *actual* social control behavior ( $B=.094, p=.32$ ). So, the percentage of people feeling responsible for the neighborhood has no relationship with the percentage of people actually taking action to improve the neighborhood, and thus we do not find support for *Hypothesis 4*. In addition, the percentage of people in surrounding neighborhoods which takes action to improve their neighborhoods is not significantly related to the percentage of people taking action in the focal neighborhood ( $B=.020, p=.84$ ).

It is important to emphasize that we find direct positive effects of all structural neighborhood characteristics on the subsequent percentage of people who take action to improve the neighborhood. Higher levels of population turnover reduce this direct social control behavior ( $B= -.198, p < .01$ ), whereas higher levels of income ( $B=.059, p < .05$ ) and ethnic heterogeneity ( $B=.139, p < .05$ ) increase the provision of such social control, when taking into account the other measures in the model. Shared *feelings* of responsibility do not seem to be a necessary precondition for actions on behalf of the neighborhood. This highlights the need to decompose social control into its *potential* and the *actual* social control behavior.

#### Causes of disorder

Columns 7 and 8 present the part of the model explaining neighborhood differences in disorder. As expected, previous levels of disorder strongly predict subsequent levels of disorder in each of these models, net of the other explanatory variables ( $B=.813, p < .01$ ). Moreover, we find that controlling for all other variables, higher levels of disorder in surrounding neighborhoods lead to more disorder in the focal neighborhood ( $B=.120, p<.01$ ). Thus, not only disorder of the same neighborhood, but also disorder of the surrounding neighborhoods leads to more disorder.

In addition, higher percentage ethnic heterogeneity results in lower levels of disorder ( $B=.007, p < .05$ ). Higher levels of cohesion result in lower levels of disorder, although this effect is only weakly significant ( $B= -.029, p < .1$ ). Surprisingly, the percentage of people taking action to improve the neighborhood actually shows a modestly positive effect on subsequent disorder ( $B=.007, p < .1$ ), which contradicts our hypotheses.<sup>22</sup>

22 As we discuss in the 'feedback effects of disorder' section below, disorder leads to a higher subsequent percentage of people trying to improve the neighborhood. We interpret the negative effect of '% active to improve' on disorder as follows: residents are actually trying to improve the neighborhood, but on average their efforts are not enough to turn the neighborhood disorder around.

### Feedback effects of disorder

We hypothesized that disorder would affect subsequent levels of cohesion, social control, and population turnover. As table 2.5 shows, we did not find empirical support for *Hypothesis 6a*, that disorder affects the level of social cohesion ( $B=.009$ ,  $p=.66$ ). However, all other hypotheses of feedback effects of disorder are supported. First, we find that with a high level of disorder, subsequently a lower percentage of people feel responsible for the livability and safety of the neighborhood ( $B=-.383$ ,  $p < .05$ ), thus supporting *Hypothesis 6b*. Second, we find support for *Hypothesis 6c*, as disorder leads to more subsequent *actual* social control behavior, measured as the percentage of people taking action to improve the livability and safety of the neighborhood ( $B=.886$ ,  $p < .01$ ). Third, more disorder leads to a higher population turnover, supporting *Hypothesis 6d* ( $B=.622$ ,  $p < .01$ ).<sup>23</sup>

### 2.4.4 Sensitivity analyses

What might explain the somewhat surprising finding of a positive relationship between social control behavior and neighborhood disorder? It may be that our two-year lag is simply too long to appropriately capture this relationship. To assess this, we estimated an ancillary model in which we replaced the lagged variables of social cohesion and feelings of responsibility by these variables measured *in the same year* to the equation predicting disorder.<sup>24</sup> We see no evidence that a higher percentage of respondents feeling responsible for the neighborhood ( $B= -.006$ ,  $p=.41$ ) will reduce disorder at the same time point. With a different lag period we still get similar results for *Hypothesis 5*. We find a stronger significant effect for social cohesion: higher levels of social cohesion ( $B= -.072$ ,  $p < .01$ ) are related to lower levels of disorder at the same time point. However, because social cohesion and disorder are now measured at the same time point, we can no longer disentangle cause and effect. Lastly, we note that ethnic heterogeneity no longer affects the level of disorder at the next time point ( $B=.001$ ,  $p=.67$ ). Not specifying the lag period during which these processes should occur, would lead us to conclude that the neighborhood characteristics are fully mediated by social cohesion and social control, whereas the time-lagged model in table 2.5 suggests that ethnic heterogeneity does have a direct effect.

In addition, we investigated whether the results of the longitudinal analyses were greatly influenced by including the *actual* social control behavior in our model. That is, the final model (table 2.5) not only differs from the initial cross-sectional models (table 2.3) in being longitudinal and taking account of spatial autocorrelation, but it also includes the percentage of respondents reporting they had been active to improve the livability and safety of the neighborhood. Might this somehow have caused the non-significant effect of *potential* for social control on disorder? To assess this, we estimated a model which did not include the *actual* social control

23 We also tested whether the disorder of surrounding neighborhoods (i.e., a spatially weighted version of the temporally lagged disorder) affected these neighborhood characteristics at a later time point. We did not find any evidence for such effects.

24 Due to multicollinearity, it was not possible to include both the lagged versions of social cohesion and social control and the non-lagged versions of these variables in the same model.

behavior variable, but which otherwise was the same as the model in table 2.5. We still did not find evidence that the *potential* for social control directly affects disorder ( $B = -.005, p = .37$ ). The only substantive difference between this model and our results in table 2.5 concerns the effect of social cohesion on disorder, which is now no longer significant ( $B = -.022, p = .17$ ). Thus, we do not find any evidence that the *potential* for social control directly affects disorder when we use proper longitudinal data and take spatial autocorrelation into account.

## 2.5 Conclusion

This study used a longitudinal neighborhood-level dataset to test the central hypotheses of social disorganization theory (Shaw and McKay 1969), namely that low socioeconomic status, high ethnic heterogeneity, and high population turnover lead to more neighborhood disorder. We also tested mediation effects of cohesion and social control as proposed by more recent revitalizations of this classic theory (inter alia Bursik and Grasmick 1993; Markowitz, Bellair, Liska, and Liu 2001; Sampson and Groves 1989; Sampson, Raudenbush, and Earls 1997). In addition, we simultaneously tested for feedback effects of disorder back to the structural neighborhood characteristics, cohesion, and social control at a later point in time (Robinson, Lawton, Taylor, and Perkins 2003; Skogan 1990). We next describe the main findings.

The first important theme of our findings was disentangling social control into the *potential* for social control and *actual* social control behavior. Prior scholarship generally does not make such a distinction. Controlling for all other effects, the *potential* for social control (i.e., shared feelings of responsibility) has no impact on subsequent disorder. This lack of effect also seems reasonable as potential offenders use visual cues to assess the neighborhood (St. Jean 2007), which are partly provided by the level of disorder. That residents *share feelings* of responsibility ultimately does not affect subsequent disorder – *actions* affect a neighborhood's disorder, and more importantly, disorder itself leads to a population turnover and a breakdown of social control.

A second important theme was the striking difference in the results using neighborhood-level longitudinal data and controlling for previous levels of every variable in the models compared to cross-sectional models. In particular, we found no evidence that the percentage of respondents who feel responsible for the safety and livability of the neighborhood affects levels of disorder. This measure of *potential* for social control is quite similar to the measures used in previous studies, yet we did not replicate previous findings when estimating longitudinal models. It is important to highlight that our findings estimating cross-sectional models mimicked those of neighborhoods in other countries, suggesting that our differences are not due to the setting, but rather due to more appropriately allowing for a temporal lag. Thus we argue that our data are indeed comparable to previous studies. Proper neighborhood-level longitudinal data allows for controlling for previous levels of all variables, as well as allowing for time lags to take account of causality. As a result, we conclude that the interpretation of results by previous studies may partly have

resulted from inappropriate assumptions about the directions of these relationships.

A third theme of this study was viewing the mediating effects of cohesion and informal social control (both the *potential*, and the *actual* behavior) between neighborhood structural characteristics and disorder. Controlling for previous levels of all explanatory and dependent variables, we found that only ethnic heterogeneity leads to lower levels of subsequent social cohesion. Higher average income of the neighborhood as well as a higher level of social cohesion increases the *potential* for social control.

The neighborhood structural characteristics consistently affected the *actual* social control behavior, measured as the percentage of respondents who said they had taken action to improve the livability or safety of the neighborhood. Higher income levels and a more stable population led to more action. In contrast to predictions of social disorganization theory, higher ethnic heterogeneity also resulted in more action. This may be due to more non-natives living in areas where there is something to 'improve' in the first place. In addition to these neighborhood structural characteristics, higher levels of cohesion lead to more people taking action to improve the neighborhood. However, we did not find that the *potential* for social control is related (either with a two-year time lag or without a time lag) to more *actual* social control. As such, the *potential* for social control is not a necessary or sufficient precondition for taking action to *actually* improve a neighborhood.

A fourth theme was the important role that disorder plays in generating neighborhood change. Because of the neighborhood-level panel dataset used in this study, we had the opportunity to also test feedback effects of disorder. We tested the effects of disorder on all of the explanatory variables at subsequent points in time: when controlling for lagged versions of each variable, we find support for the hypotheses that neighborhood disorder leads to less *potential* social control, more *actual* social control, and more population turnover. This suggests that disorder could be directly detrimental to informal social control (both directly and indirectly through population turnover), but not for the formation and maintenance of social cohesion.

In summary, the results suggest a cyclical model in which neighborhoods have relatively stable levels of disorder over time, and the processes which lead to disorderly neighborhoods are difficult to turn around. Neighborhoods with high levels of disorder cause more people to move out, and higher population turnover leads to a lower percentage of people taking action to improve the livability and safety of the neighborhood. Neighborhood disorder thus has cumulative effects over and above the direct effect on population turnover by reinforcing itself via a weakening of community processes of social control. Our simple descriptive statistics about the stability of neighborhood disorder through time underscore this conclusion.

## 2.6 Discussion

Of course this study also has several limitations, and we can suggest several possibilities for further research. First, we did not simultaneously investigate the effect of

social cohesion and social control on crime as well as on disorder. Research suggests that crime and disorder are both caused by the same community-level processes (Sampson and Raudenbush 1999). The visual cues of disorder may lead to more crime in some neighborhoods and not in other neighborhoods, thus affecting population turnover, social cohesion and social control even more via crime. Second, our measure of disorder was provided by the neighborhood residents themselves, which undoubtedly introduces measurement error because of individual differences. Even though we employed the 'ecometrics' method (Sampson and Raudenbush 1999) to control for some such individual differences, disorder may be even more objectively measured by systematic social observation. Third, our study focused on the city of Utrecht, one of the four largest cities of the Netherlands. Even though we feel this is a strength of our study, since we test social disorganization theory and feedback loops of disorder in a different context than the United States, the results are therefore less comparable to previous studies. Disorder, for one thing, is present less frequently in the Netherlands than in the average large U.S. city. We cannot say how much of the differences between our study and previous studies are caused by cultural or other unobserved differences. Fourth and finally, we stress that the interplay of different *actors* and their *actions* in the neighborhood is important to explain disorder. Even though social disorganization is a neighborhood-level theory, a focus on an individual level theory of action with regard to social control may be the most fruitful area of further research. Do people who *feel* responsible for the neighborhood actually *act* to improve it? From our own individual level data, only about 30 percent of these 'responsible' people have actually taken action to improve the neighborhood. Even in neighborhoods with a lot of disorder ( $> +2$  s.d. disorder) more than two thirds of the respondents who state that they feel responsible for the neighborhood do *not* take action to improve it. Individual level analyses are needed to shed light on our neighborhood level outcomes.

Although this study has highlighted the importance of approaching these questions using longitudinal data, an implication is the importance of considering the proper temporal lag when viewing these processes. There is little theoretical guidance regarding this issue, and even less empirical evidence given the limited number of studies with longitudinal data allowing addressing this question. Although the call for longitudinal data is important, it is also necessary to consider the proper time period in which these processes occur such that data are collected at useful intervals. Intervals that are too long will essentially reduce the modeling to that of cross-sectional data, necessitating the modeling of simultaneous relations. Intervals that are too short will not be able to capture how the neighborhood changes in response to the particular stimulus. This is an important issue, and will necessarily be a key area for future research.

In conclusion, this study has made two main contributions to previous research: disentangling social control into the *potential* for social control and *actual* social control behavior, and taking into account the important role disorder plays in neighborhood dynamics. First, that residents *share feelings* of responsibility ultimately does not affect subsequent disorder: *actions* are necessary to improve the neighborhood. Although it is difficult to observe social control—it only occurs *in response* to problems—it nonetheless is important to not simply assume that intentions to

provide social control will in fact be translated into action during times of difficulty. Second, our results using longitudinal data showed that disorder frequently appears to play a stronger role in how neighborhood composition and social control change over time than how these characteristics affect neighborhood disorder. The fact that we obtained results that mimicked the existing literature when treating our data in a cross-sectional manner provides a particularly strong challenge to the existing large body of prior research studying these processes with cross-sectional data. Thus, we highlight the need for much more concerted effort to study neighborhood processes with longitudinal data.

# Chapter 3

## LOCAL BUSINESSES AS ATTRACTORS OR PREVENTERS OF NEIGHBORHOOD DISORDER



This chapter was co-authored by Beate Völker, Henk Flap, and Frank van Oort. A slightly different version of this chapter is forthcoming in *Journal of Research in Crime and Delinquency*.

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# Local businesses as attractors or preventers of neighborhood disorder

## 3.1 Introduction

This paper investigates the relationship between non-residential land use, e.g., the presence of firms, shops or small businesses in urban neighborhoods, and perceived social and physical disorder (Kelling and Coles 1996; McCord, Ratcliffe, Garcia, and Taylor 2007; Sampson and Raudenbush 1999; 2004; Skogan 1990; Taylor 1999; Wilcox, Quisenberry, Cabrera, and Jones 2004; Wilson and Kelling 1982). Usually, social disorder refers to problems such as fighting neighbors, loud noise or arguing, while examples of physical disorder are vandalism, graffiti, and litter on the streets. As such, social and physical disorder are 'minor' forms of deviant behavior, some of which are prohibited by law (e.g., vandalism), while others are not (e.g., loitering), although this differs between places and time periods. The seriousness of a disorderly deviant act is usually deemed low (e.g., Rossi, Waite, Bose, and Berk 1974). Nevertheless, social and physical disorder is a pervasive problem in many urban areas, as it is quite common in urban neighborhoods to be confronted with, e.g., garbage in front of one's door. In addition, physical disorder can be observed after the fact, while many more serious delinquent acts (e.g., larceny) can only be perceived when the act itself is taking place.

There is a large body of literature devoted to explaining disorder, but relatively few studies focus on the effects of (different types of) businesses on neighborhood disorder. Taylor, Koons, Kurtz, Greene and Perkins (1995) concluded that street blocks with more non-residential land use experience more incivilities. LaGrange (1999) found that the presence of malls was positively related to property damage (i.e., physical disorder). The presence of catholic high schools was positively related to park vandalism, but not vandalism of other buildings or bus stops, whereas the presence of public high schools was related to all three types of property damage. A study by Wilcox et al. (2004) suggested that places of business are related to more disorder, but the presence of schools are not related to disorder. Sampson and Raudenbush (2004) did not find a relationship between the proportion of block groups with mixed land use and perceived incivilities in Chicago. However, using a more specific measure of mixed land use, they show that the presence of bars and liquor stores, alcohol/tobacco advertisements and commercial building security was related to more disorder. McCord et al. (2007), however, criticized the statistical analysis and measurement of non-residential land use in that study. Their analyses show that residents with more crime-generating or crime-attracting

land uses nearby reported their neighborhood as more disorderly. Interestingly, of the traditional explanatory neighborhood conditions, such as residential stability, ethnic heterogeneity, and socioeconomic status of the neighborhood, only the socioeconomic status of the neighborhood was significantly related to less perceived incivility after controlling for mixed land use. Based on ethnographic research, St. Jean (2007) argues that specific places, i.e., businesses, in the urban environment provide opportunity for deviant behavior, and that these places are a more important explanation for crime and disorder than traditional explanations which focus on social cohesion and social control.

Given the growing literature on non-residential land use and its association with disorder, it is surprising that the role of employees of neighborhood businesses has not been studied so far. Among the very few exceptions are Clarke (1992) and Felson (Felson 1986; 2002), who mention the potentially important role of business employees in the explanation of disorder. Employees of neighborhood businesses might be even more important to a neighborhood's order than the residents themselves: in a neighborhood with businesses and a high employment rate of residents, there may be more business employees present than residents during working hours, provided the employees are themselves not residents of that neighborhood. As such, these employees may be better able to prevent disorder than the residents during the day. Of course, the businesses where these employees work may attract more potential offenders who would not have come to the neighborhood had there not been a business to visit in the first place. Therefore, when explaining disorder, the ratio between the number of neighborhood businesses and the number of employees in these businesses should be investigated, while controlling for traditional explanations.

In this paper, we will explore the role of business employees to extend the discussion on the importance of non-residential activities in explaining neighborhood disorder. Following McCord et al. (2007) and St. Jean (2007), we investigate arguments from two prominent theoretical perspectives, routine activity theory and social disorganization theory. We use detailed information from 278 neighborhoods in the four largest cities of the Netherlands.

## 3.2 Theory

In this section, we discuss two prominent theories for the explanation of disorder in neighborhoods, routine activity theory and social disorganization theory, and we show that these provide complementary arguments. In addition, they provide explicit arguments on the effects of business presence and the number of employees on a neighborhood's social and physical disorder.

### 3.2.1 Routine activity theory

Routine activity theory states that for any deviant act to occur, *motivated offenders* must have contact with *suitable targets* in the absence of *capable guardians* (Clarke and Felson 1993). Most deviance occurs during the *routine activities* that people

conduct in their daily lives, such as living, working, and shopping. Thus, offenders and targets converge in space and time because of their daily activities: we call places that are most conducive to such convergence *suitable places*. Routine activity theory usually assumes that motivated offenders are present, and predominantly tries to explain the suitability of the target (i.e., the relative vulnerabilities of targets as perceived by potential offenders) or the presence of capable guardians. The intriguing implication of this theory is that even if every neighborhood harbors a similar number of motivated offenders, differences in deviance may occur because of different distributions of suitable targets or capable controllers.

Eck and Weisburd (1995) introduced the term ‘controller’, a more general concept than ‘guardian’. Controllers may be either people related to the potential victim (e.g., parents and close friends), guardians (e.g., other residents, but also formal institutions such as the police) or place managers (e.g., store clerks). In the remainder of this paper, we will refer to ‘controller’ even if the original text used the term ‘guardian’ because this term also includes ‘place managers’, which are exactly the type of controllers we investigate in this paper.

To apply routine activity theory to neighborhood physical and social *disorder*, we need to provide arguments regarding the presence of offenders and controllers, the ratio of which serves as a measure of the suitability of a place. In contrast, to explain *personal victimization*, we would also need to account for an individual’s movement through space during the course of a day (i.e., their routine activities). In our research, however, the neighborhood itself is the ‘target’, so we do not have to account for the target moving through space.<sup>27</sup>

### 3.2.2 Social disorganization theory

Social disorganization theory is another prominent perspective guiding neighborhood studies on disorder (Hipp 2007; Pratt and Cullen 2005). Shaw and McKay (1969) argued that specific social structures of a neighborhood diminish its ability to remain socially organized, thus leading to higher levels of disorder. Recent research replicated these findings and further developed the original theory (Markowitz, Bellair, Liska, and Liu 2001; Sampson and Groves 1989; Smith, Frazier, and Davison 2000).

First, residential mobility and ethnic heterogeneity undermine the social control that residents exercise over each other and over strangers (Bursik 1988). While residential mobility impedes the formation of stable relationships necessary for social control, ethnic heterogeneity impedes communication between groups in the neighborhood (Bursik 1988; Bursik and Grasmick 1993). Second, it is argued that in such neighborhoods the cultural transmission of delinquent values takes place more easily (Pratt and Cullen 2005; Shaw and McKay 1969). The (lack of) social

27 Some neighborhoods may be more suitable targets than other neighborhoods because they provide more opportunities for deviancy, e.g., by the presence of anonymous high-rise buildings with many escape routes. Research with regard to ‘crime prevention through environmental design’ (CPTED) and ‘situational crime prevention’ provides such arguments on the suitability of a target. In this research we were only able to incorporate the amount of ‘open/recreational space’ in the neighborhood, at the suggestion of an anonymous reviewer.

control and the ease of passing on of criminal traditions differ in each neighborhood, and thus neighborhoods differ in their rates of delinquency.<sup>28</sup>

Thus, while social disorganization theory is a neighborhood-level theory, the recent adjustments to the theory assume that the neighborhood-level outcomes are caused through the interrelated actions of individual actors. Social disorganization and routine activity theory distinguish the same relevant actors (Hipp 2007): capable controllers and potential offenders. However, in social disorganization theory, actors, if specifically mentioned at all, are assumed to be merely the neighborhood residents themselves. In reality, there are also other actors present in a neighborhood. The intervening actions of employees may be as important as, or even more important than, the actions of residents to explain neighborhood differences in social and physical disorder.

In this study, we control for the resident-based explanations of social disorganization theory to gauge the net effect of the neighborhood businesses and the number of people who work in these businesses. In line with assumptions of social disorganization theory, we expect to find more physical and social disorder in neighborhoods with more residential mobility, a higher percentage of non-western migrants, lower income, and higher population density.<sup>29</sup>

### 3.2.3 Do businesses provide 'suitable places' for neighborhood disorder?

#### Businesses attract offenders and controllers

Neighborhoods with many businesses are suitable places for disorder to occur because these businesses attract people in the course of their daily routine activities, i.e., shopping, working or spending leisure time. These are not only people who live in the neighborhood, but often are people that come to these businesses from outside the neighborhood. Businesses attract a mixture of offenders and controllers (Brantingham and Brantingham 1995) who meet there in time and space.

Previous research provides theoretical arguments regarding both positive effects as well as negative effects of business presence on deviance. On the one hand, businesses are expected to *attract* potential offenders and *decrease* the number of capable controllers. Their presence impairs resident-based control by attracting outsiders, discouraging the use of space by residents, and providing public space for which no one takes responsibility (Taylor, Gottfredson, and Brower 1981; 1984; Taylor 1988; Taylor, Koons, Kurtz, Greene, and Perkins 1995). Residents of streets with stores are less likely to interact with others, and thus non-residential land use weakens resident-based social control (Baum, Davis, and Aiello 1978). On the other hand, there is also some research suggesting positive effects of businesses. Jacobs

28 This second mechanism has not received much attention within social disorganization theory as compared to subcultural theory, differential association theory, and social learning theory. Social disorganization theory is frequently interpreted as a group-level theory of social control. Because this second mechanism of the original social disorganization theory provides arguments for the presence of motivated offenders, we have included it here.

29 Arguments to integrate social disorganization theory and routine activity theory have been made by, inter alia, Felson (1986), Miethe and Meier (1994), and Smith et al. (2000).

(1961) argues that regular customers provide eyes on the street, thereby acting as controllers or deterrents without having to act. McPherson and Silloway (1986) argue that social interaction between residents and shopkeepers of small commercial centers within neighborhoods can promote social cohesion and neighborhood attachment, thus enhance controlling behavior. Because arguments have been made for both positive and negative effects of businesses, we view these as competing hypotheses.<sup>30</sup>

Brantingham and Brantingham (1995) further argue that the effect of business presence on deviance differs by business type because business types differ in the specific mixture of offenders and controllers that they attract. They summarize these business types as *attractors*, *generators*, and *neutral* areas. Crime attractors provide many easy criminal opportunities, and motivated offenders are attracted to the business and the surrounding space specifically for that reason, e.g., bars (Gruenewald, Freisthler, Remer, LaScala, and Treno 2006; Livingston 2008; Roncek and Bell 1981). Businesses are crime generators if many people come there without any particular criminal motivation but some potential offenders may also be among the crowd and subsequently notice and exploit criminal possibilities, e.g., high schools (LaGrange 1999; Roncek and LoBosco 1983; Roncek and Faggiani 1985; Wilcox, Quisenberry, Cabrera, and Jones 2004).<sup>31</sup> Businesses are neutral areas if they neither specifically attract offenders nor create easy criminal opportunities. Thus, for some types of businesses, the number of controllers may offset the number of attracted offenders, while for other types of business the attracted offenders will outnumber the controllers.<sup>32</sup>

In practice, however, a business will never be purely of one type (Brantingham and Brantingham 1995). In addition, an exhaustive list of business types and their expected effects is not feasible. Therefore, we tentatively expect that bars and liquor stores have stronger effects on disorder than fast-food businesses, which in turn have stronger effects on disorder than high schools and supermarkets, because of the mix of actors brought together in these places.<sup>33</sup>

30 We may also expect that the presence of more businesses in a neighborhood allows for pooling resources and thus allows the group of businesses to make a stronger stand against collective problems than a few businesses would. Although we do not have data on the actual existence of such informal agreements or formal organizations (e.g., in business associations or business improvement districts), we can investigate empirically the net effect of the number of businesses.

31 In the Netherlands, some semi-legal or illegal businesses flourish despite their controversial status. Due to non-enforcement, 'coffee shops' that sell cannabis are tolerated. In addition, prostitution is legal and regulated. Of course, it would be very interesting to include those business types in our analyses. However, the dataset we used in this paper has a single category for 'specialty shops', which also includes sellers of butter, eggs, honey, coffee/tea, nuts, and spices in addition to coffee shops. Prostitution is part of a category 'other services', which includes businesses such as astrology, dog walking services, and tattoo parlors. Nonetheless, we included these abstract categories in the analysis, but the results were not significant. Moreover, the actual number of brothels and cannabis cafes are lower than is believed outside of the Netherlands – thus, we believe this would not have greatly affected our results.

32 Brantingham and Brantingham (1995) do not hypothesize crime buffering areas, areas that provide a neighborhood with many capable controllers, leading to less neighborhood disorder. Churches or other neighborhood activist organizations may have such effects. In this paper, however, we did not find such buffering effects of the presence of, e.g., churches.

33 Wilcox et al. (2004) argue for differentiating between business-oriented and non-business-oriented

Furthermore, we argue that there may be moderating effects of a neighborhood's social disorganization on the relationship between land use and crime. We expect the presence of businesses to affect disorder especially strongly in poor neighborhoods. In those neighborhoods, the businesses are situated within neighborhoods with very little resident-based social control (i.e., an interaction effect). Previous research supports this notion: e.g., Peterson, Krivo and Harris (2000) found that the presence of bars has stronger effects on robbery and rape incidents in highly deprived neighborhoods than in non-deprived neighborhoods (see also Wilcox, Quisenberry, Cabrera, and Jones 2004).

#### Business employees act as capable controllers

What has not been analyzed in the research discussed above is that besides neighborhood residents and visitors, the *employees* of the neighborhood businesses can also act as capable controllers. Not only the neighborhood residents and visitors, but also people who are working in the neighborhood can control others' potentially deviant acts. Jacobs (1961) referred to the active role that shopkeepers can play in the prevention of neighborhood problems, and Clarke (1992) explicitly focuses on the employees themselves and how they can regulate the behavior of others. Felson (2002) argues that employees are responsible for particular settings, and are probably the most important controllers in society.

To derive hypotheses on the influence of business employees on neighborhood disorder, or more generally, the influence of capable controllers on deviance, we assume that controllers' actions are broadly rational in nature. Cornish and Clarke (1986) argue that *offenders* seek to "benefit themselves by their criminal behavior; that this involves the making of decisions and of choices [...]; and that these processes exhibit a measure of rationality, albeit constrained by limits of time and ability and availability of relevant information". Here, we extend this argument by assuming that *controllers* also act according to these assumptions.

If we assume that controllers make at least limited rational decisions, then we can expect that because their livelihood depends on business survival and business survival depends on customer demand (and assuming that customers prefer shops without litter, graffiti or drunken people nearby), employees can be expected to act as capable controllers. Potential disorder generated by the attracted offenders may thus be offset by employees in the neighborhood, and we can therefore expect *less* disorder if there are *more* employees. However, the assumption that controllers behave rationally (within certain limits) also leads to an alternative expectation due to free-riding effects: when a group is sufficiently large, the incentive for any one member to act on behalf of the common good is diminished below a certain threshold. In large groups there emerges a participation paradox: a clean and safe neighborhood is a common good, which means that no one can be excluded once it is produced. Every potential controller reasons: "Why should I bear the costs of guarding the common good? Let someone else do it" (Hechter 1988). Thus, we expect less intervention if there are more employees, leading to the expectation of

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non-residential land use. Due to data availability, we could not include public playgrounds or other non-business-oriented non-residential land uses, except for a general variable reflecting the amount of 'recreation space' (see also footnote 46).

*more* disorder if there are *more* employees. As such, we have competing hypotheses. This paper is a first investigation into the role of business employees, and our data do not allow a full test of these mechanisms. Therefore, we will not formulate a specific hypothesis of the net effect of the number of employees on disorder, but explore this effect.

### 3.3 Data and methods

#### 3.3.1 Data

To test the hypotheses, data on physical disorder and social disorder from a resident survey were combined with census data on the socio-structural characteristics of neighborhoods, and data on the types of businesses and employment opportunities available in the neighborhoods.

The Police Population Monitor (PPM) is a nationwide bi-annual Computer Assisted Telephone Interviewing survey and was provided by the 'Directie Politie en Veiligheidsregio's' of the Ministry of Internal Affairs, the Hague. Residents are asked, *inter alia*, about their perception of neighborhood disorder and personal background information. Statistics Netherlands (CBS) provided information on the neighborhood-level average residential income, residential mobility, and the percentage of western and non-western migrants in each neighborhood. The LISA (in Dutch: 'Landelijk Informatiesysteem Arbeidsplaatsen') dataset provided information on neighborhood businesses.<sup>34</sup> When errors are found in this dataset, all previous years are updated with the correct information, thereby ensuring the best available complete dataset on Dutch businesses. For each business, the activity in which it engages, the number of people who work there, and its location, are recorded.

Neighborhoods are defined as 'natural areas' by Statistics Netherlands (CBS). This definition of a neighborhood is arguably better than the definition by a four-digit postal code, which is often used in studies of this kind. These CBS neighborhoods are small, homogeneous areas: there exist about 11,000 of these neighborhoods, compared to only ca. 4,000 four-digit postal code areas. Moreover, CBS gathers data at this smaller level of neighborhood, so any aggregation into four-digit postal code areas would enlarge measurement errors. Furthermore, the 2005 PPM survey uniquely includes the location of each respondent at the street level. This enabled us to locate the respondents in the actual CBS neighborhoods. Our measurement of neighborhoods is therefore more precise than those of most other studies in the Netherlands.

Previous research in the United States has been primarily conducted within urban neighborhoods and focuses on one city at a time. We improve on this research by using 278 neighborhoods nested in the four largest cities of the Netherlands, with a total of 7,927 respondents. Because we expect the inner city core with many

<sup>34</sup> LISA provides complete information on business establishments, including occupations that do not need to be registered at the chamber of commerce, e.g., dentists, architects, artists, accountants, and veterinarians.

shopping streets to be substantially different from residential areas located in the periphery, we excluded those inner-city neighborhoods as well as neighborhoods that *only* served as business districts outside the city center: we are interested specifically in *mixed use* residential neighborhoods. Furthermore, because the predictors at the neighborhood level are hypothesized to be causes of disorder, we used the relevant predictor variables measured in 2004 and used as outcome variables the perceived social disorder and physical disorder in 2005.

### 3.3.2 Measurements

*Physical disorder and social disorder.* Nine items related to disorder are used in this study. All items are measured on a three-point scale indicating whether this type of disorder occurs often, sometimes, or almost never in the respondent's neighborhood. The items were recoded so that a higher score on an item reflected a higher prevalence of disorder (almost never = 0, sometimes = 1, often = 2). Physical disorder is reflected in the following five items: (a) *noise* (non-traffic), (b) *vandalism* of phone booths, bus- or tram stops, (c) *graffiti* on walls or buildings, (d) *litter* on the street, and (e) *dog feces* on the streets and sidewalks. Four other items reflect social disorder: (a) *threatening* behavior, (b) women or men *being bothered* or *hassled* on the street, (c) *drug-related* problems, and (d) *drunk* people on the street. Table 3.1 gives an overview of the frequency of occurrence of each item value, as well as the overall means and standard deviations.

Table 3.1. Descriptive statistics for disorder variables: individual-level data, frequencies, mean and standard deviation per disorder item.

		(Almost) never	Sometimes	Often	Mean	S.D.
Physical disorder	Noise	5056	1832	1039	0.49	0.72
	Vandalism	4345	2348	1234	0.61	0.74
	Graffiti	3840	2551	1536	0.71	0.77
	Litter	2006	2229	3692	1.21	0.82
	Dog feces	1497	1875	4555	1.39	0.78
Social disorder	Threat	6468	1234	225	0.21	0.47
	Bother	5890	1661	376	0.30	0.55
	Drugs	5635	1440	852	0.40	0.67
	Drunk	5060	2056	811	0.46	0.67

Source: Police Population Monitor 2005, for cities of Amsterdam, The Hague, Rotterdam, and Utrecht in the Netherlands (N=7927 respondents).

In concordance with previous research, we created a scale from the different items. Our substantive interest is neither how a neighborhood combats very specific common problems nor how business presence affects specific forms of disorder. Instead, we see the items as indicators of the underlying 'physical disorder' or 'social

disorder'. Therefore, the items are summed into a score for each type of disorder.<sup>35</sup> Cronbach's alpha is 0.58 for the physical disorder scale and 0.68 for the social disorder scale, which is reasonable given that the scales consist of only 5 items and 4 items, respectively.

*Neighborhood-level 'business' variables.* The data of Statistics Netherlands provide a measure of business presence, or the total number of businesses in categories excluding farming, fishing, and overnight healthcare facilities.<sup>36</sup> The categories are as follows: category 1= 0-9 businesses, 2 = 10-19, 3 = 20-49, 4 = 50-99, 5 = 100-199, 6 = 200-499, 7 = 500-999, 8 = 1000-1999, and 9 = 2000+ businesses in a neighborhood.<sup>37</sup>

The LISA data were used to construct more precise business variables. First, dummies were created reflecting the presence of at least one establishment for each business type. In this manner, we can investigate whether the presence of at least one establishment of a specific business type affects neighborhood disorder. Second, we constructed variables that show the numbers of 'small', 'medium' and 'large' businesses in terms of the number of employees. For bars, fastfood restaurants and supermarkets, we treated these variables as interval. However, for liquor stores and high schools, we could not reasonably construct interval measures given their low frequency in the data. Thus, we constructed two dummies reflecting whether at least one 'small' or 'large' business is present (0 = no, 1 = yes) in the neighborhood. Table 3.2 summarizes the descriptions of the neighborhood business variables.

To classify business size as being 'small', 'medium' or 'large', we tried to find a balance between the level of detailed information for each business and its frequency of occurrence in the data. For each type of business, we constructed a variable for the number of businesses with only one employee because businesses run by only one person (the owner) could be substantially different from larger businesses, both in terms of intervention and clientele. If this was not possible because it would have resulted in a very small number of such businesses, we defined the smallest number

35 We also used the more complex 'econometrics' method (Raudenbush and Sampson 1999) to create scales of physical and social disorder within each person using the empirical Bayes residuals in an empty multilevel model. This method uses an extra level (the item-level) that consists of the response to the  $i$ th item of person  $j$  in neighborhood  $k$ , which depends on one's latent perception of (physical/social) disorder plus error. This more complex method correlates highly with the simpler method of adding the item scores into scales: for physical disorder, Pearson's  $r$  is 0.96, and for social disorder, 0.90. The analysis results are also comparable, independent of the method by which the disorder scales were created. To facilitate understanding, we therefore use our simple method here instead of the more complex method.

36 The variable is relatively imprecise because it also includes businesses that do not physically attract customers to the neighborhood (e.g., internet companies) or do not have many employees who may intervene (e.g., employees in businesses that are not really connected to 'the street'). In that sense, this variable is actually biased against finding significant results (see also McCord, Ratcliffe, Garcia, and Taylor 2007). Unfortunately, we were not able to use a variable that only captured, e.g., retail businesses.

37 We used this as an interval variable in our analyses. This variable is the first step towards exploring the role of neighborhood businesses vis-à-vis disorder. The number of businesses was entered as a categorical variable as well as an interval variable. A test for non-nested model fit using Akaike Information Criterion (AIC) showed that the best fitting model assumed an interval scale (AIC with interval variable = 62659, AIC with categorical variable = 62667). The AIC equals  $l+2p$ , where  $p$  is the number of parameters in the model,  $l$  is the deviance or  $-2 * \log \text{likelihood}$  statistic, and the model with the smallest AIC fits best (Rasbash, Charlton, Browne, Healy, and Cameron 2009; Rasbash, Steele, Browne, and Goldstein 2009).

of employees that yielded a good number of businesses in the ‘small’ category and proceeded upwards from there.<sup>38</sup> Table 3.2 provides descriptive statistics as well as the number of employees for a ‘small’, ‘medium’ or ‘large’ business of a certain type.

Table 3.2 Descriptive statistics for business-related variables.

	Min	Max	Mean	S.D.
Total number of businesses	3	7	5.42	1.07
Presence of at least one:				
Liquor store	0	1	0.53	0.50
High school	0	1	0.37	0.48
Bar	0	1	0.76	0.43
Fastfood	0	1	0.86	0.35
Supermarket	0	1	0.79	0.41
Presence of at least one:				
Small liquor store (1-2 employees)	0	1	0.34	0.47
Large liquor store (3+ employees)	0	1	0.32	0.47
Small high school (0-50 employees)	0	1	0.23	0.42
Large high school (51+ employees)	0	1	0.22	0.42
Number of:				
Small bars (1 employee)	0	18	1.44	2.34
Medium-sized bars (2-5 employees)	0	29	3.12	4.44
Large bars (6+ employees)	0	16	0.79	1.61
Small fastfood (1 employee)	0	9	1.22	1.51
Medium-sized fastfood (2-3 employees)	0	14	2.12	2.48
Large fastfood (4+ employees)	0	10	1.16	1.73
Small supermarkets (1-5 employees)	0	11	1.46	1.83
Large supermarkets (6+ employees)	0	8	1.09	1.19

Note: ‘total number of businesses’ was centered on the grand mean in the analyses. Source: LISA (Landelijk Informatiesysteem Arbeidsplaatsen) 2004 ( $N=278$  neighborhoods).

*Neighborhood variables.* Residential mobility reflects the number of movers to or from a certain neighborhood in one year per 100 residents of that neighborhood. Ethnic heterogeneity was measured as the percentage of western migrants (i.e., from Europe, North America, Oceania, Indonesia, and Japan, based on socioeconomic and cultural position relative to the native Dutch) and non-western migrants (i.e., from Turkey, Africa, Latin America, and Asia) living in each neighborhood, here recoded so that an increase of 1 reflects a 10 percent increase in reality. To capture poverty, the average income of the residents per neighborhood (after taxes) was divided by 10,000. Population density is the number of residents per hectare of land (i.e., 100 x 100 meters) divided by 10,000. Lastly, the total number of residents per neighborhood was included, also divided by 10,000, to account for differences

<sup>38</sup> Note that except for a very few supermarkets, even the largest Dutch supermarkets are small by U.S. standards.

in neighborhood size. All of these variables were centered on their grand means so that the intercept of the model reflects the amount of disorder for an average neighborhood. Table 3.3 summarizes the statistics for these variables.

Analysis for multicollinearity between neighborhood-level predictors shows that the percentage of (non-) western foreigners correlates with the average neighborhood income (western:  $r = .78$ ; non-western:  $r = -.74$ ). Thus, western foreigners live in relatively affluent neighborhoods, while non-western foreigners live in relatively poor neighborhoods. To be able to compare with these previous studies, we included both the percentage of non-western and the percentage of western foreigners living in the neighborhood as predictors in our model. The numbers and types of businesses also tend to cluster somewhat within neighborhoods, but the analyses for multicollinearity did not lead us to believe that this influenced our results (tables available on request).

Table 3.3 Descriptive statistics for 'social disorganization' neighborhood variables and individual-level variables.

	Uncentered		Centered		S.D.
	Min	Max	Min	Max	
<i>Neighborhood-level variables</i>					
Residential mobility (moves per 100 residents)	.49	3.13	-0.86	1.78	0.40
10% western immigrants	.20	3.30	-1.06	2.04	0.56
10% non-western immigrants	.10	9.00	-2.59	6.31	2.04
Neighborhood income (/10000 euro)	.75	2.74	-0.56	1.43	0.32
Population density (/10000 residents / ha)	.01	2.70	-0.98	1.72	0.59
Number of residents (/10000)	.02	2.75	-0.61	2.12	0.44
<i>Individual-level variables</i>					
Age	15	95	-35.59	44.41	17.74
Female	0	1	-0.55	0.45	0.50
Unemployed	0	1	-0.43	0.57	0.49
Education	1	7	-3.69	2.31	1.94
	Freq	Percent			
Native Dutch	6870	86.67			
Western foreign	230	2.90			
Non-western foreign	429	5.41			
Other foreign	398	5.02			

Note: Neighborhood-level variables are grand-mean centered in analyses; in table 3.3, both uncentered and centered values are shown. Source: Statistics Netherlands 2004,  $N=278$  neighborhoods. Age, female, unemployed and education are grand mean centered in analyses, and the reference group for ethnicity is native Dutch. Source: Police Population Monitor 2005, for respondents in cities of Amsterdam, The Hague, Rotterdam, and Utrecht in the Netherlands,  $N=7927$  respondents across 278 neighborhoods.

*Individual-level variables.* If the perception of disorder is systematically influenced by personal characteristics of the respondents and people with similar characteristics tend to cluster together in neighborhoods, the perceived neighborhood disorder is not correctly estimated (i.e., a composition effect). For example, a neighborhood may not really be more littered than other neighborhoods, but if many elderly people live in that neighborhood, they may *perceive* and thus report litter more readily.

Thus, compositional differences of neighborhoods need to be taken into account by controlling for individual characteristics. The PPM dataset permits controlling for the following individual characteristics: age (in years), level of education in seven categories, status of employment (0 = employed, 1 = unemployed), gender (0 = male, 1 = female), and the country of birth of the respondent (1 = Netherlands, 2 = western country, 3 = non-western country, 4 = other/unknown).<sup>39</sup> The descriptive statistics for these variables are presented in table 3.3.

### 3.3.3 Method

#### Multivariate multilevel analysis

Multilevel analysis is employed to correct the correlation of measurement errors at different levels (Snijders and Bosker 1999). In addition, because physical and social disorder measurements are conceptually and empirically related, we estimated these two dependent variables simultaneously in all of the models. We employ a three-level model: (1) the two dependent variables, physical disorder and social disorder, are nested (2) within respondents, which are nested (3) within neighborhoods. There is no significant variation between the four cities, so we do not account for differences at the city level. The model has no level-1 variation specified because level-1 only exists to define the multivariate structure. In all models, we control for individual perception bias by including individual-level covariates, and we add neighborhood-level covariates to explain physical disorder and social disorder.

#### Spatial dependence

According to Waldo Tobler's (1970) first law of geography, "everything is related to everything else, but near things are more related than distant things". In our models, individual data are nested within neighborhoods. This already represents a spatial dependence that is taken care of in the multilevel models. However, on the neighborhood level, dependence between localized observations can still be present. Positive 'spatial autocorrelation' occurs when high or low values of a variable tend to cluster in space, and negative spatial autocorrelation occurs when geographical areas tend to be surrounded by neighbors with very dissimilar values. Spatial dependence between observations causes biases in the estimated effects (Bernasco and Elffers 2010). Applying spatial models is a common way to optimally take care of spatial dependence in clustered observations (Anselin 1988).

The measurement of global spatial autocorrelation in this paper<sup>40</sup> is based on Moran's  $I$ <sup>41</sup> statistic (Anselin 1988), which is the most widely known measure of

39 Similarly to the variable 'number of businesses', education was entered as a categorical variable as well as an interval variable. A test for non-nested model fit using the Akaike Information Criterion (AIC) showed that the best fitting model assumed education as an interval variable. Thus, we used education as an interval variable in subsequent analyses.

40 We use row-standardized weight matrices (the preferred way to implement Moran's  $I$  statistic).

41 The theoretical variance of Moran's  $I$  depends on the stochastic assumptions made. Either the assumption of a normal distribution of the variables in question (normality assumption), the assumption that each value observed could equally likely have occurred at all locations (randomization assumption, used most often) or a randomization approach using a reference distribution for  $I$  that is generated empirically

spatial clustering.<sup>42</sup> Inference is based on a standardized z-value of  $I$  that is computed by subtracting the mean and dividing the result by the standard deviation. A positive and significant z-value for Moran's  $I$  indicates positive spatial autocorrelation. Similar values of the variable, either high or low, are more spatially clustered than could be caused purely by chance. In contrast, a negative and significant z-value for Moran's  $I$  indicates negative spatial autocorrelation, which comes down to a correlation between clusters that is lower than would be expected by chance. The results for Moran's  $I$  are to a large extent determined by the choice of the spatial weight matrix. In general, a pattern of decreasing autocorrelation with increasing orders of relation (contiguity) is typical of many spatial autoregressive processes.<sup>43</sup>

If spatial autocorrelation is present, regression models can incorporate a spatial lag or error component reflecting the spatial dependence in the dependent variable; incorporate spatially lagged explanatory variables; or, incorporate both at the same time (Durbin model). The distinction between the spatial lag and spatial error specifications is important because in the former case, disorder in one location is linked to disorder in other locations, whereas in the latter case, linkages between locations occur via the error generation process. Because we did not have a priori substantive hypotheses about the effect of explanatory variables of surrounding areas on the disorder in the *focal* area, we tested both x-lagged and y-lagged specifications of spatial autocorrelation. Models incorporating a spatial lag of disorder (instead of spatial lags of explanatory variables) take care of the spatial dependence sufficiently to assure unbiased conclusions on the explanatory variables in the multilevel model.

For each model shown in tables 5-7, we completed the following steps of analysis: (1) we first estimated each multivariate multilevel model without a spatial lag component; (2) we used the neighborhood level residuals to test whether there was spatial autocorrelation according to Moran's  $I$ ; (3) in each model this turned out to be the case (and as expected, the spatial autocorrelation decreased with each subsequent model because of the inclusion of explanatory variables); (4) we constructed the spatial lag components for physical disorder and social disorder and added these as a control variable in the model; (5) and we tested for remaining spatial autocorrelation on the new neighborhood level residuals.

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(permutation assumption) can be tested for. Van Oort (2004) tested these assumptions for postal codes for one Dutch province ( $n = 416$ ) and found that the results of the three models of inference specification are very similar in terms of significance. In this paper, we only present the results for the randomization assumption.

42 Other well-known measures are Geary's c-statistic and Getis and Ord's  $G$ -statistic (Anselin 1995).

43 In this paper, first- and second-order distance weight matrices were tested in spatial autoregressive modeling, but for reasons of parsimony, we will only present analyses using the first-order (inverse distance) weight matrices that fitted our data best. Earlier research on the level of Dutch neighborhoods used a similar weight matrix (Van Oort 2004).

## 3.4 Results

### 3.4.1 Intercept-only model

An intercept-only model provides information on how the total variance in physical disorder and social disorder is distributed across the individual level and the neighborhood level. It also provides information on the average disorder across all neighborhoods while taking into account the nested structure of the dataset, as well as the spatial dependence. In addition, it provides an estimation of the correlation between physical disorder and social disorder. Table 3.4 shows the results for both physical disorder and social disorder after controlling for spatial dependence of disorder. We will discuss spatial dependence of all models separately in the section titled ‘Spatial dependence’.

Table 3.4 Empty multilevel model, without any explanatory variables

	Physical disorder		Social disorder																					
	B	S.E.	B	S.E.																				
<b>Fixed effects</b>																								
Intercept	4.342	0.050**	1.346	0.042**																				
Spatial coefficient	3.705	0.412**	3.702	0.306**																				
<b>Random effects</b>																								
Neighborhood-level variance	0.326	0.050**	0.268	0.036**																				
Individual-level variance	4.921	0.079**	2.286	0.037**																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="2">Covariance</th> <th>Correlation</th> </tr> <tr> <th></th> <th>B</th> <th>S.E.</th> <th></th> </tr> </thead> <tbody> <tr> <td colspan="4"><b>Covariance and correlation</b></td> </tr> <tr> <td>Neighborhood-level</td> <td>0.196</td> <td>0.035**</td> <td>0.662</td> </tr> <tr> <td>Individual-level</td> <td>1.406</td> <td>0.041**</td> <td>0.419</td> </tr> </tbody> </table>						Covariance		Correlation		B	S.E.		<b>Covariance and correlation</b>				Neighborhood-level	0.196	0.035**	0.662	Individual-level	1.406	0.041**	0.419
	Covariance		Correlation																					
	B	S.E.																						
<b>Covariance and correlation</b>																								
Neighborhood-level	0.196	0.035**	0.662																					
Individual-level	1.406	0.041**	0.419																					
Deviance	63139.754																							

\*\*  $p < 0.01$  (two-tailed tests). Source: PPM 2005 ( $N=7927$  respondents).

An average neighborhood has more perceived physical disorder (4.34) than social disorder (1.35), even taking into account that physical disorder has a greater outcome range (0-10) than social disorder (0-8). For physical disorder, 95 percent of all neighborhoods fall between 3.77 and 4.91 (a range of two standard deviations around the mean). For social disorder, 95 percent of all neighborhoods fall from 0.83 to 1.86.

The intra-class correlation estimates how much of the variance of disorder can be attributed to the neighborhood level (i.e., dividing the neighborhood level variance by the total variance). About 6.2 percent of the variation in perceptions of physical disorder can be attributed to the 278 neighborhoods, whereas this value is 10.5 percent for social disorder. People within the same neighborhood agree more easily on the occurrence of social disorder indicators than on the occurrence of physical disorder.<sup>44</sup> The correlation between the two types of disorder can be

44 The relatively low numbers are not necessarily problematic: Raudenbush and Sampson (1999) note that

calculated from the covariance between physical disorder and social disorder. On the individual level, this provides a correlation coefficient of 0.42, which is a moderately strong correlation. A stronger correlation is found on the neighborhood level, namely 0.66.<sup>45</sup>

### 3.4.2 Perceptual differences of disorder

As we stated before, if the perception of disorder is systematically influenced by personal characteristics and people with similar characteristics tend to cluster together in neighborhoods, the perceived neighborhood disorder is not correctly estimated. Compositional differences of neighborhoods need to be taken into account by controlling for individual characteristics. Except for age, individual characteristics have a stronger effect on the perception of physical disorder than the perception of social disorder. Elderly people are more likely to report less physical and social disorder than younger people in the same neighborhood. Women and the highly educated report more physical and social disorder in comparison with men and less educated people. Foreigners report less physical disorder than native Dutch in the same neighborhood. For social disorder, only the 'other' category of foreigners significantly reports less disorder than native Dutch (tables not shown here).

### 3.4.3 Physical disorder

The results for physical disorder are shown in table 3.5. Model 1 starts with the traditional explanations from social disorganization theory, and our expectations are partly supported. Neighborhoods with more residential mobility, lower average income, greater population density, and a larger number of residents have more physical disorder. When controlling for the aforementioned variables, the percentage of migrants has no significant effect on physical disorder, contrary to expectations. Next, we compare the effects of a one-standard-deviation increase of predictor variables on physical disorder. For residential mobility, a one-standard-deviation increase (0.40) results in an increase of physical disorder by about 0.23. For income, a one-standard-deviation increase (0.32) decreases physical disorder by about 0.34. For population density and the number of residents, a one-standard-deviation increase of each leads to an increase of physical disorder of 0.12.<sup>46</sup>

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large neighborhood effect sizes can give rise to an intra-class correlation as low as 0.14.

- 45 This correlation coefficient could also be a reason to collapse the two disorder scales into one scale. We chose to keep them separate and allow them to covary in every model because this enables differences in parameter estimates of the explanatory variables to be seen for both types of disorder separately.
- 46 An anonymous reviewer noted that in large Dutch cities, high population density neighborhoods may have lots of open space or very little open space depending on their age, and open space may provide opportunities for physical disorder. To test this hypothesis, we added a variable that captures the amount of 'recreation space' in the neighborhood as a percentage of the total neighborhood area (mean = 11 percent, s.d. = 12 percent). This new variable does not affect any of our substantive results. We found that the percentage of recreation space had a positive significant effect on physical disorder but not on social disorder. A 10 percent increase in open space resulted in about 0.1 more physical disorder (on a scale of 0-10).

Table 3.5 Parameter estimates of multilevel multivariate models with regard to physical disorder (results w.r.t. social disorder are presented in table 3.6)

Physical disorder	Model 1		Model 2		Model 3		Model 4	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
<b>Fixed effects</b>								
Intercept	4.471	0.042**	4.487	0.042**	3.408	0.170**	4.055	0.103**
<i>Social disorganization</i>								
Residential mobility	0.585	0.129**	0.519	0.129**	0.477	0.125**	0.427	0.128**
Western immigrants	0.050	0.148	-0.049	0.153	-0.137	0.144	-0.110	0.147
Non-western immigrant	0.013	0.033	0.012	0.033	-0.006	0.033	0.044	0.033
Income	-1.067	0.322**	-1.067	0.319**	-0.793	0.310*	-0.958	0.310**
Population density	0.199	0.088*	0.207	0.086*	0.238	0.083**	0.172	0.090+
Number of residents	0.268	0.101**	0.014	0.137	-0.003	0.108	-0.118	0.132
<i>Neighborhood businesses</i>								
Total number of businesses			0.187	0.061**				
Presence of at least one:								
Liquor store					0.148	0.097		
High school					0.101	0.079		
Bar					-0.048	0.127		
Fastfood					0.557	0.163**		
Supermarket					0.490	0.153**		
Presence of at least one:								
Small liquor store							0.014	0.090
Large liquor store							0.133	0.091
Small high school							-0.013	0.087
Large high school							0.152	0.091+
Number of:								
Small bars							0.020	0.020
Medium-sized bars							0.023	0.014
Large bars							0.039	0.034
Small fastfood							-0.018	0.034
Medium-sized fastfood							0.010	0.023
Large fastfood							0.043	0.027
Small supermarkets							-0.021	0.027
Large supermarkets							0.090	0.041*
Spatial coefficient	4.629	1.391**	4.020	1.486**	-0.939	2.125	4.726	1.581**
<b>Random effects</b>								
Neighborhood-level variance	0.164	0.031**	0.154	0.030**	0.125	0.026**	0.117	0.026**
Individual-level variance	4.731	0.076**	4.732	0.076**	4.731	0.076**	4.735	0.076**
Deviance	62602.500		62587.327		62549.999		62527.897	

\*\*  $p < 0.01$ , \*  $p < 0.05$ , +  $p < 0.1$  (two-tailed tests). Note: in all models we also controlled for individual-level perception bias. Source: LISA 2004, CBS 2004, PPM 2005.

Model 2 adds local businesses as an explanatory mechanism for physical disorder. Even with the relatively crude measure of ‘total number of businesses’, we find that the total number of businesses is related to more physical disorder and is highly significant ( $p < .01$ ). Even when controlling for the variables known to be highly related to deviance, a one-standard-deviation increase in the number of businesses increased the perceived physical disorder by about 0.20, which is almost as large as or larger than the effects of residential mobility, population density, and the number of residents.

As was suggested theoretically, a specific subset of businesses may be especially related to disorder, and therefore we explored the role of these businesses more specifically in model 3. In this model, dummies reflect whether at least one storefront of such a business is present (1) or not (0). Of the five investigated business types, the presence of fast-food restaurants ( $p < .01$ ) and supermarkets ( $p < .01$ ) is positively related to physical disorder. If both are present in the neighborhood, these business types increase physical disorder by 1.05.<sup>47</sup>

Model 4 shows the effects of the presence of each business type as well as the effect of its size in terms of the number of employees. Liquor stores and high schools do not exist in enough neighborhoods to warrant an interval variable reflecting their exact number. Therefore, these two kinds of businesses remain in the analysis as dummy variables, but we changed each into two dummies reflecting small and large establishments, respectively. Conversely, multiple bars, fast-food restaurants and supermarkets of different sizes were present in many neighborhoods. Therefore, we included interval variables reflecting the number of those businesses of each size.

When taking the number of employees in each business type into account, large high schools and large supermarkets are related to more physical disorder. For these types of businesses, size does matter for the occurrence of physical disorder. However, the effect sizes are relatively small, comparable to the effect sizes of population density and the number of residents; 0.15 for the presence of at least one large high school and 0.11 for a one-standard-deviation increase in large supermarkets. We do *not* find instances where smaller neighborhood businesses actually *decrease* the neighborhood’s physical disorder.

#### 3.4.4 Social disorder

Table 3.6 presents the results of the same models for social disorder as the dependent variable. Model 1 gives support for social disorganization theory, but not all expectations are supported: the percentage of western migrants and neighborhood income are not significantly related to social disorder. In contrast to the model of physical disorder, a higher percentage of non-western migrants living in the neigh-

47 Although we do not show this in the tables, we also explored the effects of primary schools, cultural institutions (i.e., libraries and museums), churches, and semi-legal or tolerated businesses (i.e., brothels and cannabis selling points, though these business types are contained within a large category of ‘other services’ or ‘specialty shops’) on physical and social disorder. We did not find any significant results either when including these ‘businesses’ as a dummy variable as in model 3 of tables 3.5 and 3.6 or when taking the number of employees into account as well, as per model 4 of tables 3.5 and 3.6.

Table 3.6 Parameter estimates of multilevel multivariate models with regard to social disorder (results w.r.t. physical disorder are presented in table 3.5)

Social disorder	Model 1		Model 2		Model 3		Model 4	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
<b>Fixed effects</b>								
Intercept	1.378	0.037**	1.400	0.036**	0.826	0.141**	0.824	0.082**
<i>Social disorganization</i>								
Residential mobility	0.386	0.109**	0.298	0.107**	0.253	0.108*	0.103	0.099
Western immigrants	0.058	0.123	-0.058	0.125	0.010	0.121	-0.114	0.113
Non-western immigrant	0.138	0.028**	0.138	0.027**	0.167	0.029**	0.182	0.026**
Income	-0.092	0.270	-0.117	0.263	0.005	0.263	0.050	0.239
Population density	0.296	0.074**	0.291	0.071**	0.248	0.071**	0.200	0.069**
Number of residents	-0.147	0.089+	-0.469	0.117**	-0.332	0.097**	-0.597	0.104**
<i>Neighborhood businesses</i>								
Total number of businesses			0.235	0.051**				
Presence of at least one:								
Liquor store					0.245	0.085**		
High school					-0.097	0.071		
Bar					0.285	0.107**		
Fastfood					0.096	0.135		
Supermarket					0.115	0.126		
Presence of at least one:								
Small liquor store							0.100	0.071
Large liquor store							0.013	0.072
Small high school							-0.147	0.069*
Large high school							0.074	0.072
Number of:								
Small bars							0.008	0.016
Medium-sized bars							0.026	0.011*
Large bars							0.083	0.029**
Small fastfood								
Small fastfood							0.004	0.028
Medium-sized fastfood							0.036	0.018*
Large fastfood							0.046	0.021*
Small supermarkets								
Small supermarkets							-0.005	0.022
Large supermarkets							0.115	0.033**
Spatial coefficient	3.863	0.591**	3.823	0.718**	3.670	0.679**	3.889	1.126**
<b>Random effects</b>								
Neighborhood-level variance	0.168	0.025**	0.153	0.023**	0.143	0.022**	0.095	0.017**
Individual-level variance	2.216	0.036**	2.216	0.036**	2.216	0.036**	2.218	0.036**
Deviance	62602.500		62587.327		62549.999		62527.897	

\*\*  $p < 0.01$ , \*  $p < 0.05$ , +  $p < 0.1$  (two-tailed tests). Note: in all models we also controlled for individual-level perception bias. Source: LISA 2004, CBS 2004, PPM 2005.

neighborhood relates to a higher perception of social disorder, with an effect size of 0.28 for a one-standard-deviation increase. Only residential mobility and population density have similar effects across the two types of disorder and increase social disorder by about 0.15 and 0.17, respectively, for a one-standard-deviation increase. Lastly, neighborhoods with more residents experience less social disorder, though this effect is only marginally significant.

In model 2, the number of all business establishments is related to more social disorder. For social disorder, we find a stronger effect of the number of businesses than for physical disorder (a one-standard-deviation increase equals an increase of social disorder of 0.25). The effect of the number of neighborhood businesses is similar to the strongest explanatory variable of social disorganization theory, the percentage of non-western migrants. Clearly, the number of businesses in a neighborhood is important for the explanation of social disorder, even after controlling for the traditional explanations.

Repeating this analysis with a specific subset of businesses in model 3, the results indicate that neighborhoods with at least one liquor store and at least one bar experience more social disorder. If both are present in the neighborhood, these business types increase social disorder by 0.53 (0.245+0.285). As with physical disorder, the presence of at least one high school does not significantly affect social disorder. Moreover, the results indicate that the presence of a fast-food establishment or a supermarket also does not affect the neighborhood's social disorder, in contrast to our previous findings. Such establishments add uniquely to the physical problems in the neighborhood, but not to its social problems.

Interestingly, the estimates in model 4 show that neighborhoods with small high schools actually experience less social disorder than neighborhoods without such schools. In contrast to physical disorder, we find that other business types have positive effects on social disorder, i.e., a greater number of such businesses results in more social disorder. Medium-sized bars and fast-food establishments (both  $p < .05$ ), as well as medium-sized bars ( $p < .05$ ) and large bars ( $p < .01$ ), increase social disorder. Medium-sized bars and large bars increase social disorder similarly for a one-standard-deviation increase of 0.12 and 0.14, respectively. Comparable to physical disorder, the number of large supermarkets contributes significantly to more social disorder.

### 3.4.5 Interaction effects

Table 3.7 shows the results of including interaction effects between the business variables in model 4 and social disorganization variables. We consistently find that the neighborhood income interacts with the number (or presence) of businesses in the neighborhood. In general, poor neighborhoods with many businesses are worse off than rich neighborhoods with many businesses. Although we included the individual-level covariates as well as the other social disorganization variables, table 3.7 only shows the main effects and interaction effects between neighborhood income and the businesses.

For physical disorder, the presence of a small or large liquor store was not significant in model 4 but now significantly interacts with neighborhood income:

Table 3.7 Parameter estimates of interaction effects

	Physical disorder		Social disorder	
	B	S.E.	B	S.E.
<b>Fixed effects</b>				
Intercept	4.121	0.103**	0.807	0.080**
<i>Main effects</i>				
Income	-0.975	0.379*	0.700	0.282*
Presence of at least one:				
Small liquor store	1.097	0.381**	1.103	0.293**
Large liquor store	1.026	0.430*	1.154	0.330**
Small high school	0.088	0.396	-0.146	0.308
Large high school	-0.166	0.344	0.430	0.267
Number of:				
Small bars	-0.079	0.137	0.261	0.106*
Medium-sized bars	-0.088	0.072	-0.014	0.056
Large bars	0.123	0.211	0.108	0.165
Small fastfood	-0.260	0.174	-0.209	0.135
Medium-sized fastfood	0.032	0.110	0.142	0.086+
Large fastfood	0.165	0.161	-0.106	0.123
Small supermarkets	-0.033	0.125	-0.017	0.097
Large supermarkets	-0.547	0.191**	0.107	0.148
<i>Interactions with income</i>				
Small liquor store	-0.794	0.274**	-0.733	0.211**
Large liquor store	-0.691	0.321*	-0.815	0.246**
Small high school	-0.116	0.303	0.027	0.235
Large high school	0.263	0.250	-0.220	0.193
Small bars	0.076	0.114	-0.207	0.088*
Medium-sized bars	0.081	0.056	0.020	0.043
Large bars	-0.087	0.156	0.000	0.120
Small fastfood	0.201	0.141	0.173	0.109
Medium-sized fastfood	-0.007	0.094	-0.092	0.073
Large fastfood	-0.091	0.123	0.125	0.094
Small supermarkets	0.000	0.098	0.015	0.076
Large supermarkets	0.506	0.154**	0.000	0.118
<b>Random effects</b>				
Neighborhood-level variance	0.088	0.022**	0.069	0.014**
Individual-level variance	4.734	0.076**	2.217	0.036**
Deviance	62462.289			

\*\*  $p < 0.01$ , \*  $p < 0.05$ , +  $p < 0.1$  (two-tailed tests). Note: also controlled for spatial dependence, perception bias and social disorganization variables. Source: LISA 2004, CBS 2004, PPM 2005.

the presence of such businesses in poor neighborhoods relates to higher levels of physical disorder. For the number of large supermarkets, the interaction points in the other direction: the number of large supermarkets seems to decrease physical disorder in poor neighborhoods but increase physical disorder in rich neighborhoods. However, descriptive statistics show that in both rich and poor neighborhoods, there are at most only two or three large supermarkets present, depending on our cutoff point that indicates rich neighborhoods. In contrast, some neighborhoods of average wealth have as many as eight large supermarkets. Therefore, we should only compare neighborhoods with a few large supermarkets, and then the interaction tells a similar story: poor neighborhoods with a few large supermarkets fare worse than wealthier neighborhoods with a few large supermarkets.

For social disorder, including interactions between businesses and income resulted in a significant and positive main effect of income in the analysis. This indicates that when there are no businesses present in a neighborhood, residents of richer neighborhoods actually reported more social disorder than residents of poorer neighborhoods. For poor neighborhoods, having a (small or large) liquor store results in more social disorder. Moreover, residents of poor neighborhoods with a higher number of small bars report greater social disorder, while residents of rich neighborhoods with many small bars only report moderate social disorder.

### 3.4.6 Spatial dependence

As discussed in the methods section, the results may be biased when we assume independence between observations when in fact the data have spatial dependence. Standard multilevel analysis in itself is not sufficient to account for this type of dependence. In all models except model 3 for physical disorder, there was strong support for initial spatial dependence, and we therefore included a spatial coefficient in each model. The inclusion of this spatial coefficient resulted in a non-significant subsequent Moran's *I* test for spatial dependence (a table comparing Moran's *I* before and after controlling for spatial dependence is available upon request). The parameter estimates indicate that neighborhoods in which the surrounding areas experience a lot of physical disorder also experience more physical disorder themselves, and these results are similar for social disorder. In models 1-3, we find that the effect sizes of spatial dependence are stronger for social disorder than for physical disorder, while in the latter models the effects are comparable.

It is especially interesting to compare the intercept-only 'empty' model excluding and including a control variable for spatial dependence, which is presented in table 3.8. The estimated averages of physical disorder (4.27 without a spatial coefficient) and social disorder (1.24 without a spatial coefficient) are comparable, but the neighborhood-level variances differ greatly. The model without a spatial coefficient estimates 0.512 and 0.503 for physical disorder and social disorder, respectively, whereas these variances are 0.326 and 0.268 in table 3.4. Not accounting for spatial dependence results in overestimation of neighborhood differences.

Because the individual-level variances are the same, the intra-class correlation is similarly overestimated when we do not correct for spatial dependence. A model without a spatial coefficient suggests intra-class correlations of 9.4 percent and 18

percent for physical disorder and social disorder, respectively, instead of the more conservative 6.2 percent and 10.5 percent. Failing to account for spatial dependence would also have led us to believe that the neighborhood-level correlation between physical disorder and social disorder is even stronger than 0.66, namely 0.78.

We also tested whether the *physical* disorder of the surrounding neighborhoods affected the *social* disorder in the focal neighborhood and vice versa. We did not find such spatial dependence in any of our models. Neighborhoods with physical disorder cluster spatially, as do neighborhoods with social disorder, but we did not find evidence for ‘cross-type’ spatial dependence.

Table 3.8 Intercept-only models with and without spatial coefficient

	Excluding spatial dependence				Including spatial dependence			
	Phys.disorder		Soc.disorder		Phys.disorder		Soc.disorder	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
<b>Fixed effects</b>								
Intercept	4.266	0.057**	1.242	0.052**	4.342	0.050**	1.346	0.042**
Spatial coefficient					3.705	0.412**	3.702	0.306**
<b>Variance</b>								
Neighborhood-level	0.512	0.069**	0.503	0.060**	0.326	0.050**	0.268	0.036**
Individual-level	4.921	0.079**	2.287	0.037**	4.921	0.079**	2.286	0.037**
<b>Covariance, correlation</b>								
	Covariance		Correlation		Covariance		Correlation	
	B	S.E.			B	S.E.		
Neighborhood-level	0.398	0.056**	0.784		0.196	0.035**	0.662	
Individual-level	1.406	0.041**	0.419		1.406	0.041**	0.419	
Deviance	63258.73				63139.75			

\*\*  $p < 0.01$ , \*  $p < 0.05$ , +  $p < 0.1$  (two-tailed tests). Source: PPM 2005.

### 3.5 Conclusion

Our analyses partly support the traditional explanations provided by social disorganization theory to explain neighborhood differences in disorder. In particular, we found that more residential mobility, lower income and higher population density enhance *physical* disorder. The percentage of (non-)western migrants is not related to physical disorder. For *social* disorder, residential mobility, a higher percentage of non-western migrants and a higher population density positively affect the outcome. In contrast to physical disorder, however, neighborhood income does not affect social disorder. The effect of neighborhood size (in terms of number of residents) differs between model specifications: when it is significant, neighborhoods with more residents experience *more* physical disorder but *less* social disorder. For physical disorder, the most *robust* explanations across all models are residential mobility and neighborhood income, while for social disorder, the ethnic heteroge-

neity of a neighborhood, the population density, and the number of residents better explain the data.

The analyses show that the presence of a larger local economy (i.e., the total number of all business establishments in a neighborhood) leads to more physical disorder *and* social disorder. This measure is relatively imprecise because it also includes businesses that do not physically attract customers to the neighborhood or do not have many employees who may intervene, but we still find strongly significant results that rival the explanatory power of the separate social disorganization explanations. Next, we used more precise measures on specific types of business. The presence of fast-food establishments and the presence of supermarkets turned out to be important predictors of physical disorder. For social disorder, the relevant businesses are liquor stores and bars.

Moreover, we find effects of the number of employees. Large high schools and large supermarkets add significantly to the neighborhood's physical disorder. For social disorder, medium-sized and large bars, medium-sized and large fast-food establishments, and large supermarkets have positive effects. Finally, in contrast to physical disorder, a neighborhood with at least one small high school experiences *less* social disorder.

Lastly, we find that effects of liquor stores on physical and social disorder are moderated by neighborhood income, thereby supporting our argument that business presence is especially detrimental in already disadvantaged neighborhoods. In addition, we find similar moderating effects for large supermarkets (with respect to physical disorder) and small bars (with respect to social disorder).

### 3.6 Discussion

Combining two theories of deviance, social disorganization theory and routine activities theory, the empirical results shed light on the relative explanatory power of each theory. The explanations of social disorganization theory are more robust across both types of disorder, but the presence of businesses rivals these explanations. This suggests that explanations of neighborhood disorder based solely on the social disorganization perspective overlook the fact that neighborhood businesses are important contributors to the explanation of physical and social disorder. In addition, we argued that neighborhood employees are important actors to better explain social and physical disorder, and our empirical results confirm that for some types of business, size matters. We also made a first step to evaluate the robustness of social disorganization theory in a different setting than American cities while simultaneously accounting for business presence and the number of employees in each neighborhood.

We believe that we have opened up a fruitful area of further research: we stress that neighborhoods are not only places where people live, but also places where people work and spend their leisure time. Moreover, we believe that a recasting of current theory towards a focus on the actions of interdependent individuals is necessary as well as promising. With regard to disorder, a form of deviance specifically found in public spaces, individual actors can be either potential offenders,

who may act in a deviant manner, or controllers, who may intervene. Although an explanation of the spatial distribution of disorder should also include such conditions as poverty, ethnic heterogeneity, and population turnover of a neighborhood, this is only one part of the explanation. The social disorganization theory provides arguments on the *propensity* towards disorder. The rest of the explanation, and one more suited to the *occurrence* of disorder, is sought in the meeting in time and space of interdependent actors.

Though also often lacking in other studies, we feel the main weakness of this study is that we could not directly include the amount of social control and trust among the residents in each neighborhood. Instead, we try to add to the current debate by using data on the presence of businesses and employees in each neighborhood. We can be sure that we have included all possible businesses (of a certain type) because we used a complete dataset of businesses instead of our own observation or asking the residents themselves about the presence of neighborhood businesses in a survey.

Our data did not allow us to simultaneously analyze the consequences of physical and social disorder on business presence. To some extent, the presence of businesses in a neighborhood is a result of community safety rather than a cause: merchants may hesitate to open a business in a neighborhood with high levels of crime. It is of course possible that disorder prior to 2004 resulted in selective in- and out-movement of businesses, which resulted in the distribution of business types and sizes across neighborhoods in 2004. However, because we used the social disorganization indicators and the business variables in 2004 to predict disorder in 2005, we feel confident enough to at least tentatively speak about 'cause' and 'effect'. Future research would ideally explore the causes and consequences of a prospering neighborhood economy vis-à-vis the neighborhood's physical and social disorder with longitudinal data.

In addition to the possibilities for future research mentioned above, actual *intervention* by neighborhood actors should be investigated more fully. As indicated in the theoretical part of this paper, it is unclear under which circumstances individual actors actually intervene. For example, if others are present who might also intervene, individual actors may refrain from doing so because of free-riding behavior. Thus, research should not focus only on explanations and outcomes on the neighborhood level, but also give attention to the individually interdependent micro-explanations underpinning these neighborhood outcomes. In this respect, people who live and work in the same neighborhood (i.e., home-based entrepreneurs) are especially interesting in comparison to regular residents. These actors combine two spheres of life in the same place, have more stakes in the neighborhood than regular residents, and can therefore be expected to exercise more social control than regular residents or neighborhood employees.

Because business success depends on the environment (i.e., neighborhood) in which the business operates, we could expect that business employees will intervene in problematic situations, and do more for the public good than regular residents. However, this study reveals that neighborhoods with larger businesses (i.e., more employees) have more perceived physical and social disorder than neighborhoods with smaller businesses. Perhaps the business employees are not *capable*

controllers, i.e., they do not take action on behalf of the neighborhood, or large businesses attract too large a group of offenders, or large (“chain”) businesses more easily survive in or move to disorderly neighborhoods than small businesses. Further research using longitudinal data and investigating the actions of the interdependent actors (i.e., neighborhood residents, employees, and business owners) on behalf of the neighborhood is needed to solve this puzzle.



## Chapter 4

### MEASUREMENT OF NEIGHBORHOOD CHARACTERISTICS



A slightly different version of this paper was published in Dutch as a book chapter in *Problemen in wijken of probleemwijken?* (Musterd and Ostendorf 2009).

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# Measurement of neighborhood characteristics

## 4.1 Introduction

This paper has two goals. First, it serves as a methodological companion to chapter 2 and chapter 3. In these chapters, variables reflecting ‘social cohesion’ and ‘disorder’ were constructed by aggregating the opinions of neighborhood residents to one neighborhood ‘score’, but the method of aggregation was discussed very briefly. Here, the method is discussed more extensively. Specifically, I describe two ways of aggregation. Many previous studies have taken the mean of all neighborhood residents’ opinions, which I call the ‘traditional’ method. I discuss the disadvantages of this method of aggregation and describe a relatively recent other method, i.e., ‘ecometrics’ (Raudenbush and Sampson 1999). This more sophisticated latter method takes into account the frequency of occurrence of the problems, as well as disagreements between the neighborhood respondents. It also takes into account the number of respondents interviewed in each neighborhood: a neighborhood with many respondents receives a more reliable score than a neighborhood with few respondents.

The second goal of this paper is to compare the ‘traditional’ method of aggregation to the ‘ecometrics’ method, in order to ascertain how much of an improvement the latter method actually makes. Many researchers now use the ‘ecometrics’ method to construct neighborhood-level variables which are used as predictor variables in subsequent analyses. In addition, there are also papers which have the assessment of the measurement properties of neighborhood scales as their substantive subject (e.g., Mujahid, Diez Roux, Morenoff, and Raghunathan 2007). However, I do not know of studies which explicitly compare the neighborhood-level variables constructed by the ‘traditional’ method and the more sophisticated ‘ecometrics’ method. This is surprising, as the (possibly problematic) consequences of using the ‘traditional’ method can only become clear by comparing the results of both methods. I will use the recent discussion about the forty most disadvantaged Dutch neighborhoods as a case in point.

## 4.2 Measurement of neighborhood-level characteristics

There are several ways to determine the characteristics of a neighborhood (Mujahid, Diez Roux, Morenoff, and Raghunathan 2007). First, an objective measurement of a neighborhood can be obtained with the use of geographic databases, in which the number of playgrounds, businesses, or the crime rates per neighborhood

is included. These data provide objective indicators for the characteristics of a neighborhood, but such data are not always available for every neighborhood. Furthermore, data on characteristics of neighborhoods are not all equally reliable. For example, data on the frequency of criminal activity may be biased: the police keeps track of the number of reported robberies, instead of the actual number of robberies, whereby the former depends (among other things) on the willingness of victims reporting.

A second method to determine characteristics of neighborhoods is the so-called 'systematic social observation', whereby trained observers assess specific indicators of neighborhoods (Raudenbush and Sampson 1999; Sampson and Raudenbush 1999). This method allows the direct measurement of neighborhood characteristics which are not included in the geographic databases. Furthermore, the use of (multiple) objective observers protects the reliability of the data. Yet, because of the time and the cost intensiveness, this observation method is not always feasible. Another disadvantage of the systematic social observation method is that some neighborhood characteristics are difficult to measure by observation, such as social cohesion or mutual trust between residents.

A third way to measure characteristics of a neighborhood is with the use of questionnaires in which residents are asked about their opinion on their neighborhood. The use of existing large data files (e.g., the Dutch dataset 'WoonBehoeft Onderzoek'), in which a relatively large group of residents is interviewed, makes this solution efficient and relatively inexpensive. Consequently, even characteristics which could be measured with the use of observation methods, such as a neighborhood's physical disorder (e.g., graffiti) are often measured by asking neighborhood residents about their opinions, and then aggregating these opinions to form one neighborhood measure. This use of residents' perceptions to determine neighborhood characteristics, however, introduces a new difficulty: residents base their opinion not only on the actual situation in the neighborhood, but their perceptions are probably also shaped by personal characteristics of the resident.

### **4.3 Two methods of aggregating respondents' opinions**

In 2007, the Dutch government defined a list of forty neighborhoods which experience the most severe problems (in Dutch: 'probleemwijken'), and which are therefore eligible for extra governmental support. The list of the forty most disadvantaged neighborhoods in the Netherlands is built on data generated with the third way of measuring neighborhoods characteristics: with the use of questionnaires. The selection of these forty neighborhoods has been discussed extensively (see, e.g., Gent, Musterd, and Ostendorf 2007b). One of the topics of discussion is whether the correct criteria have been used to select the neighborhoods. In this paper I do not criticize such selection criteria, but investigate the method by which residents' opinions are aggregated to form one neighborhood 'score'. If this method of aggregation affects the 'ranking' of a neighborhood, then even with the 'right' selection criteria some neighborhoods may have inadvertently been selected as most disadvantaged and therefore receive governmental support, even though other neighborhoods are more in need of such support.

### 4.3.1 The ‘traditional’ method of aggregating respondents’ opinions

The selection of the forty neighborhoods is based on four dimensions: socioeconomic disadvantage, physical state of the neighborhood, social problems, and physical problems (Gent, Musterd, and Ostendorf 2007a; 2007b). Each dimension consists of several indicators which are compared to the national average score of the indicator. Because the indicators are measured on different scales, z-scores are first calculated per indicator. Subsequently, the mean is taken of all indicators per dimension. Lastly, the mean of the four dimensions results in a final neighborhood score.

The dimensions ‘socioeconomic disadvantage’ and ‘physical state of the neighborhood’ consist of multiple indicators of factual information. For example, these indicators reflect the income of residents or the presence of old buildings. The dimensions ‘social problems’ and ‘physical problems’ consist of several indicators of the residents’ opinions on their neighborhood, e.g., feelings of insecurity and the degree of pollution.

Because this paper is concerned with aggregating the opinions of survey respondents to one neighborhood score, I will focus on the ‘physical problems’ and ‘social problems’ in the remainder of this paper. In summary, the ‘traditional’ method aggregation is as follows. First, neighborhood residents are asked how often a number of problems occur in their neighborhood (e.g., loitering, litter, graffiti, etc.). Second, one ‘respondent score’ is created by taking the mean of these ten problems per respondent. Third, the ‘neighborhood score’ is constructed by taking the mean of all of the ‘respondent scores’ within the same neighborhood.

### 4.3.3 The ‘ecometrics’ method of aggregation

Raudenbush and Sampson (1999) argue that the ‘traditional’ method of aggregation neglects several important things. They propose an alternative, ‘ecometrics’ method of aggregation, which improves upon the ‘traditional’ method in four different ways. First of all, the ‘ecometrics’ method takes the frequency of occurrence of each indicator into account. Many neighborhoods have some street litter, but public physical abuse occurs in only few neighborhoods. Thus, public physical abuse is an indicator that better differentiates neighborhoods than the degree of litter, and this should be reflected in the overall score of a neighborhood.<sup>46</sup>

Second, the method proposed by Raudenbush and Sampson (1999) takes into account the number of respondents that give their opinion on the neighborhood. An aggregation of respondents’ opinions is more reliable when a larger number of respondents judge the neighborhood. Since existing databases often contain a different number of respondents per neighborhood, it is necessary to explicitly take this into account when constructing the neighborhood score.

<sup>46</sup> The number of indicators also matters. An aggregation based on ten indicators of problems is more reliable than an aggregation based on two indicators. The number of indicators should therefore be reflected in the reliability of the neighborhood score. If every resident in every neighborhood gives his or her opinion on the same number of indicators—which is often the case when using standardized large-scale surveys—this criticism is less important.

Third, a neighborhood score becomes more reliable when the residents are in higher agreement with each other. A neighborhood where some residents believe their neighborhood is safe and clean while others believe the neighborhood is unsafe and dirty, can receive the same score as a neighborhood where all respondents believe that the neighborhood is reasonably safe and reasonable dirty. However, the reliability of the score of this latter neighborhood is much higher than the former.

Fourth and most important, the ‘ecometrics’ method of aggregation filters out differences of opinion between residents which are the result of personal characteristics instead of the actual level of problems of neighborhood. When, for example, the elderly people in a neighborhood experience more feelings of insecurity than the younger people in that neighborhood –and there are overall more elderly people in that neighborhood– then this will lead to a biased neighborhood score when one simply takes the mean of all respondents. The neighborhood is not actually unsafe, but many people who live in that neighborhood have certain personal characteristics that cause them to feel unsafe.

The ‘ecometrics’ method is based on a multilevel model with three levels (Hox 2002; Snijders and Bosker 1999): indicators  $i$  nested within individuals  $j$  nested within neighborhoods  $k$ . If the indicators reflecting the occurrence of problems are coded as binary variables (0 = absent, 1 = present), this produces the following model:

$$Y_{ijk} \mid \mu_{ijk} \sim \text{Bernoulli}; E(Y_{ijk} \mid \mu_{ijk}) = \mu_{ijk}$$

$$\text{Var}(Y_{ijk} \mid \mu_{ijk}) = \mu_{ijk}(1 - \mu_{ijk}); \eta_{ijk} = \log\left(\frac{\mu_{ijk}}{1 - \mu_{ijk}}\right)$$

$$\eta_{ijk} = \sum_{m=1}^{10} \alpha_m D_{mijk} + \sum_{q=1}^r \delta_{qk} X_{qjk} + u_{jk} + v_k$$

This model estimates indicators, individual differences between residents, and neighborhood differences at the same time. Whether respondents have indicated that the neighborhood experiences problems depends on the specific indicator  $i$  and on the personal characteristics of the residents. The various indicators of problems are modeled by ten dummy variables  $D_{mijk}$ ,  $m=1, \dots, 10$ . The ‘item difficulty’ (i.e., how often the specific type of disorder  $i$  occurs in a neighborhood) is indicated by  $\alpha_m$ . By controlling for  $q$  number of personal characteristics,  $X_{qjk}$ , the composition differences between neighborhoods are accounted for.<sup>47</sup>

The final overall neighborhood score is reflected in  $v_k$ . A negative score of  $v_k$  shows that neighborhood  $k$  has a lower score than the average neighborhood (i.e., has fewer problems), while a positive  $v_k$  indicates that neighborhood  $k$  has a higher score than the average neighborhood (i.e., has more problems).

47 The predictors could also be allowed to vary across neighborhoods (i.e., random slopes model). Here, they are held constant for the sake of understanding.

#### 4.4 Data

To illustrate the application of the ‘ecometrics’ model, and compare this model to a ‘traditional’ model which takes the mean of all indicators and respondents, I use the Police Population Monitor 2005 (PPM, Dutch: PolitieMonitor Bevolking).<sup>48</sup> In this survey, a total of 52,560 respondents were interviewed all over the Netherlands. Similar to the definition used to select the forty most disadvantaged Dutch neighborhoods, I used 4-digit postal codes to define neighborhoods. Within the national sample, I selected only those respondents living in Amsterdam ( $N = 5,052$  respondents in 71 neighborhoods). Using more cities and neighborhoods is not necessary for the illustration of the methods, and would make the figures in this paper difficult to understand.<sup>49</sup>

The PPM consists of several questions regarding personal characteristics, neighborhood problems, whether people feel unsafe, victimization, and contacts between police and citizens. Since the forty most disadvantaged neighborhoods were selected based on indicators from the dataset WBO/WoON 2002/2006 (Gent, Musterd, and Ostendorf 2007b) which was not available to me at the time of writing, I selected ten indicators from the PPM that correspond to these indicators as much as possible. Five indicators reflect physical disorder and five indicators reflect social disorder, and are presented in table 4.1.

Table 4.1 Indicators of physical disorder and social disorder

Do these forms of disorder / crime occur in your neighborhood?
Litter on the street
Dog feces on the street
Vandalism of phone booths, bus or tram stops
Nuisance from loud noise (other than from traffic)
Graffiti on walls and/or buildings
Intoxicated people on the street
People getting bothered on the street
Threatening behavior
Violent behavior
Drugs

Source: Police Population Monitor 2005.

All ten indicators are measured on an ordinal scale indicating whether this form of disorder occurs ‘often’, ‘sometimes’, or ‘(almost) never’ in the neighborhood. To keep the illustration of the new method as simple as possible, all the indicators are recoded into a binary variable: the response categories ‘often’ and ‘sometimes’ were combined into ‘present’ (1), while the response category ‘almost never’ was ad-

<sup>48</sup> This dataset was also used in chapter 3 of this dissertation.

<sup>49</sup> There were also other practical reasons for this selection. First, this chapter was written as a contribution to the “Geografie Stadsdag 2008”, held in Amsterdam and attended by researchers and (Amsterdam) policy makers alike. Second, ‘ecometric’ analyses with the complete PPM dataset took very long to estimate due to insufficient computing power.

justed to ‘absent’ (0). To illustrate the working of the ‘ecometrics’ method, I include several personal characteristics of the respondents. These characteristics are: age, gender, ethnic background, and whether the respondent is employed.

## 4.5 Results

### 4.5.1 Intra-neighborhood correlation

The intra-neighborhood correlation coefficient (*ICC*) indicates how large the contribution of the neighborhood is to the total variance in the perception of disorder. The *ICC* may adopt any number between 0 and 1, with a higher number indicating that the respondents (i.e., residents) within the same neighborhood have more similar opinions. The *ICC* is calculated by dividing the variance between neighborhoods by the total variance (Sampson and Raudenbush 1999).

Just over 16 percent of the total variance appears to be found between neighborhoods. This is comparable to research performed in neighborhoods in Chicago (Sampson, Raudenbush, and Earls 1997) in which residents were asked to what extent they trusted each other and shared norms about appropriate behavior.

### 4.5.2 Reliability of a neighborhood score

The *reliability* of a neighborhood score ( $v_k$ ) is affected by the *ICC* as well as the number of respondents in each neighborhood and the number of indicators of disorder (Hox 2002). This reliability, like the *ICC*, can attain any number between 0 and 1 and is high when the differences between neighborhoods are high and/or the number of people per neighborhood is large:

$$\lambda_k = \frac{\omega}{\omega + \frac{\tau}{J_k} + \frac{\sigma}{nJ_k}}$$

Here,  $\omega$  is the variance at neighborhood level,  $\tau$  the variance between individuals within the neighborhood, and  $\sigma$  the variance between the indicators. There are several methods to estimate the item variance (Snijders and Bosker 1999, p. 219). For simplicity, I assume the logistic model to be a threshold model (Snijders and Bosker 1999, p. 223), where the level-1 variance is defined as  $\pi^2/3$ . Finally,  $J_k$  refers to the number of people  $J$  in neighborhood  $k$ , and  $n$  is the number of indicators.

The reliability of the neighborhood scores in our data ranges from approximately 0.13 to 0.98. In two neighborhoods, just one respondent was responsible for the neighborhood score, resulting in the low reliability of 0.13. The high reliability of 0.98 is achieved in one neighborhood with nearly 400 respondents. The average reliability is around 0.92, based on an average number of respondents per neighborhood of 71.

Figure 4.1 shows how the reliability scale behaves according to the number of respondents per neighborhood. The solid line refers to the relationship implied by the empirical results. With 15 respondents per neighborhood, a reliability of 0.70 is

achieved, while with 25 respondents the reliability increases to nearly 0.80. After that, the marginal returns for reliability quickly decrease per additional respondent. In short, to obtain reliable scores on a neighborhood, about 25 respondents are sufficient and the costs of additional respondents are unlikely to outweigh the gains. These results are very similar to neighborhood research in Chicago (Sampson, Raudenbush, and Earls 1997).<sup>50</sup>

If all other values would remain equal, the use of twenty instead of ten disorder indicators provides limited gain (dashed line), while a doubling of agreement between people in the same neighborhood does lead to quick improvements in reliability (dotted line). If residents would have fewer disagreements about the extent of neighborhood disorder (e.g., an *ICC* of 25%) even a number of 15 respondents would suffice to produce a reliable neighborhood score.

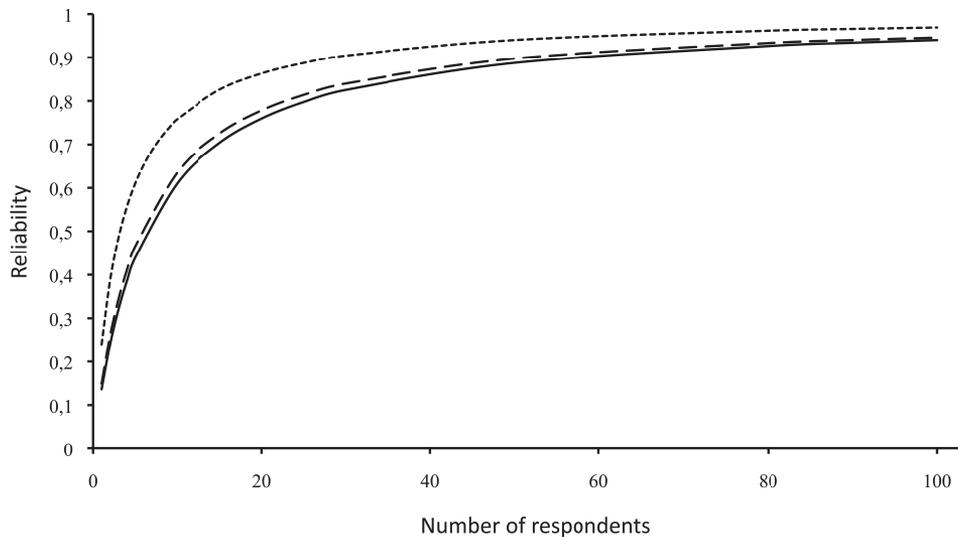


Figure 4.1 Reliability of neighborhood score with respect to the number of respondents

### 4.5.3 Disorder indicators and personal characteristics

The parameter estimates of the ten disorder indicators in table 4.2 indicate how often each type of disorder occurs in Amsterdam neighborhoods. The smaller the coefficient, the rarer this type of disorder occurs in the neighborhoods. Litter and dog feces are relatively common, while threatening behavior is rare. This also seems to correspond to an intuitive order of severity, although the indicator ‘violent behavior’ seems placed rather high on the list (i.e., occurs more often than, for example, people getting bothered on the street). Although the size of the coefficients varies, the total range of the coefficients (from -1.656 to 1.458) is smaller than in research in Chicago neighborhoods (Sampson and Raudenbush 1999).

<sup>50</sup> According to this finding, 55 out of the 71 examined neighborhoods in Amsterdam have an unnecessary high number of respondents, while in other neighborhoods too few respondents were interviewed.

Table 4.2 Parameter estimates of disorder indicators

Indicator	Par.	S.E.
Litter on the street	1.458	0.076***
Dog feces on the street	1.451	0.076***
Graffiti on walls and/or buildings	0.515	0.074***
Intoxicated people on the street	-0.452	0.074***
Nuisance from loud noise (other than from traffic)	-0.477	0.074***
Vandalism of phone booths, bus or tram stops	-0.648	0.074***
Violent behavior	-0.689	0.074***
Drugs	-0.890	0.074***
People getting bothered on the street	-1.035	0.075***
Threatening behavior	-1.656	0.076***

\*\*\*  $p < .001$  (two-tailed tests). Source: Police Population Monitor 2005.

Finally, table 4.3 summarizes how certain personal characteristics, which are all centered on their average for the whole sample, influence a person's opinion on the neighborhood. The negative coefficient of age indicates that each year a respondent is older than the average age (50 years in these data), the respondent is less likely to report neighborhood disorder. In addition, employed people report more disorder compared to unemployed respondents and women are more inclined to report disorder than men. Non-Dutch natives report less disorder in the neighborhood than the native residents in the same neighborhood.

Table 4.3 Parameter estimates of personal characteristics

Indicator	Par.	S.E.
Litter on the street	1.458	0.076***
Dog feces on the street	1.451	0.076***
Graffiti on walls and/or buildings	0.515	0.074***
Intoxicated people on the street	-0.452	0.074***
Nuisance from loud noise (other than from traffic)	-0.477	0.074***
Vandalism of phone booths, bus or tram stops	-0.648	0.074***
Violent behavior	-0.689	0.074***
Drugs	-0.890	0.074***
People getting bothered on the street	-1.035	0.075***
Threatening behavior	-1.656	0.076***

\*\*\*  $p < .001$ . Source: Police Population Monitor 2005.

#### 4.5.4 The 'econometrics' method versus the 'traditional' method

In chapter 2 and chapter 3 of this dissertation, the neighborhood-level variables constructed with the 'econometrics' method correlated highly with variables created by the 'traditional' method. In the subsequent regression analyses in which these

variables are used as predictors, the substantive results were similar. Based on these results, it seems the more sophisticated method of aggregation is not strictly necessary.<sup>51</sup> This raises the question: to what extent do the two methods of aggregation actually lead to different neighborhood scores?

To answer this question, I first took the  $v_k$  of each neighborhood (the score generated by ‘ecometrics’) as well as the score generated by the ‘traditional’ method (i.e., the mean of all indicators within each respondent, and subsequently the mean of all respondents in the same neighborhood). All neighborhoods were ranked: the neighborhood with the least disorder received ranking place number one, the next neighborhood number two, and so on. If two neighborhoods have the exact same score, they receive the same place on the ranking list. A summary of how the traditional method differs from the ‘ecometrics’ method with regard to the placement on the ranking list is provided in table 4.4.

Table 4.4 Changes in ranking of neighborhoods in Amsterdam (‘ecometrics’ versus ‘traditional’ method)

Ranking difference	N	Perc.
>5 increase	11	15.5%
1-5 increase	28	39.4%
no change	4	5.6%
1-5 decrease	19	26.8%
>5 decrease	9	12.7%
Total	71	100%

Source: Police Population Monitor 2005.

Only 4 of the 71 neighborhoods (5.6%) receive the same place on the ranking list when comparing the two aggregation methods. Approximately 28% of all neighborhoods shift more than five places up or down on the ranking list, while 66% of the neighborhoods shift between one and five places. The method by which different disorder indicators answered by neighborhood residents are aggregated to the neighborhood level has clearly affects the ranking of neighborhoods.

Table 4.4 gives a general overview of the shifts in the ranking list, but does not clarify which specific neighborhoods have shifted most in the ranking list. It is possible that the difference between the two methods is stronger for certain neighborhoods. Figure 4.2 shows more precisely how each of the 71 neighborhoods is ranked by both methods of aggregation, so that the ranking of individual neighborhoods can be compared. Generally, the rankings produced by the two methods of aggregation appear quite similar. If a neighborhood scores poorly by taking the mean of all indicators and respondents per neighborhood, then that neighborhood also scores quite low according to the ‘ecometrics’ method. A closer inspection, however, reveals quite a few differences. The two methods often rank “average”

51 Note: in these chapters the number of respondents per neighborhood was rather large. Perhaps significant differences would be found between the ‘ecometrics’ method and the ‘traditional’ method when fewer respondents per neighborhood had been available.

neighborhoods, that is, neighborhoods which do not experience much disorder but are also not the cleanest or safest neighborhood, quite differently. Next, I focus on the ‘best’ (neighborhood 1-10) and ‘worst’ neighborhoods (neighborhood 60-71) produced by both methods, since these are the neighborhoods most often referred to in public discussions.

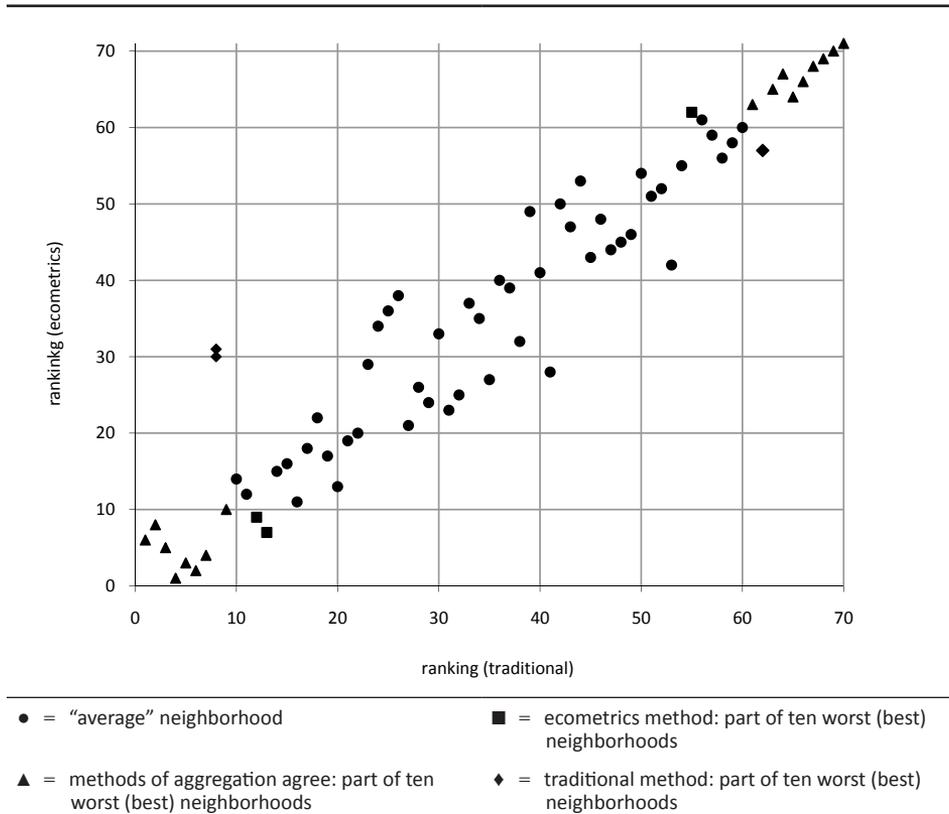


Figure 4.2 Ranking of neighborhoods in Amsterdam: ‘ecometrics’ versus ‘traditional’ method

The neighborhoods with the least disorder (i.e., low ranking) and most disorder (i.e., high ranking) are indicated by triangles, squares or diamonds in figure 4.2. Triangles indicate that *both* methods of aggregation indicate that these neighborhoods are in the top ten of ‘best’ and ‘worst’ neighborhoods. Squares indicate that the ‘ecometrics’ method finds these neighborhoods to have the least (or most) disorder, but the ‘traditional’ method does not. Diamonds indicate that the ‘traditional’ method finds these neighborhoods to have the least (or most) disorder, but the ‘ecometrics’ method does not.

With regard to the neighborhoods with least disorder, the ‘best’ neighborhoods of Amsterdam, two neighborhoods immediately stand out: whereas the ‘traditional’ method of aggregation finds that these neighborhoods share ranking number 8, the ‘ecometrics’ score actually places these neighborhoods on ranking number 30 and

31 (i.e., slightly better than average neighborhoods). The ‘ecometrics’ method ranks the neighborhoods indicated by squares as belonging to the ten ‘best’ neighborhood (namely, ranking number 7 and 9), whereas the ‘traditional’ method ranks these neighborhoods as number 12 and 14.

Because governmental policy usually focus on neighborhoods with the most disorder –these are neighborhoods in need of support– a comparison of the two methods of aggregation is especially important for these neighborhoods. By using the ‘traditional’ method of aggregation, the neighborhood indicated by the diamond is considered to be the number 8 ‘worst’ Amsterdam neighborhood. This neighborhood is no longer considered to be part of the ten ‘worst’ neighborhoods by using the ‘ecometrics’ method. Instead, the ‘ecometrics’ method calls attention to the two neighborhoods indicated by squares.

In practice, a government may have a specific amount of financial aid available, which policy dictates should be divided over a certain number of neighborhoods. If the ‘ten worst’ neighborhoods will each receive one-tenth of such governmental support, and if these ten neighborhoods are selected based on the ‘traditional’ method, then the neighborhoods indicated by diamonds receive support which should actually have gone to the neighborhoods denoted by squares. Based on these data, one neighborhood would wrongly receive this support at the expense of another neighborhood. Note, however, that the more sophisticated ‘ecometrics’ method finds that four other neighborhoods experience more disorder than the (diamond) neighborhood which would receive governmental support. In summary, this means that the ‘traditional’ method endorses governmental support for one neighborhood, when in fact five other neighborhoods are more in need of such support when using a more sophisticated method of selection.

#### 4.5.5 Uncertainty of neighborhood scores

Using the ‘ecometrics’ method to achieve a more objective neighborhood score is of course still based on the *aggregated opinions* of a number of respondents. The best estimates of the neighborhood scores were used in figure 4.2, but the ‘true’ neighborhood score could actually be somewhat different: the estimate has a certain margin of error. To illustrate this, figure 4.3 shows the neighborhood scores of all 71 neighborhoods according to the ‘ecometrics’ method ( $v_k$ ), with error bars drawn around the neighborhood scores.

Figure 4.3 assumes a 5% significance level, so that the standard error around the estimate of the neighborhood score is multiplied by 1.39 (Goldstein and Healy 1995). If the error bars around two scores overlap, the neighborhoods cannot be distinguished at the 5% significance level. This shows that the neighborhood with the highest level of disorder (number 71) can significantly be distinguished from the next neighborhood (number 70). However, many of the other ‘worst’ neighborhoods cannot be significantly distinguished from each other, especially those neighborhoods which have less disorder than the ‘worst three’. According to these results, governmental policy which grants aid to, e.g., exactly ten neighborhoods seems especially unfair because many other neighborhoods cannot be reliably distinguished from these ten neighborhoods.

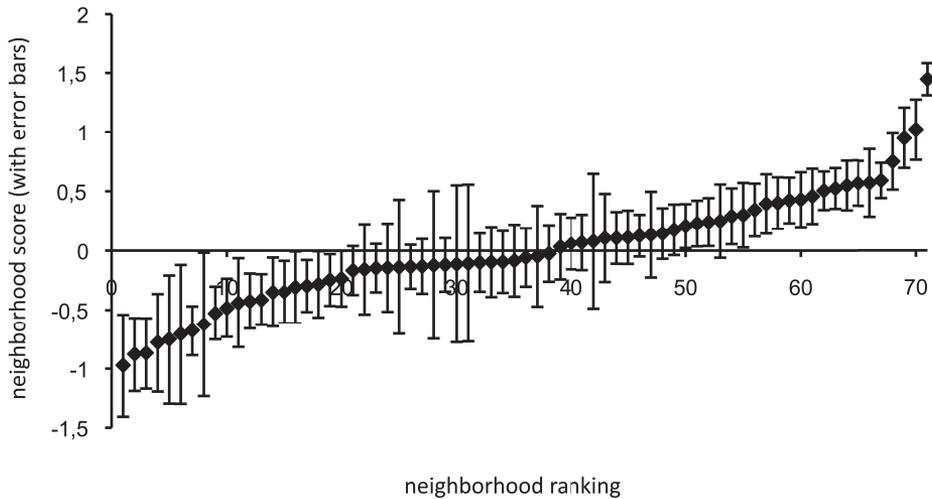


Figure 4.3 Neighborhood score per neighborhood, with error bars ('ecometrics' method)

## 4.6 Conclusion

This paper described two methods of aggregating respondents' opinions to one neighborhood 'score'. The 'traditional' method averages the opinions of one respondent about a number of neighborhood problems to a 'respondent score', and then averages the scores of all respondents in the same neighborhood. The 'ecometrics' method makes substantive improvements on this traditional method by taking into account, among other things, the number of respondents and demographic characteristics affecting the opinion of respondents.

Previous studies have often tried to capture neighborhood characteristics because these characteristics are used in subsequent analyses, e.g., to determine the effect of social cohesion on crime rates. However, in our own analyses (i.e., in chapter 2 and chapter 3), no substantive differences were found when using either the 'traditional' method of aggregation or the 'ecometrics' method. The present study explicitly compares the two methods. This comparison shows that there *are* differences between the two methods when a *ranking* of neighborhoods is made. The differences are not large, but if grant money is distributed among a fixed number of neighborhoods and the neighborhoods are selected based on the 'traditional' method, some neighborhoods are left without support while such a subsidy is actually justified according to the more sophisticated 'ecometrics' method. In short, only giving aid to the "worst" neighborhoods seems ill-advised.

However, even with the new 'ecometrics' method, the selection of neighborhoods remains delicate, because the neighborhood scores are based on the opinions of residents and therefore there is always some uncertainty as to what the 'true'

neighborhood score is. Taking this uncertainty into account, it appears that the neighborhood scores partly overlap each other: with the ten indicators of disorder used in this study, and limiting ourselves to Amsterdam neighborhoods, many neighborhoods cannot be significantly distinguished from the 'worst' neighborhoods.

#### 4.7 Discussion

A number of decisions have been made to simplify the comparison of aggregation methods; here, I discuss such decisions. First of all, it is assumed that a postal code area reflects a respondent's 'neighborhood'. Since the respondents were not asked to indicate what area they denote as their neighborhood, this assumption may be unreasonable. Some of the residents may indeed have meant the relatively large postal code area, while other respondents may have referred to a just few streets. Second, the indicators of problems were recoded from a three-point scale to a two-point scale to simplify the 'ecometrics' model. The original three-point scale, requiring an ordinal logistic multilevel model, may have resulted in a different estimate of neighborhood scores. Third, the neighborhood scores do not take into account how the physical and social disorder developed over time. This reflects a substantive question, i.e., whether the disorder at a particular time is of interest, or the history of the disorder in that neighborhood. If a neighborhood has a history of minor disorder but currently experiences many problems, should the government intervene (i.e., should the neighborhood score be adjusted accordingly)? Fourth, in this study the ten indicators of disorder were assumed to form one scale, even though the indicators might reflect two types of disorder: physical disorder and social disorder. Modeling these two types of disorder at the same time (in the same 'ecometrics' model) is possible, and also provides information on the correlation between the two types of disorder at the neighborhood level.



# Chapter 5

## NEIGHBORHOOD PROBLEMS AS A PUBLIC GOOD DILEMMA

THE EFFECT OF PERCEIVED COLLECTIVE EFFICACY  
ON INDIVIDUAL SOCIAL CONTROL



This paper was co-authored by Beate Völker and Henk Flap.

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# Neighborhood problems as a public good dilemma

## 5.1 Introduction

Empirical research consistently shows that neighborhoods with greater population turnover, lower socioeconomic status, and more ethnic heterogeneity experience more problems (e.g., physical and social disorder) than other neighborhoods.<sup>52</sup> A meta-analysis by Pratt and Cullen (2005) shows that social disorganization theory receives strong empirical support with regard to its explanations of macro-level crime rates. The theory can be summarized as follows. Neighborhoods with poor housing attract people who cannot afford live somewhere else, and therefore residents are not committed to the neighborhood in the first place. When people get better jobs they tend to move out, which makes it hard to maintain social ties between neighbors. Ethnic heterogeneity, moreover, impedes communication between neighborhood members of different backgrounds. The lack of social cohesion and the difficulties in communication thwarts the emergence of norms about appropriate behavior and norms about intervention in local disorder (Bursik and Grasmick 1993).

In short, the mechanism which links the structural neighborhood characteristics—low socioeconomic status, high population turnover, and high ethnic heterogeneity—to neighborhood problems is low social cohesion resulting in little social control (Bursik and Grasmick 1993). Sampson and colleagues reformulated this mechanism into *collective efficacy*, or the *capacity for collective action of a group* on behalf of the public good (Sampson, Raudenbush, and Earls 1997), referring to a macro-level version of the notion of self-efficacy (Bandura 1977; see also Bandura 2000). Combining social cohesion, mutual trust, and shared expectations of social control into one concept, Sampson et al. (1997) showed that collective efficacy largely mediates the relationship between the structural neighborhood characteristics and crime rates. Not so much the structural neighborhood characteristics, but the differential collective capacity for action by the neighborhood residents determines whether public order is maintained.

On the one hand, the reformulation of social control into collective efficacy stimulated much neighborhood research and also provided a test of Bandura's collective efficacy theory in the realm of neighborhood problems. On the other hand, it reinforced scholars to focus most of their attention on neighborhood-level

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52 Disorder refers to the physical or social conditions in a neighborhood that are considered troublesome and potentially threatening (Perkins and Taylor 1996; Taylor 1999). Whereas social disorder refers to undesirable behaviors such as panhandling and loitering, physical disorder refers to the consequences of such behavior on the physical environment, such as vandalism.

explanations as well as organized collective action. This focus disregards both the choice situation of an individual actor, namely whether to actually take action on behalf of the public good or not, and non-organized action by individual residents.<sup>53</sup> Addressing these issues, this paper focuses on the *unorganized* choices of *individual residents*: should one intervene in a disorderly situation in the neighborhood or not, i.e., take action on behalf of a collective good? We thus investigate the individual-level mechanisms of the neighborhood-level theory of social disorganization.

Because social disorganization theory itself does not provide clear individual-level predictions, we use an existing game-theoretical model to analyze the choice situation faced by residents. A number of game-theoretical papers argue that situations such as witnessing an accident or a crime (Diekmann 1985; Weesie 1994), cleaning and painting a community center, or sanctioning smokers in non-smoking areas (Weesie and Franzen 1998) can be considered a 'volunteer's dilemma'. In such social conflict situations, someone needs to volunteer to address the problem but even though it is in the interest of everyone to volunteer, everyone prefers to let someone else volunteer.<sup>54</sup> This leads to our main research question: *what is the relationship between an individual's expectations that others are willing to exercise social control and the individual's own willingness to exercise social control in disorderly neighborhood situations?*

The remainder of this paper is structured as follows. We first more extensively discuss the notion of collective efficacy and argue why it is important to investigate individual-level actions next to neighborhood-level explanations. Then, we describe the situations investigated in this study and note that these situations have been modeled as a volunteer's dilemma in previous game-theoretical and experimental studies. Based on the volunteer's dilemma, we derive hypotheses with regard to the willingness of an individual to take action to remedy problematic neighborhood situation, i.e., act on behalf of the public good. The results section empirically tests the hypotheses using a survey among residents in 161 Dutch neighborhoods. The conclusion and discussion summarize the main findings and discuss this study's limitations and directions for further research.

## 5.2 Theory

### 5.2.1 Collective efficacy, and the need for individual-level explanations

As described in the introduction, social disorganization theory states that certain neighborhood characteristics affect social cohesion and mutual trust, which in turn affect the neighborhood-level informal social control, which affects the level

53 Interestingly, although collective efficacy is explicitly formulated as a neighborhood-level concept, Sampson et al. (1997) also refer to actions by individual when they state: "Indeed, one is unlikely to intervene in a neighborhood context in which the rules are unclear and people mistrust or fear one another" (Sampson, Raudenbush, and Earls 1997, p. 919).

54 The volunteer's dilemma is one example of a public good dilemma, and hinges upon the assumption that one volunteer is sufficient to provide the public good. Although we can think of public good dilemma's where one volunteer is insufficient to provide the public good, the theoretical papers argue that one volunteer is a valid assumption for the situations described here.

of neighborhood-level deviance (e.g., physical and social disorder). Sampson et al. (1997) combined social cohesion, mutual trust and social control into one concept: 'collective efficacy'. Their notion of collective efficacy is a macro-level version of Bandura's self-efficacy theory, in which it is argued that the belief in one's capabilities has a large impact on the decision to engage in certain behavior (Bandura 1977; 1982). Similarly, people's shared beliefs in their collective capability are argued to be crucial to achieve desired group-level outcomes. Collective efficacy is then the perception of individual group members *about the capability the group has* to perform certain actions, which incorporates the "coordinative and integrative aspects operating within groups", and is preferable when outcomes are only achievable by "adept teamwork" (Bandura 2000, p. 76). Still rooted in the notion of perceived self-efficacy, collective efficacy is also an emergent group-level attribute because it transcends the individuals which make up the group (Bandura 2000). "Perceived collective efficacy will influence what people choose to do *as a group*, how much effort they put into it, and their staying power when group efforts fail to produce results" (Bandura 1982, p. 143, italics by the authors) .

Such neighborhood-level explanations of neighborhood problems, however, disregard that social control is often exercised by *individual* residents who act *independently* of each other. First, *neighborhood-level explanations* forego that ultimately individual residents need to make decisions. Even if all social control would be collectively organized by a group, individual residents would have to decide whether or not to join such a group, take part in actions that the group organizes, etc. It is important to realize that a safe and clean neighborhood, or in other words, a neighborhood with social and physical order, is a public good. A public good is non-rivalrous, i.e., the 'consumption' of such a good does not reduce its availability or diminish its worth for others. It is also non-exclusive, in that no one can be effectively excluded from 'using' the good. In this case, every individual finds himself in a public good dilemma: a situation where it is profitable to *not* participate in the neighborhood community, because the actions of that community (e.g., cleaning the street, reprimanding deviants) will benefit him anyway and he will not have to bear any costs himself (e.g., spending time cleaning the street which could have been spend on other worthwhile activities).<sup>55</sup> It is, in other words, rational to 'free-ride' on the actions of others.

Second, a focus on *organized collective action* disregards that social control can also be the result of interdependent but unorganized actions of many individuals. Indeed, we argue that in addition to coordinated actions by a group of residents, such unorganized actions of the individuals are also –and perhaps even more so– an aspect of neighborhood life. If a resident sees loitering youths, he can speak up and send them on their way. If he sees graffiti on a wall, he can clean the wall or ignore it. In many cases, there is *no organized collective* action to combat these problems, requiring adept teamwork of neighborhood residents. It may be that a few residents decide upon the same action and all of a sudden there is a group of residents reprimanding the loitering youths, but this is a far cry from the coordinated collective

<sup>55</sup> For reasons of brevity, we refer to an actor in the male form (i.e., 'he'). In every such instance, we actually mean all individuals, male or female.

group action implied by collective efficacy.<sup>56</sup> Note that a public good dilemma also crops up in a situation with uncoordinated individual actions. When a problematic situation is small enough that one resident could solve it, he argues “why should I alone bear the costs for intervention (e.g., time, fear of bodily harm), when everyone else benefits from my action?” And when a problematic situation is too large for one person to solve alone, there is a public good dilemma to determine how many and which neighborhood residents will take action.

Figure 5.1 summarizes the neighborhood-level explanations of neighborhood problems, as well as the proposed individual-level mechanism. On the neighborhood-level, social disorganization theory states that (a) neighborhood characteristics (i.e., population turnover, ethnic heterogeneity, socioeconomic status) affect the level of collective efficacy (and in turn collective efficacy affects the level of neighborhood disorder). On the individual-level, we expect that (b) individual characteristics affect the willingness that an individual takes action to improve neighborhood disorder, e.g., intervene in a disorderly situation. More importantly, such (c) individual willingness of taking action is also affected by the individual’s perception of collective efficacy. In this study we will investigate to what extent there are separate effects of *perceived social cohesion and trust*, as well as one’s *expectations about the intervention behavior of others*, on one’s willingness to intervene. Lastly, there might be residual direct effects of (d) neighborhood characteristics on an individual’s willingness to intervene.

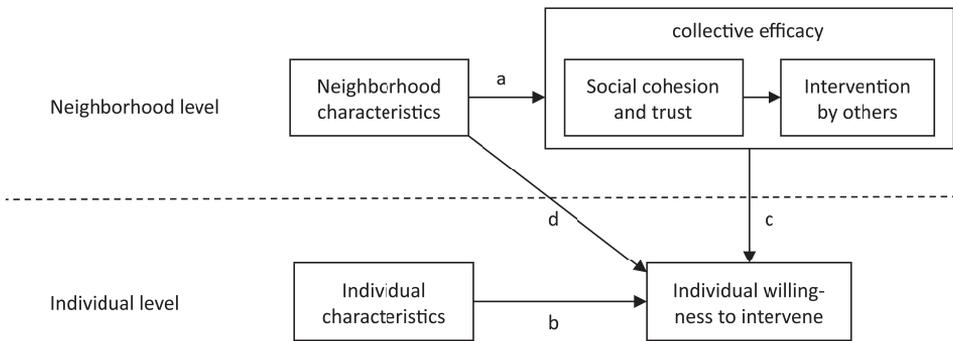


Figure 5.1 Social disorganization theory (neighborhood level), and relationships investigated in this study (individual level)

We readily admit that this study is not the first to explicitly focus on the action of residents on behalf of a public good in the neighborhood, given the (in)action of other residents. After Gansberg (1964) described the (in)actions of residents in the murder of Kitty Genovese in an article in the New York Times, many studies have investigated the effect of group size on an individual’s willingness to act (e.g., Darley

56 An individualistic approach to collective efficacy is also described by Bandura himself, which he views as the sum of the perceived self-efficacy of the group members. In this alternative approach to collective efficacy, “members may inspire, motivate, and support each other, but the group outcome is the sum of attainments produced individually rather than by the members working together” (Bandura 2000, p. 76-77).

and Latané 1968). These studies often entail lab experiments or theoretical modeling of the situation after changing the underlying assumptions (e.g., Diekmann 1985). This is not the approach taken in this study. In contrast, we asked neighborhood residents to estimate the likelihood that others will take action in several different neighborhood problems as well as their own willingness to take action to address the problem. We use the existing game-theoretical models of the ‘volunteer’s dilemma’ to provide (counter-intuitive) predictions about the effect of others’ actions on the actions of an individual, and test to what extent these predictions hold empirically. In this way we take game theory out of the lab and investigate its predictions in practical neighborhood situations.

### 5.2.2 Neighborhood problems as a volunteer’s dilemma

In this study, we investigate the actions of individuals, as affected by their expectations of the actions of others, with regard to several neighborhood problems: (1) loitering children, (2) loud arguments in public, (3) children fighting on the street, (4) spraying of graffiti, (5) breaking into a home, and (6) breaking into a car. These problems differ in severity, of which the first half may be conceptualized as ‘disorder’ and the second half as ‘crime’.<sup>57</sup>

In game-theoretical models, authors have previously proposed that these situations can be considered as a “volunteer’s dilemma”.<sup>58</sup> Diekmann (1985) provided the first analysis of this type of problem, and used the murder of Kitty Genovese as an example. Even though many people witnessed the crime, nobody came to help or even phoned the police. Diekmann shows that, even when people are in principle willing to take some action of small cost, like calling the police, and would also like to see the victim receive support, this does not always lead to at least one person volunteering. Based on these authors’ arguments, the volunteer’s dilemma and its extensions are the prevailing theoretical models for the kind of situations discussed in the present study.

The volunteer’s dilemma model does not apply when the costs of action are greater than the potential benefits. For example, this would be the case when a resident expects bodily harm when personally intervening. We argue that in our study, the six situations have lower costs than the potential benefits, because we do not investigate which *specific* action an individual will take, but investigate the willingness of an individual to take *any* kind of action. For some problems, respondents may have conceptualized ‘action’ in terms of talking to the culprit, whereas for other problems, respondents may have thought about ‘calling the police’. We considered *any* action as valid volunteering behavior, and therefore, costs can be considered lower than the potential benefits of solving the situation.<sup>59</sup>

<sup>57</sup> Specifically, the indicators of disorder reflect ‘social disorder’, but we will refer to these situations as ‘disorder’ in the remainder of this study.

<sup>58</sup> Rasmusen (2007, p. 81-84) also discusses the volunteer’s dilemma and argues that the case of Kitty Genovese can be considered as such, but he calls it “the civic duty game”.

<sup>59</sup> Such an assumption is also made by Diekmann (1985) and other studies of the volunteer’s dilemma model. For example, Weesie (1993, p. 569) introduces an extension of the model and specifically writes: “Given a helper’s risk of being hurt oneself, it is not surprising that people were reluctant to step in. The

Next, we describe the volunteer’s dilemma model in more detail. The model is a simplified version of reality in that it describes binary decisions. A resident has two distinct and mutually exclusive behavioral alternatives, namely ‘intervene’ and ‘not intervene’. Intervention, as we already discussed, can refer to any behavior which leads to a reduction of inappropriate, disorderly behavior. Individuals evaluate the payoff of their behavioral alternatives given their expectations about what others will do. Moreover, we assume that actors are rational: they aim to maximize their (perceived) utility. In other words, people only take action when they expect a gain from doing so (given their goals and preferences, and their perception of the situation), and they perform the action which brings them greatest gain. Lastly, we assume that actors have similar cost-benefit ratios, although we will later relax this assumption to asymmetry of costs and benefits.

### 5.2.3 The volunteer’s dilemma

In the original version of the volunteer’s dilemma, it is assumed that only one volunteer is needed to produce the public good (Diekmann 1985). More formally, every actor  $i$  can produce the public good with cost  $c_i > 0$ , and then obtain the benefit  $b_i$ . The same benefit is also obtained by the other actors, i.e.,  $b_i = b_j$ , where  $j$  indicates any actor who did not perform the action. There are no selective benefits for actors who volunteer or for those who do not volunteer. We assume  $b_i > c_i > 0$ , so that for any volunteer the benefits of volunteering exceed its costs. With  $N > 1$  actors who have a shared interest in the public good, an actor has the following behavioral alternatives: ‘action’ and ‘inaction’. Based on the previously discussed assumptions, the utility of each alternative is: (1)  $b_i - c_i$  if actor  $i$  takes action; (2)  $b_j$  if actor  $i$  does not take action but at least one other actor  $j$  takes action; (3) 0, if actor  $i$  and all other actors do not take action. This situation is depicted in figure 5.2, where we have replaced ‘volunteer’ by ‘intervene’, because the actor can decide to intervene in a problematic situation.

		Number of others taking action	
		0	1 or more
Choice of focal actor	Intervene	$b - c$	$b - c$
	Not intervene	0	$b$

Figure 5.2 Volunteer’s dilemma payoffs for focal actor

What is the outcome of this situation? The outcome for resident  $i$  clearly depends on the behavior of the other actors, so there is no one best strategy of  $i$  (i.e., either always act or always not act) which is *independent* of what others do –and this also holds for the other actors. Such a strategy would be a *dominant* strategy (Rasmusen

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fact that people seemed unwilling to apply the minimal resources to phone the police ...” It seems that previous theoretical studies assume that respondents have at least one low-cost behavioral alternative, i.e., calling the police. In our study, we captured this assumption by not specifying the specific action to be undertaken, but accepting *any* action by the respondent as valid volunteering behavior.

2007, p. 20), but it is absent in this situation because if none of the others intervenes, the focal actor prefers to intervene; and the focal actor prefers not to intervene if at least one of the others intervenes.

There are two types of solutions to the volunteer's dilemma. First, there is a *pure strategy Nash equilibrium*. A 'pure strategy' refers to the set of behavioral alternatives an actor has (i.e., 'intervene' or 'not intervene'). A 'Nash equilibrium' refers to the situation in which no actor has an incentive to deviate from his strategy given that the other actors do not deviate (Rasmusen 2007, p. 26). There are  $N$  pure strategy Nash equilibria in Diekmann's volunteer's dilemma, namely every combination of choices in which exactly *one* resident intervenes. In practical terms: if a resident thinks that others will intervene, he prefers to leave it up to others to do so because he will not bear potential costs  $c$  (e.g., time, a strained relationship with the deviant other, or bodily harm), but will share the same benefits  $b$  (i.e., a clean neighborhood). Alternatively, if a resident thinks that others will not intervene, he prefers to intervene himself, since he can still produce the public good and receive utility  $b_i - c_i > 0$ .

The second solution to the volunteer's dilemma is a *mixed strategy Nash equilibrium*. The mixed strategy Nash equilibrium does not prescribe a deterministic choice of the actors, but prescribes that actors intervene with a probability  $p$  and not intervene with probability  $1-p$ . Thus, a 'mixed strategy' assigns probabilities to each behavioral alternative and actors randomly intervene according to these probabilities (Rasmusen 2007, p. 69). The equilibrium is found when others intervene with some probability, such that the remaining actor  $i$  is indifferent between 'intervene' and 'not intervene'. In other words, the equilibrium is found when each actor's expected payoff to action is equal to his expected payoff to inaction. Diekmann (1985) shows that for the discussed volunteer's dilemma there is a mixed strategy Nash equilibrium in which every actor intervenes with probability  $1 - (c/b)^{1/(N-1)}$ . With this probability (by all actors), no actor can improve his expected utility by unilaterally changing his strategy.

Both the pure and the mixed strategy equilibria result in the same hypothesis for the present study. The pure strategy equilibrium implies that the best strategy is for every actor to *not intervene* when he believes others will intervene, and to *intervene* when he believes others will not intervene. The mixed equilibrium expression implies that if a resident believes that others intervene with a larger probability than the  $p$  prescribed by the mixed equilibrium, the focal resident will not intervene, and vice versa. Therefore, the higher a resident's expectation that others will intervene, the larger the probability that this estimate is above the value of the mixed equilibrium, and the less likely this resident takes action himself. We formulate the hypothesis: *the more a resident expects others will take action, the less a resident himself is willing to take action* (H1).<sup>60</sup>

In addition, the mixed equilibrium implies that the probability of intervention increases with the cost-benefit ratio of the public good. We argue that the benefits of solving criminal situations ( $b_{crime}$ ) are greater than the benefits for disorderly

60 Such a resident 'free-rides': he shoulders less than a 'fair' share of the costs of the provision of the public good.

situations ( $b_{disorder}$ ), because crime has a larger impact on the neighborhood than disorder. Or, in other words, *not* intervening in a crime causes more potential costs for the neighborhood than not intervening in physical or social disorder. Due to the way the questions in our study were phrased, we argue that costs are similar ( $c_{crime} = c_{disorder}$ ), or at least that the costs of social control do not rise proportionally to the rising benefits:  $c_{crime} / b_{crime} < c_{disorder} / b_{disorder}$ . This leads to hypothesis 2: *a resident is more willing to take action to counter crime than disorder* (H2).

#### 5.2.4 Individual characteristics affecting the willingness to intervene

Diekmann's (1985) model of the volunteer's dilemma assumes that there are no selective benefits, or benefits from volunteering other than the benefit provided by the public good. This may not be a realistic assumption. For example, some actors may be (impurely) altruistic and also receive a "warm glow" of volunteering (Andreoni 1989; 1990). Alternatively, an actor who often volunteers may derive extra individual benefits from their reputation or status in the neighborhood. Moreover, homeowners arguably receive higher (potential) benefits from a clean and safe neighborhood than home renters, because they can sell their house at a profit in such neighborhoods. In other words, actors may have 'asymmetry' in their cost-benefit ratio.<sup>61</sup>

Diekmann (1993) generalized the original volunteer's dilemma by introducing asymmetric costs and benefits.<sup>62</sup> Now,  $c_i / b_i$  does not equal  $c_j / b_j$ . For example, this is the case when –for constant costs– one actor receives not only the benefit that other players receive ( $b_j$ ) but also a selective benefit ( $b_s$ ), so that  $b_i = b_j + b_s$ . The mixed strategy equilibrium is found when every actor takes action with probability

$$1 - \frac{b_i}{c_i} \left( \prod_{j=1}^N \frac{c_j}{b_j} \right)^{1/(N-1)}$$

Diekmann (1993) shows that the mixed strategy equilibrium counter-intuitively predicts that actors with *lower (higher) costs (benefits)* to provide the public good are *less likely* to volunteer. He argues that instead of the mixed equilibrium, Schelling's concept of a 'focal equilibrium' may be much more realistic in this situation (see also Franzen 1999): when there is a clear strong player, the focal solution is that he volunteers and all others free-ride. This latter prediction is also supported by Diekmann's experimental data. This leads to the general hypothesis that the higher the benefits or the lower the costs are for a resident, the more willing he is to take action.

61 Whereas hypothesis 2 is based on the argument that disorderly *situations* differ in their benefits while costs of intervention do not proportionally increase (and therefore,  $c/b_{crime} < c/b_{disorder}$ ), here it is argued that  $c/b$  may differ per actor.

62 One might argue that an actor only receives selective benefits from altruism or status when none or very few others also volunteer: when very many others also volunteer, the uniqueness of his volunteering is no longer recognized (i.e., he doesn't receive a warm glow, or he doesn't receive a special reputation and associated status). In other words, the selective benefit may decrease with the number of volunteers. However, we ignore this possibility in the remainder of this study.

In this paper, we assume that *homeownership*, *having no plans to move* out of the neighborhood, and *membership of a neighborhood association* are indicators of low cost-benefit ratios of a resident. A homeowner can probably some day sell his house at a profit if the neighborhood has not deteriorated, i.e., potentially receive more benefit than people who rent their home. When someone has concrete plans to move house, it would be irrational to volunteer on behalf of the public good of a neighborhood which he is going to leave soon: there are no more (potential) future benefits to be had of his action. Lastly, being a member of a neighborhood association indicates vested interests in the neighborhood other than homeownership and plans to stay living there. We view this as a general indicator of commitment to the neighborhood. We formulate the hypothesis as follows: *a resident who is (a) a homeowner, (b) does not have plans to move house out of the neighborhood, and (c) is a member of a neighborhood association, is more willing to take action than other residents* (H3).

### 5.3 Data and methods

#### 5.3.1 The Survey of the Social Networks of the Dutch

To test our hypotheses, we use data from the second wave of the *Survey of the Social Networks of the Dutch* (referred to as SSND2, see Völker, Flap, and Mollenhorst 2007) and a small additional wave of the same survey which was conducted to have at least five respondents per neighborhood.

The first wave of the SSND was conducted in 1999/2000 and contains information on 1,007 individuals in the Netherlands. A stratified random sample was drawn from 40 Dutch municipalities, representing various provinces and regions, while taking urbanization and the number of residents into account. In each of the municipalities, four neighborhoods were randomly selected using the postal code system. Per neighborhood, 25 addresses were randomly selected. At eight of these addresses, the resident between 18 and 65 years of age –who would have his or her birthday first– was interviewed. The resulting dataset of 1,007 respondents in 161 neighborhoods is representative for the Dutch population between 18 and 65 years of age (overall response rate = 40%).

In 2007 and 2008, as many of the original 1,007 respondents as possible were re-interviewed in the second wave of the SSND. Over 70 percent of the 850 respondents whose (new) addresses could be retrieved were willing to be re-interviewed, which resulted in a new dataset of 604 respondents. Because 103 respondents no longer lived in the original 161 neighborhoods, the SSND2 dataset which we use in this study contains 501 respondents. The question ‘Would you take action if you see or hear that ... is happening in your neighborhood?’, which is the dependent variable of this study, was asked for the first time in the SSND2. Therefore we do not use the first wave of the SSND in this study.

Because some respondents declined to cooperate or had moved out of the original 161 neighborhoods, some of our neighborhoods were now ‘empty’: there was no longer any respondent living in these areas. To remedy this, an additional wave

was conducted in 2008 to have at least 5 respondents in each of the 161 neighborhoods. The additional survey provided 394 new respondents. Together with the SSND2 this resulted in 895 respondents nested in 161 Dutch neighborhoods. Six neighborhoods have 4 respondents, and all other neighborhoods have 5 or more respondents, with a maximum of 9 respondents per neighborhood.

### 5.3.2 Measurements

#### Dependent variables

The respondents received the following examples of situations which might occur in their neighborhood: (1) (truant) children loitering; (2) children arguing and fighting; (3) people having a loud argument; (4) adolescents spraying graffiti on a wall; (5) someone breaking into a house; and (6) someone is fiddling with / breaking into someone's car.

For each of these situations, the respondents were asked whether they would take any action if they heard or saw one of the following situations happen in their neighborhood, with the following answer categories: 'definitely not'; 'probably not'; 'maybe, maybe not'; 'probably'; and 'definitely'. We categorized the six situations into two categories by taking the mean. We call situations 1-3 *disorder*, since these are situations which may be troublesome and potentially threatening, but do not represent criminal acts (Cronbach's alpha = .73). We consider situations 4-6 to be *crime*, because these acts are prohibited by law and also more harmful than the disorderly acts (Cronbach's alpha = .72).<sup>63</sup>

#### Independent variables

The respondents were also asked about their belief that other people from the neighborhood would take action in these six situations. This reflects one half of perceived 'collective efficacy', i.e., the expectations about the willingness to intervene by neighborhood residents (Sampson, Raudenbush, and Earls 1997). Mirroring the two categories of the dependent variables, we constructed the categories of *expectation of action by others* as 'disorder' (Cronbach's alpha = .64) and 'crime' (Cronbach's alpha = .74).<sup>64</sup>

In addition, we have several variables that capture individual characteristics which may influence one's actions on behalf of the public good: a dummy variable indicating *homeownership*; a dummy variable indicating whether the respondent

63 The results of the explanatory analyses are comparable to analyses in which we use (non-orthogonal) factor scores of these variables. However, taking the mean of the variables facilitates interpretation of results, and we therefore decided to use this categorization (by taking the mean of the variables) in this study.

64 In the survey the respondents were presented with the first situation (i.e., loitering children), and then asked whether they expected that other people from the neighborhood would take action. This was repeated for the other five situations. After giving their response to these questions, the respondents were presented with the first situation again, but then asked if they themselves would take action (i.e., the dependent variable). This was repeated for the other five situations. In these latter questions we did not ask about one's willingness to intervene conditionally on the actions of others. Instead, the question was: "Would you yourself intervene ..."

seriously considers *moving out* of the neighborhood; and a dummy variable indicating whether the respondent is a *member of a neighborhood association*.

We also investigate whether there is a separate effect of the other half of ‘collective efficacy’, i.e., perceived social cohesion and trust. Sampson et al. (1997, p. 919) argue that “one is unlikely to intervene in a neighborhood context in which the rules are unclear and people mistrust or fear one another”. We measured this perceived social cohesion and trust as the mean between two items: ‘people in this neighborhood have good contact with each other’ and ‘people in this neighborhood trust each other’ with five answer categories: ‘totally disagree’, ‘disagree’, ‘not disagree, but also do not agree’, ‘agree’, and ‘totally agree’.

Moreover, we controlled for two neighborhood characteristics, because these might have an effect on one’s willingness to intervene independent of social cohesion and one’s expectations of the actions by others. The respondents were asked about their agreement with the statement ‘there is a lot of turnover in this neighborhood; a lot of people move away’, which corresponds to *perceived population turnover*. In addition, the respondent’s agreement with the statement ‘a lot of people from different ethnic backgrounds live in this neighborhood’ was used to capture *perceived ethnic heterogeneity*. We used these personal perceptions of population turnover and ethnic heterogeneity instead of the actual neighborhood statistics because an individual’s perception of the neighborhood characteristics is arguably what influences his or her behavior.<sup>65</sup>

### 5.3.3 Multivariate multilevel analysis

The explanatory analyses of this study consist of multivariate multilevel analyses, that is, multilevel analyses wherein the two dependent variables are simultaneously included in the model. We investigate the relationship between (1) the individual characteristics of the respondent, (2) the perceptions of population turnover, ethnic heterogeneity, and cohesion and trust among residents, (3) the individual perceptions of the actions of others, and the willingness of an individual resident to exercise social control in two different situations, namely disorder and crime. In all models we control for the following (personal) characteristics of the respondent: age (both linear and non-linear effects), sex, ethnic background (coded as a dummy variable: 0= born in the Netherlands, 1=elsewhere), level of education, and monthly income.<sup>66</sup>

65 Unfortunately, we do not have a measure of socioeconomic status in the present study, but we believe that this is not problematic for the analyses in this paper. The theoretical model of social disorganization argues that poverty is the reason people move out of the neighborhood and ethnically heterogeneous groups move in. Population turnover and ethnic heterogeneity are arguably the most important variables for our analyses, because these characteristics are hypothesized to cause the actual changes in social cohesion and social control.

66 Income was originally coded in 17 different categories, and education in 9 different categories. A test for non-nested model fit using Akaike Information Criterion (AIC) showed that the best fitting model assumed an interval scale instead of an ordinal scale. The AIC equals  $l+2p$ , where  $p$  is the number of parameters in the model,  $l$  is the deviance or  $-2 * \log$  likelihood statistic, and the model with the smallest AIC fits best (Rasbash, Charlton, Browne, Healy, and Cameron 2009; Rasbash, Steele, Browne, and Goldstein 2009).

## 5.4 Results

### 5.4.1 Descriptive statistics

Table 5.1 shows the mean and standard deviations of the key variables. The two dependent variables as well as the 'expected action by others' independent variables were recoded so that -2 refers to 'totally disagree' and +2 refers to 'totally agree'. So, a negative sign responds to a respondent saying it is unlikely he will take action or he perceives it is unlikely that others would take action. A positive sign responds to a positive reaction to these questions, that is, a positive willingness and expected likelihood of action.

Table 5.1 Descriptive statistics of key variables

	Mean	St. dev.
<i>Would you take action ... (-2 to +2)</i>		
Disorder	0.30	1.08
Crime	1.64	0.51
<i>Do you expect others to take action ... (-2 to +2)</i>		
Disorder	0.41	0.91
Crime	1.52	0.55
<i>Perceived neighborhood characteristics (0-4)</i>		
Cohesion and trust	2.61	0.68
Population turnover	1.50	1.07
Ethnic heterogeneity	1.15	1.05
<i>Individual characteristics (0-1)</i>		
Homeowner	0.69	
Wants to move	0.13	
Member of neighborhood association	0.16	

Source: SSND2 and additional survey (161 neighborhoods, 895 respondents).

Respondents are generally willing to intervene in problematic situations (the mean of both disorder and crime is greater than zero), albeit with a different likelihood for each type of situation. On average, respondents are more likely to intervene in situations of clear criminal activities than in disorderly situations (1.64 > .30). Respondents also expect it to be more likely that others from the neighborhood intervene in criminal activities (mean = 1.52) than that they intervene in less troublesome, disorderly activities (mean = .41).<sup>67</sup>

On a scale of 0 to 4, respondents were asked about their perception of cohesion and trust, population turnover, and ethnic heterogeneity. Descriptive statistics show that the respondents generally perceive their neighborhood to be cohesive and mutually trusting (mean = 2.61). On average the respondents do not agree that there

<sup>67</sup> The respondents' answers for (both own willingness and expectation of) 'disorder' intervention ranges from -2 to +2. In contrast, the respondents' answers for own (and expectation of) 'crime' intervention ranges from about -.5 to +2. In other words, almost none of the respondents stated that they or others would abstain from intervening in 'crime' situations.

is a lot of turnover or ethnic heterogeneity in their neighborhood, although there is quite a bit of variation between respondents (the standard deviation is 1.07 and 1.05, respectively).

Finally, 69% of the respondents in this study are home owners. About 13% of respondents want to move house, and about 16% are a member of a neighborhood association.

#### 5.4.2 Explanatory analyses

A random-intercept multilevel model without any explanatory variables estimates the distribution of the variance between the individual-level and the neighborhood-level (results not shown in the tables). About 10% of the total variation of 'disorder' intervention lies between neighborhoods. For intervention in 'crime', this intra-class correlation is 9.7%. This shows that while two respondents within the same neighborhood are somewhat more alike in their answers on the dependent variables than two randomly selected respondents, about 90% of the variance can be found between *individuals* instead of neighborhoods.

Table 5.2 shows the first three models for the two dependent variables.<sup>68</sup> In Model 1, we find that all three individual-level predictors affect an individual's willingness to take action to remedy disorder and crime according to expectations. Homeowners are more likely to take action than residents who rent their home ( $B = .302$  for disorder and  $B = .119$  for criminal situations). If a resident has intentions to move house, he is less willing to intervene on behalf of the public good (disorder:  $B = -.243$ ; crime:  $B = -.127$ ). Being a member of a neighborhood association is related to a higher willingness to take action ( $B = .265$  and  $B = .093$ ).

Adding *population turnover* and *ethnic heterogeneity* produced Model 2. The results of the individual characteristics are quite similar to the previous model. In contrast to Model 1, having intentions to move house is somewhat less significantly related to willingness to take action in disorderly situations, and homeownership is no longer significantly related to willingness to intervene in crime. Perceived ethnic heterogeneity is significant for both disorder and crime. We find a *negative* relationship with the willingness to take action on behalf of the public good. In other words, residents in more ethnically diverse neighborhoods are less willing to take action on behalf of disorder ( $B = -.108$ ) and crime ( $B = -.092$ ) than residents in ethnically homogeneous neighborhoods. We do not find support for an effect of (perceived) population turnover on an individual's willingness to take action.

Lastly, model 3 shows that when a resident perceives that the people from the neighborhood get along well and people trust each other, he himself is more willing to intervene on behalf of both public goods (disorder:  $B = .271$ ; crime:  $B = .149$ ). Model 3 also shows that, controlling for perceived social cohesion and trust, individual characteristics no longer affect one's willingness to take action in criminal situations. For disorderly situations, we still find support that homeowners ( $B = .183$ ) and members of a neighborhood association ( $B = .235$ ) are more willing to

<sup>68</sup> The number of respondents in these analyses is 698 instead of 895 because of missing data, largely in the variable reflecting a respondent's income. Additional analyses—with the original ordinal income variable and a separate category for missing values—did not show differences in the results of our models.

Table 5.2 Parameter estimates of key variables explaining an individual's intention to take action to counter disorder and crime

	Model 1		Model 2		Model 3	
	B	S.E.	B	S.E.	B	S.E.
Disorder						
Intercept	0.240	0.097*	0.285	0.098**	0.310	0.096**
<i>Individual characteristics</i>						
Homeowner	0.302	0.089***	0.221	0.092*	0.183	0.091*
Wants to move	-0.243	0.113*	-0.214	0.113+	-0.154	0.112
Member of neighborhood association	0.265	0.105*	0.261	0.105*	0.235	0.103*
<i>Perceived neighborhood characteristics</i>						
Population turnover			-0.041	0.038	0.003	0.039
Ethnic heterogeneity			-0.108	0.042*	-0.073	0.042+
Cohesion and trust					0.271	0.060***
Neighborhood-level variance	0.064	0.033+	0.054	0.032+	0.043	0.030
Individual-level variance	0.936	0.057***	0.931	0.056***	0.913	0.055***
Crime						
Intercept	1.623	0.049***	1.656	0.049***	1.670	0.048***
<i>Individual characteristics</i>						
Homeowner	0.119	0.045**	0.062	0.046	0.040	0.045
Wants to move	-0.127	0.056*	-0.114	0.056*	-0.080	0.055
Member of neighborhood association	0.093	0.052+	0.095	0.052+	0.081	0.051
<i>Perceived neighborhood characteristics</i>						
Population turnover			-0.002	0.019	0.022	0.019
Ethnic heterogeneity			-0.092	0.021***	-0.074	0.021***
Cohesion and trust					0.149	0.030***
Neighborhood-level variance	0.020	0.009*	0.016	0.008*	0.013	0.008
Individual-level variance	0.224	0.014***	0.220	0.013***	0.214	0.013***
Covariance at neighborhood-level	0.008	0.013	0.003	0.012	-0.002	0.011
Covariance at individual-level	0.164	0.021***	0.159	0.021***	0.148	0.020***
Deviance	2843.8		2820.1		2786.8	
N neighborhoods	161		161		161	
N respondents	698		698		698	

Source: SSND2 and additional survey (also controlling for other age, sex, ethnic background, education, and income). \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; +  $p < .1$  (two-tailed tests).

take action than home renters and non-members.

Table 5.2 also shows that the neighborhood-level variance for both disorder and crime is no longer significant when we introduce 'cohesion and trust' as a predictor. In other words, we are able to explain differences between individuals' willingness to take action to remedy crime and disorder by introducing individual-level characteristics and individual perceptions of neighborhood-level attributes.

Table 5.3 Parameter estimates of individual and perceived neighborhood characteristics, as well as the respondent's expectation of the actions of others, explaining an individual's intention to take action to counter disorder and crime

	Disorder		Crime	
	B	S.E.	B	S.E.
Intercept	0.027	0.078	1.019	0.062***
<i>Individual characteristics</i>				
Homeowner	0.076	0.073	0.018	0.039
Wants to move	-0.093	0.090	-0.011	0.049
Member of nbhd association	0.183	0.083*	0.056	0.043
<i>Perceived nbhd characteristics</i>				
Population turnover	0.000	0.031	0.015	0.017
Ethnic heterogeneity	-0.043	0.034	-0.047	0.018**
Cohesion and trust	0.034	0.050	0.046	0.027+
Expect others to intervene	0.704	0.035***	0.431	0.031***
Neighborhood-level variance	0.038	0.020+	0.003	0.005
Individual-level variance	0.572	0.035***	0.163	0.010***
Covariance at neighborhood-level		-0.007	0.007	
Covariance at individual-level		0.092	0.014***	
Deviance		2254.0		
N neighborhoods		161		
N respondents		698		

Source: SSND2 and additional survey (also controlling for other age, sex, ethnic background, education, and income). \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; +  $p < .1$  (two-tailed tests).

Table 5.3 shows the final model for both dependent variables. In one instance we find support for Hypothesis 3, that the stronger the incentives for a resident, the more willing he is to take action. This is the case for Hypothesis 3c for disorderly situations: a member of a neighborhood association ( $B = .183$ ) is more willing to take action than a non-member. For all other indicators of an individual's cost-benefit ratio, we do not find significant estimates. With respect to (perceived) neighborhood characteristics, we find a significant effect of 'ethnic heterogeneity' and 'cohesion and trust' for criminal activities. A respondent living in a neighborhood which he perceives to be ethnically heterogeneous is less likely to take action to remedy

crime ( $B = -.047$ ). When a resident perceives the neighborhood has more cohesion and trust, he is more willing to take action to remedy criminal situations ( $B = .046$ ).

The intercept of the model gives an indication of the willingness to intervene in disorder and crime when controlling for other explanations (i.e., individual attributes, individual’s perception of the neighborhood, and the expected willingness to intervene by others). On a scale of -2 to +2, the intercept shows that respondents are more willing to intervene in crime than in disorderly situations, thereby finding support for Hypothesis 2.

For both disorder and crime, there is a strong and positive relationship between the expectations of the actions by others and one’s own willingness to take action (Disorder:  $B = .704$ ; Crime:  $B = .431$ ).<sup>69</sup> An individual’s expectation about the action of others from the neighborhood is clearly a strong predictor for his own willingness to intervene on behalf of the public good. The model also improves greatly: the deviance drops from 2,786.8 to 2,254.0 with two new predictors. Obviously, these results are the opposite of Hypothesis 1, namely that residents are *more* willing to intervene if they think that others will *also* intervene. We will interpret these findings more fully and provide several explanations in the discussion.

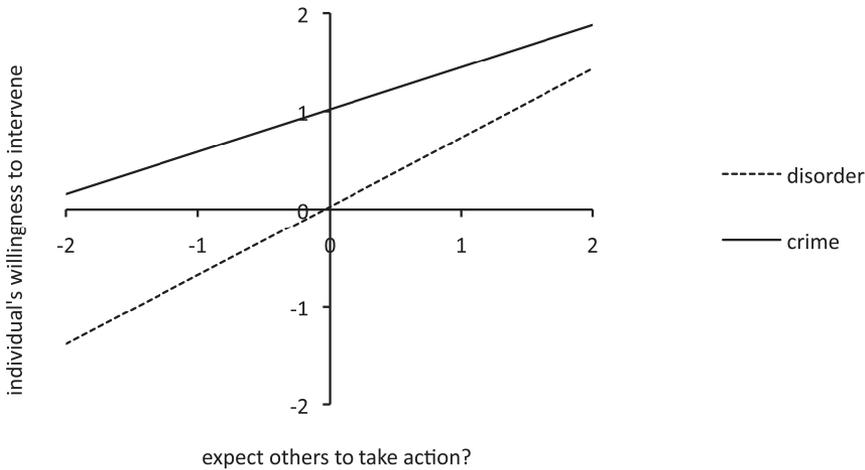


Figure 5.3 Summary of results: an individual’s willingness to intervene in disorder and crime in relation to the expected actions by others (-2 = definitely not; -1 = probably not; 0 = maybe, maybe not; 1 = probably; 2 = definitely)

We also find differences between disorder and crime, which are most easily discussed using figure 5.3, which shows the effects of the expected actions of others (x-axis) on an individual’s willingness to take action himself (y-axis). The solid line shows that for criminal activities, a resident is willing to take action even when he does not expect that others would take action to remedy the situation: the solid line is always above the x-axis.

<sup>69</sup> We also explored nonlinear effects of the actions of others on an individual’s willingness to intervene, but we did not find support for such effects.

The dashed line indicating disorder shows that the willingness to take action roughly matches the expected actions of others. When a resident perceives that others would not take action, he is less willing to take action himself. And when a resident perceives that others would take action, he is more willing to take action himself. More precisely, when an individual expects others not to take action, an individual's willingness to take action is somewhat greater than what he expects others will do: (when expected actions by others  $< 0$ ) the line for disorder lies above the diagonal. In contrast, when an individual expects others to take action (expected actions by others  $> 0$ ) an individual's willingness to take action is smaller than what he expects others will do: the line for disorder lies below the diagonal for these values of expected actions by others.

## 5.5 Conclusion

Social disorganization theory argues that certain neighborhood characteristics lead to more social cohesion and mutual trust, which in turn leads to more neighborhood-level informal social control, i.e., social control exercised by neighborhood residents, which leads to less disorder in the neighborhood (see figure 5.1). Social disorganization theory is a *neighborhood-level* theory, and is unclear about the individual-level mechanisms underlying its explanations. There seems to be an implicit assumption in social disorganization theory that in neighborhoods in which residents share expectations that others will intervene in disorderly situations, an individual resident is also more willing to intervene in a specific situation. More generally, social disorganization theory does not specify the conditions under which individual residents are more or less likely to exercise social control.

The aim of this study was to investigate one such individual-level mechanism, i.e., the relationship between an individual's expectation that *others are willing* to exercise social control and the *individual's own willingness* to exercise social control in disorderly neighborhood situations. We have used game theory to derive hypotheses with regard to the social control behavior of individual residents. Starting with Diekmann (1985), game theoretical models of the 'volunteer's dilemma' have been proposed to explain this situation. These models of volunteering on behalf of the public good, e.g., calling the police in the case of Kitty Genovese, predict that when actors expect others to intervene, they prefer *not* to intervene as well.

Our first hypothesis (H1) was that the more a resident expects others will take action, the less a resident himself is willing to take action. This hypothesis is rejected by our data. Instead, we found that the more a respondent expects others to intervene, the more willing he is to intervene himself. This relationship is independent of the specific situation, although the strength of the relationship varies between disorderly situations and more serious, criminal situations.<sup>70</sup>

We also formulated the hypothesis (H2) that a resident is more willing to take action to counter more serious problems than less serious problems, which in our

<sup>70</sup> An additional analysis showed that this conclusion also holds for each of the six separate situations (of which we had defined three as 'disorder' and three as 'crime' and analyze jointly in the analyses in this paper).

study was reflected in composite measures of ‘criminal’ situations (i.e., breaking into houses; fiddling with/breaking into cars; spraying graffiti) and ‘disorderly’ situations (i.e., children loitering; children arguing and fighting; people having a loud argument on the street). This hypothesis is supported by our empirical findings.

The third hypothesis concerned how individual characteristics of a resident affect one’s willingness to intervene. Our general hypothesis stated that the higher the benefits or the lower the costs are for a resident, the more willing he is to take action. If we do not take perceptions of cohesion and mutual trust or the expectations of others’ actions into account, our empirical findings are in support of hypothesis 3. Being a homeowner, having no plans to move out, and being a member of a neighborhood association is related to higher individual willingness to take action. However, after introducing social cohesion and trust in Model 3 (see table 5.2) and especially an individual’s expectations about the actions of other neighborhood residents in the final model (see table 5.3), we no longer find support for expectations on the effects of most of these characteristics. Only being a membership of a neighborhood association is related to higher willingness to take action to remedy criminal situations.

In summary, our empirical findings show the following. First, although social disorganization theory is unclear about the link from macro to micro, this does not pose a direct problem. Higher (lower) neighborhood-level social control exercised by other neighborhood residents is matched by higher (lower) individual-level willingness to exercise social control. However, our findings do suggest a refinement: for more serious problems, individuals are *more* willing to exercise social control independent of the actions of others. Our results show that even if residents expect that others will not take action to remedy criminal situations, they are willing to take such action. Thus, to counter serious problems, relatively low neighborhood levels of social control need not be detrimental, provided that individual residents observe the criminal act. Second, we find only marginal support that perceived social cohesion and mutual trust affect an individual’s willingness to intervene on behalf of the public good. To be sure, perceived social cohesion and trust seem to affect one’s willingness to intervene, but we only find strong support for this effect when we do not take into account what the individual thinks that others will do. Not so much the perception of social cohesion and trust is what matters for individual action, but one’s expectations about the behavior of others. These results suggest that combining these concepts into one measure of ‘collective efficacy’ confounds the issue instead of clarifying it.

## 5.6 Discussion

The paper aimed to investigate the macro-micro link of social disorganization theory. In this paper, we discussed that game theory already provides ample theoretical modeling as well as experimental findings on the decision situations faced by residents: will a resident take action, i.e., exercise social control, to solve a disorderly situation? Or, more generally: under which conditions are individuals willing to intervene on behalf of the public good? Our theoretical model focused on one

condition, i.e., the behavior of other neighborhood residents, which is not explicitly considered in social disorganization theory.

The empirical results of this study, however, rejected the main prediction of the game theoretical model. The theoretical model predicts that residents will be *less* willing to intervene, i.e., exercise social control, if they expect others to do so. However, we found that residents are *more* willing to exercise social control instead. How can we explain the unexpected empirical findings? We can think of several possible explanations for our findings. For one, the respondents were only asked about their *willingness* to take action to remedy problematic situations, and this might differ from the *actual behavior* when confronted with these situations. Another explanation might be that respondents who themselves are more willing to take action on behalf of the neighborhood also expect that others are more likely to do so. In other words, ‘active’ residents may *think* the rest of the neighbors are ‘active’ as well, independent of what their neighbors *actually* do.

These explanations of our findings aside, we believe that an explanation for our empirical findings should first be sought in the theoretical model of the volunteer’s dilemma itself. First, we discuss several *extensions* of the volunteer’s dilemma based on changing the underlying assumptions to arguably make the model more realistic. Second, we discuss the possibility that the crucial assumption of the volunteer’s dilemma itself, i.e., that one volunteer is enough to attain the public good, is not valid for the situations which neighborhood residents face.

### 5.6.1 Extensions of the original volunteer’s dilemma?

One might argue that the assumptions on which the dilemma hinges –and therefore the volunteer’s dilemma itself and its proposed solutions– are quite unrealistic. In some situations, the benefit of the public good decreases with time: a drowning child needs help and if no one volunteers within a certain time, the “game” itself stops. The original volunteer’s dilemma also assumes that all actors know what the costs and benefits of the other actors are, but this may not be so apparent in real life. Moreover, volunteers may actually be able to share the costs of action with each other, instead of each volunteer having to pay the full cost (i.e., the costs of action are not  $c$ , but  $c / m$ , where  $m$  = the total number of volunteers). Previous studies have analyzed these extensions of the original volunteer’s dilemma, which all derive from the relaxation of the original assumptions (Franzen 1999, p. 136). We will shortly describe these alternative specifications of the volunteer’s dilemma and discuss the implications for our hypotheses.

Weesie (1993) argues that situations in which the benefit of the public good decreases with time, should be described by a volunteer’s *timing* dilemma. The decision in these situations is not whether to take action or not, but whether a resident should take action immediately or wait until someone else does. Weesie (1993, p. 578) gives the example of the rescue of a drowning child: with increasing delay, the likelihood of a favorable outcome decreases. There are  $N$  pure strategy equilibria, namely in which one resident (of the total  $N$  residents) immediately takes action and all others free-ride. The mixed equilibrium strategy is substantively comparable to the original volunteer’s dilemma (Weesie 1993): the probability of volunteering

increases with decreasing cost of intervention, increases with increasing benefits of the public good, and decreases with a larger group. The probability of action is somewhat larger than in the original volunteer's dilemma, although the probabilities converge for large groups.

Another extension of the original volunteer's dilemma involves uncertainty. In contrast to the original volunteer's dilemma, residents may not know each other's costs or benefits. Weesie (1994) describes a model with incomplete information, both for the original volunteer's dilemma and for the volunteer's timing dilemma. It is assumed that actors only know the *distribution* of others' cost-benefit ratios.<sup>71</sup> Weesie (1994) discusses the mixed equilibria for both the original volunteer's dilemma and the volunteer's timing dilemma with uncertainty about costs and benefits, which differ dependent on group size.

Lastly, Weesie and Franzen (1998, p. 601) argue that in some situations it is unreasonable to make the assumption that one volunteer bears the entire burden of providing the public good. "For example, if several bystanders of a crime intervene to protect the victim, the chances that a volunteer is hurt decreases with the number of volunteers. Hence, in such a situation volunteers could effectively share the cost of helping the victim". When we change the assumption so that volunteers can share costs, the outcomes of the model change as well: (1)  $b_i - c/m$ , if actor  $i$  takes action, whereby  $m$  = the total number of volunteers; (2)  $b_i$ , if actor  $i$  does not take action but at least one other actor  $j$  takes action; (3) 0, if actor  $i$  and all other actors do not take action. Although the mixed equilibrium probability of taking action in this cost-sharing model is somewhat more complicated than in the original volunteer's dilemma, the substantive implications are similar.

The main point of this discussion of alternative models of the volunteer's dilemma –based on the relaxation of the underlying assumptions– is that our hypotheses 1 and 2 *do not change*. This is because we have directly measured a resident's expectations of the actions of others. Independent of the specific variant of the volunteer's dilemma, every resident is better off intervening when he thinks others will not intervene, and every resident is better off not intervening when he thinks that others will intervene (H1). In addition, the specific variant of the volunteer's dilemma notwithstanding, every resident is more likely to intervene when the benefits of the public good increase or the costs of action decrease (H2). Thus, the hypotheses which we are able to test in the present study are robust across generalizations of the original model.

## 5.6.2 Can the public good be attained by one actor?

The crucial assumption of the volunteer's dilemma is that one resident is able to solve the problem and still derive positive utility from his volunteering action:  $b_i - c_i > 0$ . How do the predictions of the model change if this assumption is not valid?

71 Although we do not explore this further here, this variant of the volunteer's dilemma also has connections to social disorganization theory. Social disorganization theory argues that residents in neighborhoods of ethnic homogeneity and low population turnover create and maintain strong social ties. Neighbors arguably have less uncertainty about the costs and benefits of other neighbors if they know them well, i.e., have strong social ties.

What if the respondents thought that more than one volunteer was necessary for the production of the public good?<sup>72</sup>

Due to the way we designed the survey, we argued that it is plausible that the respondents viewed the disorderly situations as solvable by one person with relatively small personal cost (i.e.,  $b_i - c_i > 0$ ). However, a resident may still have perceived the six different disorderly and criminal situations as *indicators of a larger underlying problem*. Each particular situation only needs one volunteer, but all the various instances of a neighborhood's "disorder" or "crime" cannot be solved by the same individual resident. One person can clean the street or talk to loitering children, but the same person cannot possibly see all problems that need to be fixed and subsequently fix them.

In other words, the empirical findings may tentatively imply that the prevailing game-theoretical models do not adequately describe the real-life situations with which residents are commonly confronted. An entirely different modeling of the public good dilemma may be more adequate, in which personal costs outweigh benefits but in which a large enough group of people is able to provide the public good under certain assumptions (see Croson 2007, who finds empirical support for reciprocity theories, which assume that actors reciprocate or match the actions of others). Further research, preferably experiments in natural settings, is needed to satisfactorily test the validity of such theoretical models.

<sup>72</sup> Note that it is not necessary whether this is true or not: a resident who believes that other people beside himself are necessary to solve the problem, whether this is true or not, finds himself in a different decision situation than in the original volunteer's dilemma.



## Chapter 6

### 'GUARDIANSHIP' AND 'PLACE MANAGEMENT' BY RESIDENTS AND LOCAL BUSINESS OWNERS



This paper was co-authored by Veronique Schutjens. A slightly different version of this paper is currently under review. The idea for this paper originated from our book chapter in *Bedrijvigheid en leefbaarheid in stedelijke woonwijken* (Raspe, Weterings, Berge, Oort, Marlet, Schutjens, and Steenbeek 2010).

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# 'Guardianship' and 'place management' by residents and local business owners

## 6.1 Introduction

Several studies have investigated the relationship between business presence in residential neighborhoods, or mixed land use, and neighborhood disorder.<sup>73</sup> In the literature, two opposing views can be distinguished. Starting with Jacobs (1961), there is the view that mixed land use can be beneficial for the neighborhood because businesses enhance social cohesion and generate street activity which results in more 'eyes on the street' (i.e., surveillance and social control). More recently, Völker, Flap and Lindenberg (2007) similarly argue that neighborhood facilities (e.g., businesses) provide meeting opportunities: the more such facilities, the greater the chance that people will meet and a community will be created or maintained. A contrasting view acknowledges that businesses are meeting places for people, but argues that they are (also) meeting places where potential offenders easily meet suitable targets, which may result in more neighborhood disorder in the absence of capable controllers (Brantingham and Brantingham 1995). In addition, Taylor (1988) argues that residents feel less responsible in neighborhoods with mixed land use, and therefore are less likely to exercise social control.

Empirically, the second view seems to be supported most with regard to physical and social disorder. Taylor, Koons, Kurtz, Greene and Perkins (1995) find that street blocks with more non-residential land use have more incivilities. Wilcox, Quisenberry, Cabrera and Jones (2004) find a positive relationship between business presence and disorder, but not for the presence of schools. Sampson and Raudenbush (2004) found that bars and liquor stores are related to higher perceived social and physical disorder, which we also found in chapter 3 of this dissertation.

Jacobs explicitly specified local business owners as the neighborhoods 'natural proprietor' (together with residents): "storekeepers and other small businessmen are typically strong proponents of peace and order themselves; they hate broken windows and holdups; they hate having customers made nervous about safety. They are great street watchers and sidewalk guardians if present in sufficient numbers" (1961, p. 37). However, previous studies have often only conceived of businesses as 'offender-target' arenas, neglecting the potential *active* role of the entrepreneurs and their businesses in neighborhood order. Routine activity theory (Cohen and Felson 1979) posits that individual actors –including neighborhood businesses,

<sup>73</sup> Disorder refers to social and physical conditions in a neighborhood that are considered troublesome and potentially threatening (Perkins and Taylor 1996; Taylor 1999). Social disorder refers to undesirable behaviors of others (e.g., loitering, panhandling) and physical disorder refers to the results of such behaviors in the physical environment (e.g., vandalism, graffiti).

business owners, and employees— can be a *target*, as firms are often victim of theft and robbery, and an *offender*, especially when running the business increases litter, noise or traffic congestion and parking pressure in the immediate surroundings of the firm. Moreover, business owners and employees can also be *controllers*, more specifically, ‘place managers’ (Eck and Weisburd 1995), who are responsible for a specific place (e.g., a store or business site) and its immediate surroundings. However, as previous studies on place managers have focused on business employees (see Clarke 1992; Felson 2002) they not only neglect the business owners themselves, but also ignore the fact that most neighborhood firms are small or run by solo entrepreneurs—having no employees whatsoever.

Our central argument is that business owners do play an active role to keep the neighborhood clean and safe, as Jacobs (1961) stated, and that they differ from residents in interest in local order and therefore willingness to intervene. In the empirical part of this paper, we are able to focus on *local business owners*, people who have their own business in close proximity to where they live, who thus combine ‘guardianship’ (as a resident) and ‘place management’ (as a business owner) in the same neighborhood.<sup>74</sup> Consequently, it raises the question whether such local business owners are more willing to take action on behalf of the neighborhood (e.g., by intervening in disorderly behavior), and engage more in activities with their neighbors than other residents. Our central research question is: *are neighborhood entrepreneurs more willing to intervene in problematic (i.e., disorderly and criminal) situations than other neighborhood residents, and are they more likely to engage in (social and social control) activities with their neighbors than other neighborhood residents, and how can we explain this?*

The remainder of this paper is structured as follows. In the theoretical section we first summarize the business-related explanations of neighborhood disorder. Then, we focus on an individual level theory of action with regard to guardianship (Reynald 2009; Reynald 2010) and develop hypotheses whether local business owners are more willing to intervene than residents and are more likely to actually engage in social and social control activities. We empirically test these hypotheses with survey data of 895 residents and 385 local entrepreneurs in 161 Dutch neighborhoods.<sup>75</sup> We end this paper with a conclusion and a discussion.

## 6.2 Theory

In this section, we first give an overview of the literature regarding the effect of neighborhood businesses on the neighborhood’s level of deviance. We have touched upon two opposing views in the introduction of this paper, but thus far a systematic

74 We do not have individual-level data on the actions by *employees*, so these actors will not be the focus of this paper. The net effect of employees (i.e., larger businesses, in terms of employees, attract more customers, but employees can also act as controllers) was investigated in chapter 3 of this dissertation.

75 As we explain in the “Data and methods” section, 895 residents were interviewed in a random selection of 161 Dutch neighborhoods. Local business owners were only found in 145 of these 161 neighborhoods. In our empirical analyses, we use all available data (i.e., 161 neighborhoods); we find similar substantive results when we perform the empirical analyses on the subset residents and local business owners within only the 145 neighborhoods.

overview of theoretical arguments has not been available. In short, the literature has posited *negative* as well as *positive* effects of businesses on their neighborhood. Moreover, it has been argued that these negative and positive business effects are brought about through passive *presence* of local businesses, as well as through *actions* undertaken by the business owners. After this overview, we focus on the purposeful *willingness to intervene* and *revealed actions* by business owners which arguably lead to *positive* outcomes for the neighborhood, i.e., an improvement in social cohesion and a decrease of disorderly situations.

### 6.2.1 Business-related explanations of neighborhood disorder

When summarizing previous studies, we use the key concepts of routine activity theory (Cohen and Felson 1979) because they allow us to systematically organize the research outcomes. Routine activity theory posits that many acts of deviance occur during the routine daily activities of people. In addition, deviance can only occur when a potential *offender* meets a suitable *target* at a certain time and place in the absence of capable *controllers*. Three types of controllers are identified. First, there are handlers, people with whom a potential offender has strong ties or an intimate relationship, like close friends or family members. Second, guardians are other people the potential offender meets and to whom he may be weakly tied: the general public or neighbors. Third, place managers are people who are (professionally) responsible for a specific place, such as a security guard or a store clerk (Eck and Weisburd 1995). From the perspective of routine activity theory, businesses provide the places in which both offenders, targets and controllers come together during their (daily) activities.

- Businesses attract potential offenders. When businesses are present in the neighborhood, potential offenders are more likely to be attracted to the neighborhood, and therefore, business presence has *negative* outcomes for the neighborhood. Some types of businesses are more likely to attract potential offenders than other types of businesses (Brantingham and Brantingham 1995). Firms functioning as 'crime attractors' provide well-known criminal opportunities to which motivated offenders are attracted specifically for that reason (e.g., bars, see Gruenewald, Freisthler, Remer, LaScala, and Treno 2006; Livingston 2008; Roncek and Maier 1991). Businesses are 'crime generators' if many people come there without any particular criminal motivation but some potential offenders are also present who notice and exploit criminal opportunities (e.g., retail shops). Businesses are 'neutral' areas if they neither specifically attract offenders nor create easy criminal opportunities (Brantingham and Brantingham 1995).
- Businesses attract capable controllers, i.e., guardians. Jacobs (1961) acknowledges that businesses attract offenders, targets, and controllers, but comes to very different expectations. In her view, diverse and evenly distributed commerce primarily draws guardians, people who supervise and can also intervene in situations when necessary. In a sense, Jacobs hypothesizes that neighborhood businesses –as long as they are diverse and are situated among homes, resulting in genuine mixed use neighborhoods– provide what we might call 'crime buffers': places that provide a neighborhood with many capable controllers, leading

to less neighborhood disorder. In a recent empirical study Browning et al. (2010) found support for this view: after a certain threshold of increasing commercial and residential density, the prevalence of crime offences decreases.

In addition, businesses provide meeting places where residents can meet, thus creating and maintaining social ties with other residents (Jacobs 1961; Völker, Flap, and Lindenberg 2007). The importance of these ties for neighborhood order lies at the heart of social disorganization theory (Shaw and McKay 1969) and its recent extensions (e.g., Sampson and Groves 1989; Sampson, Raudenbush, and Earls 1997). This theory posits that three key neighborhood characteristics (i.e., high population turnover, low socioeconomic status and high ethnic heterogeneity) affect the development and maintenance of social bonds and mutual trust between local residents, as well as the creation and maintenance of certain norms of good behavior and active intervention. And, argues social disorganization theory, strong social bonds, mutual trust, norms for behavior and intervention together ensure that there is less neighborhood disorder (Bursik and Grasmick 1993, p. 30-38; Sampson, Raudenbush, and Earls 1997). The more businesses in a neighborhood which focus on a local clientele and where people can meet each other in person (e.g., a grocery store), the more likely it is that these businesses promote social cohesion and thus indirectly drive residents to behave appropriately.

- Businesses attract incapable controllers, i.e., guardians. In contrast to the view that businesses attract capable guardians, Taylor (1988) argues that residents feel less responsible in neighborhoods with mixed land use. In other words, he argues that business attract *incapable* guardians. Businesses attract visitors from within *and* outside the neighborhood, the latter increasing anonymity in the neighborhood. Taylor argues that, even with normal (i.e., non-deviant) use of the neighborhood by others, a resident's sense of territoriality is diminished by the presence of (many) others and (s)he is therefore less likely to keep watch and intervene. Furthermore, when businesses are closed, the empty establishments provide gaps in the territories of responsibility of the residents.

The three possible relationships between businesses and neighborhood disorder discussed above imply a passive role of businesses. Local businesses are primarily regarded as arenas for human interaction. We note that absent in previous studies is the characterization of the modern neighborhood economy, which consists of large numbers of solo entrepreneurs and free lancers active in small-scale business services, often operating from home which is facilitated by ICT. These rather invisible local businesses do not offer meeting places whatsoever. Is the business as meeting place perhaps unduly emphasized? Our literature overview continues with the idea that businesses owners and employees can also purposefully take *actions*. However, these actions may not always be in the best interest of the neighborhood.

- Businesses act as potential offenders. Largely absent from previous studies on disorder and crime in residential neighborhoods, it should be noted that businesses can also act as offenders. Some businesses produce litter, noise, or traffic congestion in their immediate surroundings. Here, we do not mean litter, noise

and traffic congestion caused by the visitors or clients, since this would be an example of attracting potential offenders. Instead, we argue that for some firm activities, business owners and employees themselves may be the cause of local physical and social disorder, e.g., noise and congestion generated by production processes or logistic issues, such as (un)loading merchandise.

- Business owners and employees act as controllers, i.e., place managers. Eck and Weisburd (1995) argue that businesses and business owners can directly combat disorder by exercising social control.<sup>76</sup> They are place managers who are responsible for their business and surrounding area. Place managers can actively intervene in deviant situations of social disorder (e.g., break-up a loud argument) or removing physical disorder (e.g., clean the street). This active role of neighborhood entrepreneurs as 'eyes on the street' was also recognized by Jacobs (1961). Clarke (1992) and Felson (2002) argue that employees of neighborhood businesses might be even more important to a neighborhood's order than the residents themselves, as business employees/owners are present in neighborhoods during working hours, whereas the (working) neighborhood residents often are not (provided the employees are themselves not residents of that neighborhood). Neighborhood firms are in general rather small, so they often do not have many employees who may exercise social control. However, many of these small businesses in residential neighborhoods are led by entrepreneurs living in close proximity, or are even operating their firm from home. This means that many business owners are both privately and professionally present in the neighborhood, i.e., conceptually combine the roles of guardian and place manager, which may increase their interest in solving local disorder.
- Business owners and employees actively promote social cohesion and indirectly produce capable guardians. Local business owners can –just like other neighborhood residents– organize or participate in activities with their neighbors which foster social cohesion and (indirectly) social control. For example, social activities with neighbors can give impetus to reciprocal relationships, in which the business owner looks after the neighborhood homes when the residents are at work during the day, and the residents look after the business premises when the business is closed. Thus, next to directly taking action as a controller, a business owner can also indirectly produce more guardianship among the neighborhood residents. This is an extension of the previous arguments, but we have not found this explicitly mentioned in previous research.<sup>77</sup>

In summary, previous research has focused mostly on the presence of (different types of) businesses in relation to neighborhood disorder (see also chapter 3 in this dissertation). In contrast, studies on the willingness to intervene and the actions of entrepreneurs on behalf of neighborhood disorder are scarce. In this study, we

76 As well as, perhaps, a deterrence function. A security guard may not even need to take action, because potential offenders are already discouraged to offend by his/her sheer presence.

77 For example, social disorganization theory emphasizes that, e.g., population turnover affects social cohesion, which in turn affects the capacity for social control. Acknowledging that neighborhoods consist of actors –residents, as well as business owners and employees– opens up the possibility that actors directly affect social cohesion by purposeful activities.

are able to empirically investigate *individual willingness to intervene* and *individual actions* which have potentially *positive* outcomes for the neighborhoods, i.e., a decrease of social and physical disorder. More specifically, the remainder of this paper is concerned with the (1) *individual willingness* to act as controllers, i.e., intervene in problematic neighborhood situations, and (2) *participation in activities* with neighbors, thereby arguably stimulating social cohesion or solving problematic situations.

## 6.2.2 Entrepreneurial actions on behalf of the neighborhood

### Beyond entrepreneurial profit seeking behavior

It has been more than twenty-five years since Granovetter's (1985) pivotal article on the social embeddedness of economic action, in which the interaction between the (social) environment and economic behavior was acknowledged. The many studies which build on his ideas fail to recognize that this interdependency of the social and the economic may also exist in the actual goals and behavior of economic actors. Most economic or business management scholars still investigate economic outcomes (at the firm or the neighborhood level), instead of social effects of economic actors (Barnes and Sheppard 1992; Steyaert and Katz 2004).

There are a few exceptions, however, which can be classified in two groups according to their emphasis on profit maximization. A first type of studies argues that entrepreneurs (un)intentionally acting on behalf of the community always have profit maximizing grounds. From their empirical study on business success in Iowa (USA), Kilkenny et al. (1999) conclude that a close interdependence between local firm success and community support build on a reciprocity mechanism: firms active in the local community will ultimately generate loyal local customers. A second group of studies emphasizes genuine social behavior of entrepreneurs. From studying new entrepreneurs in three communities, Johnstone and Lionais (2004) conclude that economically backward regions provide the arena for a new type of entrepreneurship in which the tools of traditional business and the goals of social entrepreneurship are combined. The aims of these 'community business entrepreneurs' genuinely go beyond economic profits as they actively contribute to improving the local community without expected returns on investment. Unfortunately, these studies from the economic and business management literature lack an overarching theory which can provide hypotheses on which types of entrepreneurs and businesses are more likely to act on behalf of the neighborhood. This redirects our search to the social science literature regarding individual action on behalf of the public good.

### A theoretical model of a capable controller

The capable controller is understudied in comparison to the suitable targets and potential offenders (Tewksbury and Mustaine 2003). Although the guardian is empirically shown to be a critical determinant of deviance (e.g., Coupe and Blake 2006; Sampson, Raudenbush, and Earls 1997; Wilcox Rountree, Land, and Miethe 1994), capable guardianship is not clearly specified in routine activity theory

(Reynald 2009). Some empirical studies have attempted to measure and assess the effectiveness of specific guardianship activities. For instance, according to Groff (2007), formal guardians (police officers) are better crime deterrents than informal ones (citizens); Miethe and Meier (1990) differentiate between social and physical guardianship, the former being more effective in reducing the victimization risk. Reynald (2009) conceptualizes a four-stage model of guardianship 'intensity'. In the first stage, guardians are unavailable. In the second stage, a potential guardian is available (i.e., present) when a deviant act occurs. When a guardian is available, the third stage defines that a guardian must then be capable to intervene. Finally, the fourth stage of guardianship is reached when the guardian is available and capable of intervention, and is furthermore willing to intervene in the deviant act. In an empirical survey among residents, Reynald (2010) further develops this model of guardianship by identifying several factors which affect the willingness to intervene in disorderly situations, such as physical competence, tools for protection (e.g., dogs) and the severity of the incident. We note that such factors are all indicators of potential benefits or costs. With less physical competence and fewer tools for protection, the risks to personal safety (i.e., costs) increase. Solving a severe incident is arguably of greater benefit than solving a minor incident, both for the intended target and for the neighborhood in general.

A safe and clean neighborhood, or in other words, a neighborhood with social and physical order, is an example of a public good. A public good is non-rivalrous, i.e., the consumption of such a good does not reduce the availability or diminish its value for others. It is also non-exclusive, in that no one can be effectively excluded from using the good. When the public good is threatened (e.g., by someone spraying graffiti on the walls or breaking into parked cars), every actor witnessing this can take action to protect the public good, or decide not to take action. Similarly, any actor can engage in activities which might promote social cohesion of the neighborhood (e.g., organizing or participating in a neighborhood barbecue), but one actor needs to volunteer to make this activity happen. Combined with this argument that solving disorder is a public good, Reynald's (2010) empirical findings correspond to the game-theoretical literature that models the decision to act on behalf of the neighborhood as a 'volunteer's dilemma'.<sup>78</sup> The volunteer's dilemma is found in the fact that although it is in the interest of every actor to volunteer and produce a public good (or reduce a public bad), every actor also prefers that someone else would volunteer instead. This could lead to the outcome that no one actually volunteers (Diekmann 1985).

Figure 6.1 presents the volunteer's dilemma. Every actor can decide to 'Volunteer' or to 'Abstain' from providing the public good. The volunteer's dilemma assumes that  $b > c > 0$ , that is, the benefits outweigh the costs of intervention, which are non-negligible. Because the costs of action are smaller than the potential benefits, every actor prefers to take action. However, the payoff of every actor is also dependent on whether others act. If at least one other volunteers, the actor will receive  $b$ , whereas (s)he receives  $b-c$  if (s)he volunteers. Thus, every actor prefers

<sup>78</sup> See chapter 5 of this dissertation for a more comprehensive description of this theoretical model. To avoid overlap as much as possible, we have tried to be as concise as possible while still highlighting the most important aspects of the individual-level theory of action.

to abstain from volunteering, and thereby –hopefully– receive  $b$  instead of volunteering and receiving  $b-c$ . Diekmann (1985) shows that under these assumptions, the probability that someone takes action on behalf of the public good increases with increasing benefits, decreasing costs, and decreasing group size.

		Number of others taking action	
		0	1 or more
Choice of focal actor	Volunteer	$b - c$	$b - c$
	Abstain	0	$b$

Figure 6.1 Volunteer’s dilemma payoffs for focal actor

Diekmann (1985) and authors of several extensions of this basic model (for an overview, see Franzen 1999) argue that the volunteer’s dilemma model is applicable to exactly the situations which we are interested in (e.g., intervention in a disorderly situation). As we discussed, Reynald’s (2010) respondents are more willing to intervene because of better physical competence, availability of tools for protection, risk to personal safety, and severity of the incident. Thus, she finds empirical support for one prediction of the volunteer’s dilemma model, i.e., that actors with a lower cost-benefit ratio are most likely to take action, but Reynald does not relate this to the game-theoretical model of the volunteer’s dilemma.

Present study: what makes a good place manager?

In the present study, we are able to investigate several instances of ‘volunteering on behalf of the neighborhood’. First, we investigate the *willingness* to intervene in *disorderly* and *criminal* situations. This reflects the last stage of Reynald’s model of guardianship: suppose that someone has observed deviant behavior, is (s)he willing to take action? Second, we investigate actual engagement in *activities with neighbors*. We distinguish two types of activities. We argue that *social* activities, such as participating or organizing drinking coffee, having a barbecue or having a party with neighbors, can be seen as investment in a public good, because such activities may promote social cohesion and mutual trust, and thereby, e.g., indirectly produce more capable guardians. The other type of activities, *social control* activities, involves organizing or participating in activities to clean the street, improving the safety of the neighborhood, or alerting the police.<sup>79</sup>

The main argument in the present study is that neighborhood *residents* differ from *local business owners*, residents who also operate their own business in the same neighborhood, because the latter group has extra ‘stakes’ in the neighborhood. They not only live there, but their business success is also dependent on the

79 The ‘social control’ activities in the present study have a disadvantage, namely that engaging in such activities is dependent on whether the neighborhood experiences problems in the first place. If only few deviant situations occur, then it is unnecessary to engage in these activities to begin with. Investigating the self-reported willingness to intervene circumvents this problem, but leaves unanswered to what extent self-reported willingness and action actually correlate.

well-being of the neighborhood.<sup>80</sup> Residents are guardians, while local business owners combine the role of guardian and place manager. We can therefore expect that local business owners are more willing to intervene in problematic situations, and are more likely to engage in neighborly activities than other residents.

We furthermore differentiate between the large group of residents using the labor market position as a key criterion. Previous research has emphasized the importance of employment status: unemployed people generally exhibit poorer quality of life (Hultman, Hemlin, and Hörnquist 2006) and are less active than employed people in a large number of ways, being more resigned and retreated from everyday life (Jahoda, Lazarsfeld, and Zeisel 1975). On the other hand, they are potentially more homebound than employed residents, of which the largest part is assumed to leave the neighborhood during the day for his/her job: therefore they have more opportunity to intervene in problematic situations. However, LaGrange (1999, p. 414) argues that because unemployed people lack the imposed constraints of a daily work schedule, they are "more likely to enter and depart their premises according to idiosyncratic circumstances rather than according to a repetitive and habitual routine. Residents of these areas are thus less likely to be able to assess the legitimacy or illegitimacy of neighborhood traffic, and they may therefore fail to challenge activities or persons about whom they are uncertain." In our explanatory analyses we compare local business owners (i.e., high exposure and strong incentives to intervene, because they live *and* work in the neighborhood) to local residents who do not work (i.e., moderate or idiosyncratic exposure and "normal" incentive to intervene) and employed residents (i.e., low exposure and normal incentive to intervene). We expect: *local business owners are more willing to intervene in problematic situations and are more likely to engage in neighborly activities than employed residents as well as unemployed residents* (Hypothesis 1).

If our empirical results support the hypothesis that local business owners are more (willing to be) active on behalf of the neighborhood than other residents, we next aim to explain this difference. In other words, we aim to ascertain what distinguishes a combination of guardian and place manager from a regular guardian. To be able to compare residents and local business owners, we need to identify characteristics shared by both. Based on the theoretical model of the volunteer's dilemma—specifically, Diekmann's (1993) paper on asymmetry in cost-benefits between actors— and Reynald's empirical study, we formulate a general hypothesis: actors who receive higher benefits from the produced good or have lower costs to produce it (i.e., have a low cost-benefit ratio), are more willing to act on behalf of the public good. In order to formulate specific hypotheses, we need to distinguish indicators of low costs to produce the desired neighborhood-level outcome, or high benefits that accrue to an actor. In this study we are not able to investigate differences in costs. We have no data on, e.g., the competence, availability of tools for protection or risk to personal safety, the costs identified by Reynald (2010).<sup>81</sup> Therefore, our

80 Business success is dependent on the neighborhood when we assume, e.g., that customers are less likely to visit businesses in dirty, badly maintained or unsafe neighborhoods. Conversely, for businesses who are not dependent on visiting customers, it is plausible that their owners are less likely to act as 'place managers' (on top of their role as 'guardians').

81 Costs can also be expressed by the time and money it takes to intervene. These cost indicators may vary

specific hypotheses will only reflect differences in benefits.<sup>82</sup> Similar to chapter 5 in this dissertation, we argue that homeownership, having no intention of moving, and being a member of a neighborhood association reflect one's personal 'stake' in the neighborhood, i.e., the importance of local order and the benefits of countering local disorder. As a result, we expect that these personal characteristics are related to more investments in local order. Thus, we expect: *residents or local business owners who (a) are homeowners, (b) have no intention to move house, or (c) are a member of a neighborhood association, are relatively more willing to intervene in problematic situations, and more likely to engage in activities with neighbors* (Hypothesis 2).

Next, specifically with regard to the *willingness to intervene* in problematic situations, we are able to test whether differences between local business owners and other residents are explained by perceived social cohesion and trust, and the expectations that people have about the behavior of others. The combination of these two concepts on the neighborhood-level into 'collective efficacy' is an important predictor of neighborhood crime rates (Sampson, Raudenbush, and Earls 1997). On the individual level, its implications are unclear. In chapter 5, we argued that the individual *perception* of social cohesion and individual *expectation* that others will intervene might affect one's individual action on behalf of the neighborhood. As such, if local business owners differ from other residents on this aspect, then this might explain (some of) the difference between local business owners and other residents with regard to their willingness to intervene. The empirical analyses in chapter 5 show that people who perceive *more* social cohesion and expect it *more* likely that others will intervene, in contrast to predictions by the volunteer's dilemma, are also more willing to intervene themselves. Given these empirical findings, the volunteer's dilemma may not be the most fitting theoretical model of the decision situation faced by residents: the theoretical model predicts one outcome, whereas the empirical findings with regard to residents point in the other direction.<sup>83</sup> Lacking a new theoretical model, we formulate an explicit two-sided hypothesis: *the level of perceived social cohesion and trust, and the level of expectations that others will intervene, affect an individual's willingness to intervene* (Hypothesis 3).

In addition to hypotheses based on the game-theoretical model of the volunteer's dilemma, we formulate a hypothesis based on entrepreneurial research regarding the 'entrepreneurial personality'. Scholars have argued entrepreneurs differ from other people with regard to their need for achievement (McClelland 1961), internal locus of control (Rotter 1966), and innovativeness (Mueller and Thomas 2001). Entrepreneurs have a strong need to achieve, "want to solve problems for themselves, set goals, and strive for these targets through their own efforts" (Littunen 2000). Entrepreneurs also have a higher internal locus of control, which refers to "control over one's own life, where the results of one's actions are considered to

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among entrepreneurs, due to differences in time invested in the business (or in competing tasks) and business profit margins. As such, in a follow-up study the model can be extended by including information on relative intervention costs of business owners.

82 Alternatively, one can think of benefits as the potential *loss* of payoff when the public good is *not* produced, or the public bad is *not* stopped.

83 This need not have implications for the hypothesis regarding the cost-benefit ratio (Hypothesis 2), as this hypothesis is robust across a variety of different models.

be dependent on one's own behavior or on one's permanent characteristics" (Lit-tunen 2000). These aspects of the entrepreneurial personality bear a similarity to 'self-efficacy', one's expectations of personal mastery (Bandura 1977). Self-efficacy theory argues that whether and to what extent people engage in certain activities is determined by their expectations of their personal efficacy. If entrepreneurs really differ from other people on these characteristics, then this may explain both why some residents are more likely than others to become self-employed as well as why these residents are more willing to act on behalf of the public good and are more likely to engage in neighborly activities. Thus, we formulate the hypothesis: *people with higher self-efficacy are more willing to intervene in problematic situations and are more likely to engage in neighborly activities* (Hypothesis 4).

Any remaining difference between residents and local business owners after testing the aforementioned hypotheses is arguably related to the business' economic stakes in the neighborhood. The propensity of business owners to act on behalf of the local public good depends on the importance of the local area for their firm. For example, we can argue that the dependence on and locality of professional local relationships with employees, customers and business partners as indicators of a local business. Note, however, that we cannot compare residents to the local business owners on these characteristics, because the former group simply does not have these characteristics. Thus, the last hypothesis reflects differences *between* local business owners, and not between local business owners and residents. *Between* local business owners, we expect that: *local business owners who are more locally dependent upon (a) employees, (b) customers, or (c) business partners are relatively more willing to intervene in problematic situations and more likely to engage in neighborly activities* (Hypothesis 5).

## 6.3 Data and methods

### 6.3.1 Data

To test our hypotheses, we use data from the second wave and an additional survey (see chapter 5) of the *Survey of the Social Networks of the Dutch* (SSND2), with a total of 895 respondents nested within 161 Dutch neighborhoods of 40 Dutch municipalities (Völker, Flap, and Mollenhorst 2007). We combined these data with the *Survey of the Social Networks of Dutch Entrepreneurs* (SSNE), a survey held in 2008/2009 in 145 of the 161 neighborhoods among 385 *local entrepreneurs*, business owners whose business is within a walking distance of ten minutes to their home.<sup>84</sup> Similar to the SSND, the SSNE consist of survey questions about, amongst other things, the respondents' opinions about social cohesion, mutual trust, expect-

84 Although this results in relatively few respondents per neighborhood –about 5 residents and 3 business owners per neighborhood– this should not be problematic for estimating association between variables. Snijders and Bosker (1999, pp. 144-150) show that clustering of data affects the standard errors of the parameter estimates the least when sampling many macro-units (i.e., neighborhoods) with relatively few micro-units (i.e., respondents).

tations about the intervention of others, and the activities in which the respondents engage with their neighbors.<sup>85</sup>

Because the SSNE data are limited to entrepreneurs who live and work in close proximity, the dataset on the one hand provides the possibility to closely investigate the interplay between neighborhood disorder, business and entrepreneur. On the other hand, we have no information about businesses of which the entrepreneur lives further away than ten minutes walking, and we have no information about entrepreneurs who happen to live in one of the 145 neighborhoods but have their business further away. Any conclusions we make after our explanatory analyses are based on the comparison of this specific group of business owners in comparison to neighborhood residents, which is why below we present the details on businesses and their owners in the SSNE dataset.

First of all, of the 385 of neighborhood businesses in our sample, 312 are home-based (81%): the business owner actually lives and works in the same (or adjoining) premises. The other 19% of the businesses are located (at most) within 10 minutes walking distance from the home of the respondent. Moreover, the businesses are quite small: about 50% (n=193) are run by the owner himself, 25% have only one employee besides the business owner, and 25% of the businesses have 2 or more employees. The youngest businesses are less than a year old, and the oldest business ages 280 years. About 25% of the businesses (n=96) are between 0 and 5 years of age, about 21% (n=81) are between 6 and 10 years of age, about 24% (n=90) are between 11 and 20 years of age, and about 30% of the businesses are older than 20 years. An old business of course does not necessarily mean it has long been present in the neighborhood: it could have recently moved to one of the neighborhoods in our sample. However, statistics show that about 70% (n=270) of the businesses were started in the neighborhood and have never moved. About 91% (n=349) of the business owners also stated that they had no plans to relocate the business within the next two years. Table 6.1 shows the sectors the local businesses operate in.

The business owners prefer the business to continue the way it currently does, or do slightly better than previous years. When asked about their goals for the next two years, about 80% of the business owners state that they want the business turnover, business profit, and number of customers to remain the same or to increase only slightly. In addition, 276 of the 385 business owners (72%) stated that they want the number of employees to remain the same over the next two years.

The relatively small businesses in the SSNE, which are located in neighborhoods where people live and work (i.e., mixed neighborhoods) and the business owner himself also lives, perhaps are more regularly visited by customers than other types of businesses. The data show quite some variation in the visiting frequency of clients. About 19% of all local businesses are visited daily by more than five customers; about 21% are visited by customers weekly or daily, but never more than 5 customers per day; about 16% are visited by customers biweekly to once a month; 42% of the businesses are almost never visited by customers. On a scale of 1 to 5, in which 1 denotes 'different customers' and 5 denoted 'regular customers', about

85 It was expected that entrepreneurs would be more likely to participate in a short survey than in a long survey. Therefore a subset of the SSND questions was used in the SSNE, which was further supplemented with new questions about the firm of the entrepreneur.

60% of the business owners reported that the business was frequented mostly by regular customers (category 4 and 5). In addition, about 45% of the business owners reports that (s)he does not have any informal contact with other businesses in the neighborhood. Of the business owners who do have informal contact with other businesses, we asked about the frequency of this informal contact: daily (17%), weekly (22%), biweekly (13%), monthly (20%), once every three months (13%), and less often (15%).

Table 6.1 Sector of the neighborhood businesses in the SSNE dataset

	Frequency	Percent
Retail	62	16.1
Foodservice	15	3.9
Personal services and private education	38	9.9
Business services	134	34.8
Cultural activities	29	7.5
Manufacturing and construction	62	16.1
Other	45	11.7
Total	385	100.0

Source: SSND2, additional SSND2 survey, and SSNE.

In summary, the businesses in the SSNE dataset are operated by entrepreneurs who also live in the same neighborhood and who often run their firm from home. Most of the businesses are quite small and about half are less than ten years of age. Most of the businesses are rooted in the neighborhood as they both started in the neighborhood and have not relocated since. The majority of the businesses are frequented mostly by regular customers, although this does not necessarily mean customers visit frequently – about only one out of five businesses is visited daily by more than five customers.

### 6.3.2 Measurements

#### Dependent variables

The respondents, both local residents and local business owners, received the following examples of situations which might occur in their neighborhood: (1) (truant) children loitering; (2) children arguing and fighting; (3) people having a loud argument; (4) adolescents spraying graffiti on a wall; (5) someone breaking into a house; (6) someone is fiddling with / breaking into someone's car. For each of these situations, the respondents were asked whether they would take any action if they heard or saw one of the following situations happen in their neighborhood, with the following answer categories: 'definitely not'; 'probably not'; 'maybe, maybe not'; 'probably', and 'definitely'. Situations 1-3 may be considered as *disorder*, situations which are troublesome and potentially threatening, but not criminal acts per se. Situations 4-6 may be considered as *crime*, because these acts are prohibited by law and also more harmful than the disorderly acts.

The respondents –both residents and local business owners– were also confronted with examples of various activities, and respondents were asked to indicate if they had recently engaged in these activities with their neighbors. Each of these activities could be initiated by the respondent, his/her neighbors, another neighbor, or an organization. Some activities reflect social activities, namely ‘drinking coffee’, ‘having a barbecue’ and ‘(co-)hosting a party’. Other activities reflect social control, namely ‘actions to improve the safety of the neighborhood’, ‘cleaning the neighborhood’, and ‘alerting the police’.

#### Independent variables

As argued in the theoretical section of this paper, the expected costs versus the potential benefits of an action affect one’s willingness to intervene, and affect the decision to engage in activities on behalf of the neighborhood. In addition, similar to chapter 5, we hypothesized that a respondent’s perception of the neighborhood’s cohesion and mutual trust, as well as his expectations about the actions by others, is related to a higher willingness to intervene. Lastly, we hypothesized that a respondent’s self-efficacy is related to higher engagement in activities and willingness to take action on behalf of the public good. Descriptive statistics of the variables are presented in table 6.2.

Table 6.2 Descriptive statistics of independent variables and control variables

	Mean	S.D.
<i>Individual predictors</i>		
Homeowner	0.73	
Member of neighborhood association	0.17	
Wants to move	0.13	
Self-efficacy (-2 to +2)	0.74	0.46
<i>Perception of neighborhood</i>		
Perceived cohesion and trust	0.00	0.67
Expects others to take action (-2 to +2)	0.45	0.90
<i>Control variables</i>		
Female	0.43	
Foreignborn	0.06	
Age	52.63	12.66
Level of education	0.00	2.21

Note: Self-efficacy and expectations of actions by others are centered on the middle category ‘maybe, maybe not’. Perceived cohesion and trust, and level of education are grand-mean centered. Age is shown in original format here, but grand-mean centered in analyses.

Source: SSND2, additional SSND2 survey, and SSNE.

For the individual cost-benefit characteristics, we discriminate between *homeownership*, *plans to move*, and *being a member of a neighborhood association*. As a homeowner, one arguably receives higher (potential) benefits from a clean, safe and cohesive neighborhood than home renters do, because one can probably sell

the home at a higher profit. When a respondent has plans to move, intervention or engaging in neighborhood activities do not provide future benefits: with a short time horizon, it is more profitable to free-ride on the activities of others. Being a member of a neighborhood association is a general measure of personal stake in the neighborhood.

The *perceived social cohesion and trust* among residents was measured as the mean of two items: 'people in this neighborhood have good contact with each other' and 'people in this neighborhood trust each other' with five answer categories: 'totally disagree'; 'disagree', 'not disagree, but also do not agree'; 'agree'; 'totally agree'. We also argued that one's willingness to intervene on behalf of the public good is affected by the belief that other people from the neighborhood will take action. We constructed categories of *expectation of action by others* with regard to 'disorderly' situations (Cronbach's alpha = .644) and 'criminal' situations (Cronbach's alpha = .755).

Our measure of *self-efficacy* was constructed by taking the mean of six questions: 'If I spend enough effort, I can solve any problem'; 'It is easy for me to stick to my plans and attain my goals'; 'I believe I can handle unexpected situations'; 'Because of my ingenuity I know how to act in unforeseen situations'; 'If I'm confronted with a problem, I usually have multiple solutions'; 'Whatever happens, I can manage'. Each of the five questions has the following answer categories: 'strongly disagree'; 'disagree'; 'do not agree, do not disagree'; 'agree'; 'strongly agree' (Cronbach's alpha = .724).<sup>86</sup>

### 6.3.3 Multilevel analysis

The explanatory analyses of this study consist of multilevel analyses, regression analyses which account for the nested structure of the data (i.e., respondents nested within neighborhoods). We investigate the effect of (1) the individual characteristics of the respondent, (2) the perceptions of population turnover, ethnic heterogeneity, and cohesion and trust among residents, (3) the individual perceptions of the actions of others, and (4) the reported self-efficacy of the respondent. In addition to the aforementioned variables, we control for sex, ethnic background (coded as a dummy variable: 0= born in the Netherlands, 1=elsewhere), age (both linear and non-linear effects), and level of education of the respondents.<sup>87</sup> The descriptive statistics of these variables are also included in table 6.2.

86 This paper does not focus on the *sources* of self-efficacy (Bandura 1977, p. 195). Here, our interest is only in the level of personal efficacy expectations themselves, "the conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura 1977, p. 193).

87 Level of education was originally coded in 9 different categories. A test for non-nested model fit using Akaike Information Criterion (AIC) showed that the best fitting model assumed an interval scale. The AIC equals  $l+2p$ , where  $p$  is the number of parameters in the model,  $l$  is the deviance or  $-2 * \log \text{likelihood}$  statistic, and the model with the smallest AIC fits best (Rasbash, Charlton, Browne, Healy, and Cameron 2009; Rasbash, Steele, Browne, and Goldstein 2009).

## 6.4 Results

### 6.4.1 Descriptive results

Table 6.3 presents the percentage of respondents willing to intervene in six disorderly or criminal situations. The respondents are divided into three groups: local business owners, unemployed neighborhood residents and employed neighborhood residents (but who do not own a business in the neighborhood). The responses of the respondents vary more for the disorderly situations (i.e., loitering, arguments, and fighting) than for the criminal situations (i.e., graffiti, breaking into houses or cars).

Table 6.3 Percentage of respondents (unemployed residents, employed residents, and local business owners) who are willing to take action to remedy a problematic situation

% respondents willing to take action when...			Definitely not	Probably not	Maybe, maybe not	Probably	Definitely
DISORDER	(Truant) children loitering	Unemployed residents	19	18	10	30	23
		Employed residents	12	18	15	29	26
		Local business owners	12	22	12	27	28
	People having a loud argument	Unemployed residents	25	31	17	15	11
		Employed residents	9	21	24	29	17
		Local business owners	9	23	19	28	20
	Kids fighting	Unemployed residents	12	15	17	30	26
		Employed residents	5	10	16	36	33
		Local business owners	4	12	11	39	35
CRIME	Spraying graffiti	Unemployed residents	6	6	4	26	59
		Employed residents	1	4	3	29	63
		Local business owners	2	3	3	26	66
	Breaking into a house	Unemployed residents	2	3	4	19	73
		Employed residents	1	1	2	21	76
		Local business owners	1	1	2	22	74
	Fiddling with / breaking into car	Unemployed residents	1	2	3	18	75
		Employed residents	0	1	2	20	77
		Local business owners	1	1	2	22	75

Note: *N*: unemployed = 363, employed = 532, local business owner = 385. *N* disregarding missing data: unemployed = 330-359, employed residents = 517-531, local business owners = 378-383. The percentage reported is valid percent. Source: SSND2, additional SSND2 survey, and SSNE.

For example, about 19% of the unemployed residents are 'definitely not' willing to take action to stop children from loitering and 23% are 'definitely' willing to do so (and the respondents are semi-equally divided over the other answer categories). In comparison, only 2% of the unemployed residents would 'definitely not' take some action when they see someone breaking into a house, and 73% would 'definitely' take action. Tests for differences between the groups of respondents showed that *for the disorderly situations*, local business owners differ significantly from unemployed residents, but do not differ significantly from employed residents.

Table 6.4 presents the percentage of respondents that recently participated or organized activities with their neighbors. A higher percentage of respondents reported to have engaged in 'social' activities than in 'social control' activities, although there is also quite some variation between the various social activities. More than half of all three groups of respondents reported to have recently spent time drinking coffee with their neighbors, whereas about 15 to 20 percent reported either having a barbecue or hosting a party. There is less variation between the three social control activities: about 6 to 14 percent of the respondents reported having participated in these activities with their neighbors. For all of these activities, there are no significant differences between the three groups of respondents.

Table 6.4 Percentage of respondents (unemployed residents, employed residents, and local business owners) who participated or organized activities with neighbors

	Unemployed residents	Employed residents	Local business owners
<hr/>			
% participated in or organized activity with neighbors			
<hr/>			
<i>Social activities</i>			
Coffee drinking with neighbors	57	56	55
Barbecue with neighbors	15	20	21
Neighbor(hood) party	18	19	20
<i>Social control activities</i>			
Improving the safety of the neighborhood	9	9	10
Cleaning the neighborhood	7	6	8
Alerting the police	10	11	14

Note: N: unemployed residents = 363, employed residents = 532, local business owner = 385. N disregarding missing data: unemployed residents = 326-330, employed residents = 480-482, local business owners = 335-337. The percentage reported is valid percent. Source: SSND2, additional SSND2 survey, and SSNE.

In summary, we do not find significant differences between the local business owners, unemployed residents, or employed residents, with regard to their engagement in *activities with neighbors*. In addition we do not find significant differences between the three groups with regard to their willingness to intervene in *criminal situations* (i.e., spraying graffiti; breaking into a house; fiddling with or breaking into a car). Therefore, in the following explanatory analyses in which we aim to ex-

plain differences between local business owners and other neighborhood residents, we only focus on the *willingness* to intervene in *disorderly* situations.<sup>88</sup>

#### 6.4.2 Explanatory analyses

The results of the multilevel regression analyses on willingness to intervene in disorderly situations are presented in table 6.5. We first compare local business owners to employed residents who are not self-employed or who do not operate their own business in the neighborhood where they live, with regard to their willingness to intervene in disorderly situations. Second, we compare local business owners to unemployed residents. For both comparative settings, we first investigate the relationship between the stakes of a respondent in the neighborhood and the willingness to intervene (Model 1). Then, we include the perceptions of a respondent about social cohesion, mutual trust, and the actions by others in the neighborhood (Model 2). Lastly, we include a measure reflecting self-efficacy (Model 3). In each model a dummy variable 'Local business owner (yes/no)' is included which reflects the extent to which a local business owner is more willing to intervene in disorderly situations than the comparison group, controlling for the other variables in each model. In all models, we also control for respondent's age, sex, education ethnic background, and income.

When we compare local business owners to *employed* residents (who are not self-employed or who do operate their own business in the neighborhood where they also live), Model 1 shows that local business owners do not report significantly higher willingness to intervene than employed residents. Only homeownership is significantly related to a higher willingness to intervene in disorderly situations ( $B=.339, p<.001$ ). Model 2 includes a respondent's perception of social cohesion and mutual trust, as well as a respondent's expectations that others will intervene in these situations. When a respondent expects that others will intervene, (s)he is also more willing to intervene ( $B=.699, p<.001$ ). Homeowners are more willing to intervene than people who rent their home, but the strength and significance level of the predictor has decreased ( $B=.163, p<.05$ ). Again, we do not find support for any differences between local business owners and employed residents. Model 3 shows that, as expected, a higher reported level of self-efficacy is related to higher willingness to intervene in disorderly situations ( $B=.230, p<.001$ ). The effect of homeownership and expected actions by others are similar to Model 2, and local business owners still do not significantly differ from employed residents. In models 2 and 3, the neighborhood-level variance is not significant, suggesting that there is no clustering of data. Differences between individuals can be explained by individual-level differences.

When we compare local business owners to *unemployed* residents, Model 1 shows that variables reflecting one's stake in the neighborhood are all significantly related to the willingness to intervene. Homeowners ( $B=.204, p<.05$ ) and members of a neighborhood association ( $B=.206, p<.05$ ) are relatively more willing to

<sup>88</sup> Analysis of scale reliability shows that the willingness to intervene in the three disorderly situations have a Cronbach's alpha of .724. Because the three situations are also conceptually related to the same underlying problem (i.e., disorder), we have combined the three situations into one 'disorder' measure.

Table 6.5 Parameter estimates of multilevel regression analysis comparing local business owners to employed residents and unemployed residents with regard to the willingness to intervene in disorderly situations.

	Local business owners and employed residents						Local business owners and unemployed residents					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Intercept	0.262	0.095**	-0.007	0.078	-0.173	0.090+	0.165	0.115	-0.016	0.098	-0.190	0.105+
<i>Is local business owner</i>	0.036	0.068	0.051	0.056	0.008	0.056	0.215	0.093*	0.130	0.078+	0.066	0.078
<i>Individual stakes</i>												
Homeowner	0.339	0.085***	0.163	0.070*	0.173	0.069*	0.204	0.091*	0.061	0.077	0.060	0.077
Wants to move	-0.277	0.098**	-0.099	0.081	-0.096	0.080	-0.263	0.116*	-0.077	0.099	-0.081	0.098
Neighborhood association	0.085	0.091	0.005	0.073	0.017	0.073	0.206	0.105*	0.047	0.088	0.063	0.087
<i>Perceived nbhd characteristics</i>												
Cohesion and trust	0.023	0.044	0.023	0.044	0.002	0.044	0.002	0.044	-0.017	0.051	-0.034	0.050
Expect others to intervene	0.699	0.033***	0.699	0.033***	0.702	0.033***	0.702	0.033***	0.652	0.037***	0.640	0.036***
<i>Self-efficacy</i>												
Neighborhood-level variance	0.059	0.027*	0.024	0.016	0.025	0.016	0.081	0.034*	0.066	0.025**	0.060	0.024*
Individual-level variance	0.936	0.049***	0.615	0.032***	0.606	0.032***	0.954	0.056***	0.645	0.038***	0.633	0.038***
Deviance	2573.9		2167.7		2157.9		2122.4		1837.4		1821.2	
N respondents	896		885		885		727		719		718	

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; +  $p < .1$  (two-tailed tests). Source: SSND2, additional SSND2, and SSNE (also controlling for age, sex, ethnic background and education).

intervene. If a respondent wants to move house, (s)he is less willing to intervene in disorderly situations ( $B=-.263, p<.05$ ). In addition, controlling for such stakes, local business owners are *more willing* to intervene in disorderly situations than unemployed residents ( $B=.215, p<.05$ ). Model 2 shows that, similar to the comparison between local business owners and employed residents, higher expectations that others will intervene is related to higher individual willingness to intervene ( $B=.652, p<.001$ ). Local business owners still report higher willingness to intervene in disorderly situations than unemployed residents ( $B=.130, p<.1$ ).<sup>89</sup> Lastly, Model 3 shows that higher self-efficacy is significantly related to higher willingness to intervene ( $B=.286, p<.001$ ). Now, local business owners can no longer be significantly distinguished from unemployed residents with regard to their willingness to intervene in disorderly situations. The neighborhood-level variance is consistently significant, implying clustering of data. Respondents within neighborhoods are more similar than respondents between neighborhoods.

Table 6.6 Parameter estimates of multilevel regression analysis comparing local business owners to employed residents and unemployed residents with regard to the (a) expectations that others will intervene in disorderly situations, (b) self-efficacy.

	Local business owners and employed residents				Local business owners and unemployed residents			
	Expect others to intervene		Self-efficacy		Expect others to intervene		Self-efficacy	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Intercept	0.607	0.054***	0.684	0.025***	0.465	0.082***	0.636	0.040***
Is local business owner	-0.006	0.057	0.194	0.030***	0.164	0.081*	0.241	0.041***
Neighborhood- level variance	0.066	0.022**	0.000	0.000	0.078	0.028**	0.000	0.000
Individual- level variance	0.666	0.035***	0.187	0.009***	0.730	0.043***	0.208	0.011***
Deviance	2309.2		1111.0		1972.5		995.7	
N respondents	905		916		741		747	

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; +  $p < .1$  (two-tailed tests). Source: SSND2, additional SSND2 survey, and SSNE (also controlling for age, sex, ethnic background and education).

In summary, local business owners do not differ significantly from *employed* residents on their willingness to intervene in disorderly situations. However, local business owners do differ significantly from *unemployed* residents. In comparison to unemployed residents, the analyses suggest that individual differences in expectations

<sup>89</sup> We report two-tailed tests of significance in the tables. Because we have hypothesized that local business owners are *more* willing to intervene than others the p-value should be halved. Thus:  $B=.130$  with  $p<.05$ . Note that except for hypothesis 3, our other hypotheses are also one-sided. For the other variables, however, one-tailed tests do not change the substantive interpretation.

that others will intervene and self-efficacy might explain this. To further investigate this, we performed multilevel regression analyses with 'local business ownership' as a predictor of (1) expectations that others will intervene and (2) self-efficacy. The results of these analyses are presented in table 6.6.<sup>90</sup>

Table 6.6 shows that local business owners have higher expectations than unemployed residents that others will intervene in disorder ( $B=.164, p<.05$ ), but their expectations about others' behavior does not differ significantly from the expectations of employed residents. Local business owners have significantly higher self-reported self-efficacy than employed residents ( $B=.194, p<.001$ ) as well as unemployed residents ( $B=.241, p<.001$ ). These results support the notion that both expectations about the behavior of others as well as self-efficacy explain the effect of local business ownership on the willingness to intervene in disorderly situations. Most strikingly, local business owners have a much more positive view than unemployed residents with regard to the engagement of others.

## 6.5 Conclusion

This paper focused on the role of local business owners as 'guardians' as well as 'place managers'. Local business owners are not only residents (i.e., who can act as guardians on behalf of the neighborhood) but also have their own business in the same neighborhood (i.e., they are place managers). Thus, these actors have more stakes in the neighborhood than regular residents, and can therefore be expected to be relatively more willing to exercise social control and participate in neighborhood activities. The central research question of this paper was: *are neighborhood entrepreneurs more willing to intervene in problematic (i.e., disorderly and criminal) situations than other neighborhood residents, and are they more likely to engage in (social and social control) activities with their neighbors than other neighborhood residents, and how can we explain this?*

We first focused on the *willingness to intervene* in *disorderly* or *criminal* situations. These variables are not dependent on whether such situations have actually recently taken place: the question is whether a respondent is willing to intervene if such a situation should occur. We found that almost all respondents are willing to intervene in criminal situations. When a respondent notices someone breaking into a house, about 75% takes action, regardless of whether the respondent is a local business owner or resident. With regard to the willingness to intervene in *disorderly* situations, we do find more variation and larger differences between local business owners and other residents. Specifically, local business owners are *more* willing to intervene than *unemployed* residents. Local business owners are not significantly different from employed residents.

In the theoretical section of this paper, we argued that respondents might view *social activities* as a way to improve the neighborhood. Participating or organizing such activities as drinking coffee, having a barbecue or having a party with neigh-

<sup>90</sup> The analyses show that self-efficacy does not cluster in neighborhoods, and thus that standard (i.e., one-level) regression analysis is sufficient. To remain consistent, however, we present the result of the multilevel results. The results of one-level regression analyses are similar to these multilevel results.

bors, can be seen as investment in a public good, because such activities may promote social cohesion and mutual trust, and thereby, e.g., indirectly producing more capable guardians. In this paper, we hypothesized on differences between local business owners and other neighborhood residents with regard to their engagement in such activities. However, the empirical analyses show that there are no differences between local business owners and residents with regard to their engagement (i.e., participation or organization) in social activities with their neighbors.

Similarly, we did not find evidence for differences between local business owners and residents with regard to their engagement in *social control activities* with their neighbors, i.e., activities to clean the street, improving the safety of the neighborhood, or alerting the police. The absence of significant differences might partly be explained by our research design, in particular the types of neighborhoods under study. In order to engage in such activities, problems must be present in the first place: the neighborhood must be dirty (i.e., so dirty as to warrant extra cleaning on top of the municipal cleaning services) or a crime must be taking place. The neighborhoods in our sample are a random sample of Dutch neighborhoods, and Dutch neighborhoods in general are rather clean and safe. Probably because of this reason, very few respondents had recently engaged in social control activities to begin with, which makes it extra difficult to find significant differences between groups of respondents. In summary, we partly find support for Hypothesis 1, only with respect to the willingness to intervene in disorderly situations. Because we did not find differences between local business owners and residents in social activities and social order activities, in the subsequent exploratory analyses we focused on willingness in disorderly situations only.

Hypothesis 2 reflected a respondent's stake in the neighborhood. We expected that respondents who are homeowners, have no intention to move house, or are a member of a neighborhood association, are relatively more willing to intervene in disorderly situations. Although we found support for this hypothesis in the beginning of our analyses, after controlling for other expectations we only find that homeowners are more willing to intervene in disorderly situations in a comparison between local business owners and employed residents.

Similar to the findings in chapter 5, we find that respondents with higher expectations that others will intervene, are themselves also more willing to intervene in disorderly situations (Hypothesis 3). In addition, local business owners have higher expectations about others' likelihood of action than unemployed residents, which partly explains why local business owners are more willing to intervene than unemployed residents.

We find support for Hypothesis 4, i.e., that respondents with higher self-efficacy are more willing to intervene in disorderly situations. Because local business owners differ from unemployed (as well as employed) residents in self-efficacy, this also explains why local business owners are more willing to intervene than unemployed residents. After controlling for the other explanations, we do *not* find an extra effect of being a local business owner on one's willingness to intervene. This means that there is no longer support for Hypothesis 1 once we take into account other factors. These results suggest that residents who combine place management and guardianship because they live *and* operate their own business in the neighborhood do not

differ from regular guardians after taking self-efficacy into account.

The previous finding implies that the effect of business' local economic stakes on willingness to intervene in disorderly situations (Hypothesis 5) will not be strong, if present at all. Indeed, a subsequent analysis (not shown in the tables) in which we compared local business owners with different local economic stakes ( $N=385$ ), also did *not* reveal that local business owners who are more locally dependent upon employees, customers, or business partners are relatively more willing to intervene.

In summary, we find that business owners differ significantly from *unemployed* residents with regard to their *willingness to intervene in disorderly* situations (i.e., children loitering, fighting, or loud arguments on the street). This effect is independent of personal characteristics reflecting the stake in the neighborhood, such as homeownership, intentions to move, and membership of a neighborhood association. The difference between business owners and unemployed residents decreases after controlling for a respondent's expectations about the actions of others (i.e., whether the respondent expects that neighbors will also intervene in disorderly situations). In addition, we no longer find any significant difference between local business owners and unemployed residents after controlling for a general measure of self-efficacy, or one's belief in one's own capabilities to solve problems. We do not find evidence that local business owners with a higher economic stake in the neighborhood, such as a higher percentage of regular customers or having a local business partner, are more willing to intervene in disorderly situations than other local business owners.

## 6.6 Discussion

This paper makes two contributions to the existing literature. First, we provided a systematic overview of the literature with regard to the effect of business presence on neighborhood disorder. In short, we have classified previous studies based on their arguments on *positive* as well as *negative* effects of businesses, which are the result of *presence* of businesses (i.e., a *passive* effect, as a meeting place for potential offenders, suitable targets, and capable guardians) as well as *actions* of businesses and business owners (i.e., an *active* effect, by acting as offenders, place managers, or actively promote social cohesion). In doing so, we provided a conceptual scheme with which the potential effects of local businesses on neighborhood livability can be understood.

Second, we empirically investigated one understudied subject, namely *individual actions* which have potentially *positive* outcomes for the neighborhoods, i.e., a decrease of social and physical disorder. As such, we contribute to the existing literature by investigating 'guardianship'. Previous studies have recognized that employees can act as place managers (e.g., as a store clerk), but they have neglected that most neighborhood firms are small or run by solo entrepreneurs: therefore, an investigation into the actions of entrepreneurs, or business *owners*, is important. Moreover, many businesses in mixed use neighborhoods involve small-scale business services, often operating from home and facilitated by ICT. Such local businesses do not offer meeting places for potential offenders, suitable targets,

and capable guardians at all. In the empirical part of this study, we focused on *local business owners*, i.e., residents who also operate their own business in the same neighborhood as where they live. These residents combine guardianship and place management, and are therefore considered more likely to take actions aimed to improve the neighborhood. We investigated the differences between local business owners and other residents (i.e., employed and unemployed residents) with regard to their willingness to intervene in problematic situations and their engagement in activities with their neighbors.<sup>91</sup>

Our empirical results reveal only a significant difference between local business owners and unemployed residents with regard to the willingness to intervene in disorderly situations, showing the entrepreneurs to be more engaged. The results suggest that the differences between these two groups can be explained by one's expectations about the actions of other residents and differences in self-efficacy. These findings are intriguing for two reasons. First, even though local business owners combine guardianship and place management, they are *not* more likely to engage in (social or social control) activities (although, to be fair, there are some measurement problems regarding these activities). Local business owners are also *not* more willing to intervene in criminal situations than other residents. We only find empirical support that local business owners are more willing to intervene in disorderly situations than unemployed residents. These results suggest that a combination of guardianship and place management together in one actor does not add up to even more willingness to intervene than simply being a guardian.

Even though local business owners cannot be distinguished from employed residents with regard to their willingness to intervene in problematic situations, we need to interpret this in terms of both exposure to (dis)orderly neighborhood situations and opportunity to act (Reynald 2009). Not all people are equally present during the day in a neighborhood. People can be *employed* and *unemployed*; employed people can work in the *same* neighborhood as where they live or *somewhere else*; and at both of these locations, these people can be *business owners* or *business employees*. Which of these actors spends most time in a neighborhood, and thus most often is exposed to disorderly situations, and therefore has the opportunity to take action on behalf of the public good? Because local business owners not only operate their firm during the day, but because they live there as well, we argue that they spend most time in the neighborhood. Next, employees of neighborhood businesses, who may or may not also be residents of that neighborhood, are present during working hours.<sup>92</sup> Unemployed residents can also be present during most of the day, and may act as (capable) guardians, but they are also free to leave the neighborhood (e.g., to spend leisure time or do volunteer work). Continuing, visitors to the neighborhood spend some time there, but we cannot be sure they have good intentions: some of these actors might be potential offenders. Lastly, residents

91 Note, however, that while the volunteer's dilemma argument is actually based on the individual cost-benefit ratio influencing *individual* action, our statements on social and social control activities involved actions undertaken *with neighbors*.

92 Of our 532 employed residents, about 10% was employed within a kilometer away from their home, and 7.8% was employed between one and two kilometers from their neighborhood. Accordingly, more than 80% of the residents are not present in their home-neighborhood during their working hours.

who are employed *outside* the neighborhood where they live are only present after working hours –often in the evening and the weekends. Our findings point out that of the two groups which arguably spend most time in the neighborhood, i.e., local business owners and unemployed residents, local business owners are more willing to intervene in disorderly situations. In summary, even though local business owners cannot be distinguished from employed residents with regard to willingness to intervene in disorderly situations, the former group has more opportunities to intervene in disorderly situations than the latter group.<sup>93</sup>

We offer several suggestions for future research. First, although we have argued that local business owners spend more time in the neighborhood than other residents, we do not know this with certainty. The sector in which the business operates might be an indication: we expect that many business active in the construction sector (about 16% of the local business owners in our data) are run by entrepreneurs who are 'on the move' during the day. A more detailed investigation into this issue is prudent. Second, our data encompass very specific groups: employed residents (mostly working outside the home-neighborhood), unemployed residents, and residents who also have their own business in the neighborhood where they live. Because of this reason, we could not compare, e.g., local business owners (both potential guardians *and* potential place managers) to owners/employees of businesses who do *not* live in the neighborhood (only potential place managers). More generally, future research would ideally compare all of the combinations of (non-) resident, (un)employment, and business ownership with regard to the willingness to intervene in disorderly situations. Third, this study shows that both perceived collective efficacy and self-efficacy are related to one's willingness to intervene in disorderly situations. The interrelationship between these two types of belief, i.e., belief in the capability of the *group* (Sampson, Raudenbush, and Earls 1997) and belief in one's *own* capabilities, and the effect thereof on individual action on behalf of the public good merits closer investigation. Last but not least, the significant neighborhood-level variance, albeit small, and only in the models including local business owners and unemployed residents, suggest that the willingness to intervene in disorderly situations may also depend on the specific neighborhood context, next to individual-level determinants. More insight in the specific neighborhood characteristics that affect local residents' (including business owners) willingness to intervene calls for empirical studies using both individual and neighborhood-level data. The insights resulting from these future analyses may in due time help to develop neighborhood policy instruments aimed at increasing feelings of responsibility and active intervention in neighborhood disorder of all local residents involved.

93 One could argue, however, that the presence of businesses is the reason that controllers –either guardians or place managers– need to intervene in disorderly situations in the first place, because businesses attract potential offenders. Although local business owners are more willing to intervene in disorderly situations than unemployed residents, would the neighborhood as a whole be better off (at least with regard to disorder), without the business?



# Chapter 7

## SUMMARY AND SUGGESTIONS FOR FURTHER RESEARCH



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# Summary and suggestions for further research

## 7.1 Introduction

This dissertation aims to investigate the effect of neighborhood community characteristics and the effect of local businesses on a neighborhood's social and physical disorder (i.e., troublesome and potentially threatening behavior or physical manifestations of such behavior).<sup>94</sup> Complementary arguments from social disorganization theory and routine activity theory are combined to derive hypotheses on the effect of business presence and the actions by local business owners on the level of social and physical disorder. Thereby we aim to answer the overarching research question:

*How can neighborhood differences in social and physical disorder be explained, and what is the relative contribution of neighborhood community, business presence and entrepreneurs to social and physical disorder in neighborhoods?*

Traditional explanations (i.e., 'community') are provided by social disorganization theory. This theory focuses on processes of social control at the neighborhood level by *residents*: social disorganization theory argues that neighborhoods with certain structural characteristics (e.g., high population turnover) are more likely to experience disorder because they have lower levels of social cohesion, trust, and social control (Bursik and Grasmick 1993). Routine activity theory argues that most deviance occurs during the routine activities that people conduct in their daily lives, such as working and shopping. In addition, routine activity theory emphasizes an implicit assumption in all other theories, namely that for any deviant act to occur, motivated offenders must have contact with suitable targets in the absence of capable guardians (Cohen and Felson 1979).

As shown in figure 7.1, social disorganization theory is first investigated separately in chapter 2. *Neighborhood-level* longitudinal data are used to disentangle cause and effect. In this chapter, we investigate *residents*. Next, we combine the two theories to provide complementary hypotheses in chapter 3. In this chapter we investigate, again on the *neighborhood-level*, to what extent (different types of) businesses are suitable places: places that are most conducive to the convergence of potential offenders and suitable targets in the absence of capable guardians. Moreover, we investigate the role of business employees. Business may facilitate meeting

<sup>94</sup> As discussed in chapter 1, this dissertation is part of an overarching research program in which other projects focus on the effect of neighborhood community on business success, as well as the interaction between neighborhood success (i.e., social and physical order) and business success.

of offenders and targets, but employees can also act as ‘place managers,’ people who bear responsibility for a specific place (i.e., the business and its surroundings), and are thus arguably more inclined to exercise social control than residents.

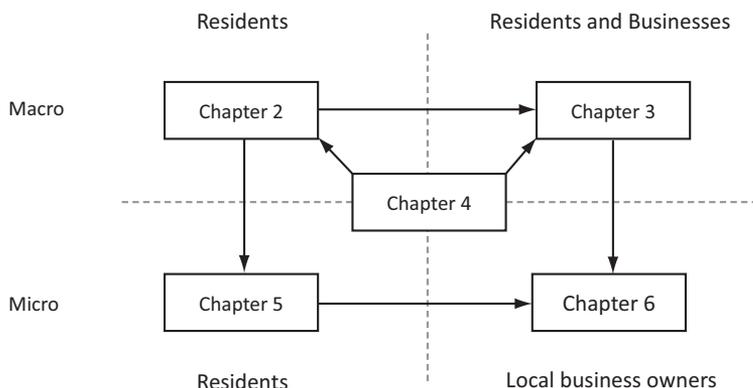


Figure 7.1 Structure of dissertation

Chapter 4 is a methodological chapter, which discusses more extensively the methods by which respondents’ opinions about the neighborhood can be aggregated to a neighborhood-level characteristic. Aggregating opinions of residents happens quite often in scientific research: social cohesion, for example, cannot be ‘counted’ (as, e.g., the number of police reports) or easily observed. Therefore, neighborhood residents are asked to give their opinion on the level of social cohesion, and these opinions are aggregated to one neighborhood-level score. The way in which these individual opinions are aggregated to the neighborhood level, and the consequences of the specific method of aggregation, is the subject of chapter 4.

Chapter 5 and chapter 6 aim to improve on social disorganization theory and routine activity theory by investigating the decision situations with which individual residents and local business owners are faced: are they willing to intervene on behalf of the public good, and to what extent is that willingness affected by their expectations about the actions by others? Chapter 5 is a continuation of the neighborhood-level investigations of chapter 2, whereas chapter 6 follows from both chapter 5 and chapter 3.

Chapter 7 concludes this dissertation by summarizing the findings of the previous chapters. In addition, several suggestions for further research are offered.

## 7.2 Summary of findings

Chapter 2 tests the central hypotheses of social disorganization theory (Shaw and McKay 1969) including its relatively recent extensions (Skogan 1990). The main argument of social disorganization theory is that neighborhoods with low socioeconomic status, high ethnic heterogeneity, and high population turnover lead to little social cohesion, mutual trust, and social control. These inhibit neighborhood residents to jointly reach common goals, such as combating social and physical

disorder. Skogan (1990) argues that in turn, disorder leads to population turnover, less social cohesion, and less social control, thus coming full circle. The empirical findings in chapter 2 suggest that neighborhoods have relatively stable levels of disorder over time; that high levels of disorder lead to population turnover at a later time point; and that high population turnover leads to a lower percentage of people taking action to improve the livability and safety of the neighborhood. Neighborhood disorder thus reinforces itself via a weakening of community processes of social control.

Neighborhoods are not only places where people live, but also places where people work and spend their leisure time. Chapter 3 also investigates the neighborhood level, but introduces the presence of businesses as a predictor of social and physical disorder. In addition, we discuss the potential effects of employees of such businesses. Routine activity theory argues that employees are 'place managers', people who exercise social control because they are responsible for a specific place (i.e., a business). Although businesses may attract potential offenders, to what extent is this offset by the presence of employees who might intervene in problematic situations? The empirical findings suggest that a higher number of businesses leads to more social and physical disorder, supporting the findings of previous scholars. More specific analyses reveal that medium-sized and large bars (in terms of number of employees), medium-sized and large fast-food establishments, and large supermarkets add to a neighborhood's social disorder. Large high schools and large supermarkets add to the neighborhood's physical disorder. Thus, the results suggest that the net effect of business presence and business size is to increase social and physical disorder rather than decrease it. In addition, we find support that the presence of some businesses is especially detrimental in already disadvantaged neighborhoods.

Chapter 4 serves as a methodological chapter and as a transition between the neighborhood-level studies (chapter 2 and chapter 3) and the individual-level studies (chapter 5 and chapter 6) in this dissertation. Chapter 2 and 3 use several variables which are constructed by aggregating the opinions of individual residents to one neighborhood-level 'score'. The empirical analyses in these chapters also revealed that the use of a relatively new and sophisticated method of aggregation (Raudenbush and Sampson 1999) did not lead to substantive differences in subsequent analyses. Chapter 4 therefore compares two methods of aggregating respondents' opinions in more detail. The 'traditional' method takes the mean of opinions about several indicators of disorder per respondent, and then takes the mean of all respondents within the same neighborhood. The more sophisticated 'ecometrics' method also takes the number of respondents per neighborhood into account, but also personal characteristics which may affect one's opinion of the neighborhood, thus leading to a more objective 'score'. We show that the more sophisticated 'ecometrics' method comes to somewhat different conclusions than the 'traditional' method with regard to which Amsterdam neighborhoods experience the most problems. Thus, there *are* differences between the two methods when a *ranking* of neighborhoods is made. A practical implication of this study is that, if grant money is distributed among a fixed number of neighborhoods and the neighborhoods are selected based on the 'traditional' method of aggregation, some neighborhoods

are left without support while such a subsidy is actually justified according to the 'econometrics' method.

Chapter 5 points out that social disorganization theory is a *neighborhood-level* theory, and that the theory is unclear about the individual-level mechanisms underlying its explanations. The aim of this study was to investigate one such individual-level mechanism, i.e., the relationship between an individual's expectation that others are willing to exercise social control and the individual's own willingness to exercise social control in disorderly neighborhood situations. We used an existing game-theoretical model of such 'volunteer' behavior to model the decision situations of individual residents. The empirical findings show that residents are more willing to intervene (i.e., take *any* kind of action to address the situation) in more serious problems, such as someone breaking into a car, than in less serious problems, such as loitering children. The most important predictor of an individual's willingness to intervene is his/her expectation about the behavior of others. If a resident expects that others will intervene, (s)he is also more willing to intervene. This result is intuitively plausible, but contrary to the prediction based on game theoretical modeling of this situation.

Chapter 6 compares residents to 'local' business owners, i.e., residents who make their home and have their own business in the same neighborhood, with regard to their behavior on behalf of the neighborhood. We point out that routine activity theory neglects the business owner, who can also be seen as 'place managers', people who exercise social control because they are responsible for a specific place (i.e., a business). Local business owners combine the role of 'guardian' (i.e., because they are neighborhood residents) and the role of 'place manager' (i.e., because they have a business in that same neighborhood). Congruent with the arguments in chapter 5, we hypothesize that local business owners are more willing to intervene in problematic situations, and are more likely to engage in neighborly activities than other residents. Our empirical results show that local business owners only differ from *unemployed* residents with regard to their willingness to intervene in *disorderly* situations. The findings suggest that this difference is explained because local business owners have higher expectations about the intervention by others (which affect their own behavior) and because local business owners have greater belief in their *own* capability to solve problematic situations.

In summary, the empirical chapters of this dissertation each provide part of the answer to the main research question. Social disorder and physical disorder in neighborhoods can be explained by action or inaction of a variety of actors, e.g., neighborhood residents, local business owners, visitors, and the police. Action and inaction refers to offending behavior, but also to actions of social control. On the neighborhood level, we can investigate the aggregate of (in)actions by these actors. In chapter 2 and chapter 3, we found, *in line with expectations*: (a) neighborhoods with the structural characteristics of lower socioeconomic status, higher population turnover, and higher ethnic heterogeneity experience more social and physical disorder; (b) the relationship between the structural characteristics and disorder can be explained in large part because these neighborhoods have less social cohesion and less social control; (c) neighborhoods with more business presence experience more disorder. The *unexpected findings* of chapter 2 and chapter 3 are:

(a) neighborhood disorder itself can be an indirect cause of more disorder by affecting population turnover, social cohesion, and social control, which in turn lead to more disorder; (b) neighborhoods with larger businesses also experience more disorder. In the aggregate, it seems that the actions of businesses and business employees do not offset the potential harmful behavior by the visitors the businesses attract. In chapter 5 and chapter 6, we focus on the informal (i.e., unorganized) actions of individual actors: residents and local business owners. *In line with our expectations*, we found that individual actors are more willing to take action to remedy more serious problems: the respondents indicate that they are more willing to do something if they see (e.g.) a burglary happening than if they see (e.g.) loitering youths. *In contrast to our expectations*, (a) individual actors are more willing to take action if they also expect others to do so; (b) and local business owners' willingness to act differs significantly only from unemployed residents. The next section discusses the unexpected findings more fully and offers suggestions for further research.

### 7.3 Suggestions for further research

#### 7.3.1 Businesses: meeting places of offenders, targets and controllers

Routine activity theory argues that deviant behavior occurs when potential offenders meet suitable targets in the absence of capable controllers (Cohen and Felson 1979). Theoretically, businesses can play several roles in this meeting function. First, businesses facilitate meeting of offenders, targets, or controllers by *attracting* people to the neighborhood. Some types of businesses may attract motivated offenders because of well-known criminal opportunities, whereas other businesses attract all kinds of people, but some of these people are potential offenders who notice criminal opportunities (Brantingham and Brantingham 1995). However, this does not necessarily mean that there is actually more social and physical disorder at or in the vicinity of these businesses. Businesses may also attract capable controllers, who have a deterrent effect or intervene when this is necessary. Second, and often overlooked, businesses also have an *active* function: business owners and employees can also act as potential offenders (e.g., by producing noise or litter) and act as capable controller.

Chapter 3 attempts to integrate these explanations and judge the effect of these processes, but the investigation remains implicit: only the *net effect* of business presence can be ascertained. Two businesses may lead to the same level of physical disorder (e.g., litter on the street), but with current data we are not able to exactly point out why this is the case. For example, one business may attract many potential offenders, but the employees also are very strict in maintaining order. The employees of another business may not be concerned with such issues at all, but because the business does not attract many potential offenders, the resulting level of disorder is similar. More generally, further research is needed to investigate how many people are attracted to which type of business and how many of these people are potential offenders, suitable targets, or capable controllers.

The argument can be extended further by focusing on the effects of business *diversity* and the *geographic distribution* on deviant behavior. Jacobs (1961) argued that diversity and geographic distribution of businesses is a good thing, because it stimulates ‘normal’ use of the neighborhood by attracting a continuous but manageable flux of people. However, empirical evidence for this argument is lacking. On the one hand, clustering of businesses by type and space (e.g., when many bars are located in a small area of town) leads to a concentration of people and arguably to an ‘unhealthy’ mix of offenders and targets. On the other hand, by having all of these people in a certain area, they may become more manageable than when all of these people are distributed across a large area (e.g., when government and local business owners work together).

### 7.3.2 Disentangling cause and effect

In chapter 2, we use a longitudinal neighborhood-level dataset to investigate social disorganization theory. When we estimate cross-sectional models using these data, we replicate the findings of previous studies: population turnover, socioeconomic status, and ethnic heterogeneity are related to social cohesion and feelings of responsibility, and these are related to disorder. However, when estimating longitudinal models, the results suggest that disorder is rather stable over time and reinforces itself by lowering feelings of responsibility and causing population turnover.

Because the earlier cross-sectional results mimicked those of previous studies, this suggests that our longitudinal findings are not due to the setting (i.e., one Dutch city), but rather due to more appropriately allowing for a temporal lag when estimating these causal relationships. Thus, these results show how important it is to disentangle cause and effect when trying to explain levels of social and physical disorder. In addition, this asks for a theoretical improvement regarding the proper time period in which the processes of social disorganization occur. Such theoretical improvements are necessary because they have implications for which data should ideally be gathered. Instead of ‘simply’ gathering longitudinal data, such data need to be collected at suitable intervals. Intervals that are too long will essentially reduce it to cross-sectional data, but intervals that are too short do not capture how the neighborhood changes in response to changes in social cohesion and social control.

In chapter 3, we use cross-sectional data, because there were no longitudinal neighborhood-level data available which capture the structural neighborhood characteristics, the presence of businesses and the amount of social and physical disorder. Consequently, we tried to be cautious in arguing on “cause” and “effect”. Ideally, future research will simultaneously investigate the causes and consequences of business presence and disorder. Merchants may hesitate to open a business in a neighborhood with high levels of crime, and therefore the presence of businesses in a neighborhood may be a result of low levels of social and physical disorder rather than a cause. In addition, small businesses may not ‘survive’ as easily as larger businesses in neighborhoods with a lot of social and physical disorder. Business livelihood depends on customer demand, and customers arguably prefer to visit businesses without litter, vandalism or panhandlers in the surrounding area: small businesses, which attract relatively few customers to begin with, may be more easily perturbed than large businesses.

### 7.3.3 Individual-level mechanisms

The ingredients of capable guardianship are relatively unknown. One ingredient is the willingness to take action on behalf of a public good, e.g., address a disorderly situation (see Reynald 2010). In chapter 2, we were able to disentangle such willingness (or, potential for social control, (measured as ‘feelings of responsibility for the livability and safety of the neighborhood) and actual social control behavior on the neighborhood level. Using longitudinal data, we do *not* find direct support for the hypothesis that high willingness to take action leads to less social and physical disorder. We suggested that actual behavior is necessary to reduce disorder.

In chapter 5 and chapter 6, we investigated individual-level willingness to take action. In chapter 5, we focused on the issue how a resident’s expectations that others intervene affects his or her own willingness to intervene. In chapter 6, we elaborated on the previous chapter by comparing residents to local business owners, residents who make their home and have their own business in the same neighborhood. Current theory is unclear about differences between these two groups: are ‘guardians’ (i.e., residents) more willing to take action on behalf of the public good than people who combine the role of ‘guardian’ (i.e., as a resident) and ‘place manager’ (i.e., as a business owner) in the same neighborhood? Because an individual-level theory of action with regard to guardianship and place management is largely lacking in the criminological literature, we used an existing game-theoretical model to derive hypotheses. Empirically, we do not find many differences between the two groups of actors.

The individual-level empirical studies in chapter 5 and chapter 6 are rather limited because we only compare local business owners to residents. Future research is needed to compare the willingness to intervene and actual intervention by residents and non-residents, residents who have their own business in another neighborhood, business employees who live in the same neighborhood or in other neighborhoods, and so on. In addition, the results of these studies need to be interpreted in combination with the time spent by each controller in a neighborhood (and during which time of the day they spend such time). In similar situations, residents may turn out to be most *willing* to exercise social control, but these residents may not be present during the day. Thus, they may not have the most *opportunity* to actually intervene. Such research may lead to theoretical improvements regarding the relative importance of each type of controller.

More generally, future research can improve on current theories by investigating the individually interdependent micro-explanations underpinning neighborhood outcomes. This calls for an *integration* of previous research on the selection of targets by offenders (e.g., Bernasco 2010), the suitability of targets, the willingness for action and realized actions by controllers (e.g., Reynald 2010), as well as the movement patterns of all three actors. Such an integration could be based on an interplay of analyses on existing large scale datasets (as used in this dissertation), experiments in realistic settings (e.g., Keizer, Lindenberg, and Steg 2008), and agent-based simulation methods which investigate macro-outcomes of individual-level assumptions (e.g., Bosse, Elffers, and Gerritsen 2010).



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# Samenvatting

## **Sociale en fysieke overlast: hoe gemeenschap, bedrijvigheid en ondernemers overlast in Nederlandse buurten beïnvloeden**

Sociale en fysieke overlast zijn gedragingen en omstandigheden die men als 'hinderlijk' beschouwt en als 'bedreigend' ervaart, zoals openbare ruzies en rommel op straat (Perkins en Taylor 1996; Taylor 1999). Overlast wordt als minder ernstig ervaren dan vele andere vormen van deviant gedrag, zoals gewapende overval en diefstal. Desalniettemin is overlast een belangrijk probleem voor de samenleving omdat het zo frequent voorkomt. Ook kan fysieke overlast over langere tijd worden waargenomen (bijvoorbeeld als een kapotgeslagen bushokje niet meteen wordt gerepareerd), terwijl vele ernstige delicten alleen kunnen worden waargenomen terwijl ze aan de gang zijn. Tot slot kan fysieke en sociale overlast ook leiden tot ernstiger vormen van criminaliteit (Wilson en Kelling 1982).

De Nederlandse overheid besteedt al geruime tijd aandacht aan overlast. Sinds 2000 wordt geprobeerd de 'leefbaarheid', waarvan overlast een belangrijk onderdeel is, te verbeteren. In 2003 kondigde minister Kamp (Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer) een programma aan om 56 wijken in de 30 grootste steden van Nederland te verbeteren (VROM 2003). In 2006 breidde minister Winsemius deze lijst uit tot 140 wijken, waarna minister Vogelaar (Wonen, Wijken en Integratie) deze weer terugbracht tot 40 wijken in 2007 (EZ 2008).

De combinatie van "wonen" en "werken" in deze aandachtswijken is een speerpunt van de verbeterplannen (VROM 2007). De aanwezigheid van bedrijven en lokaal ondernemerschap zou de wijk verbeteren: *"Ondernemerschap en bedrijvigheid dragen wezenlijk bij aan de kracht van een wijk. Het creëert nieuwe werkgelegenheid en economische groei. Het draagt bij aan onderlinge solidariteit tussen wijkbewoners en schept nieuwe perspectieven voor individuen. Ook is ondernemerschap goed voor de integratie en arbeidsparticipatie en daarmee de emancipatie van kwetsbare groepen. Verder dragen bedrijven bij aan de leefbaarheid van een wijk door te investeren in hun pand en bedrijfsomgeving (schoon, heel en veilig) en door het leveren van voorzieningen aan bewoners"* (EZ 2008).

Bewijs voor deze optimistische uitspraken ten aanzien van het effect van bedrijvigheid en ondernemerschap is echter moeilijk te vinden. Jacobs (1961) was een groot voorstander van het samenbrengen van bedrijven en woonhuizen; dit zou leiden tot een gelijkmatige doorstroom van mensen in de straat, waardoor 'normaal' gebruik van de publieke ruimte en 'ogen op straat' wordt gestimuleerd. Daarentegen blijkt uit recente empirische studies (bijv., McCord, Ratcliffe, Garcia, en Taylor 2007; Wilcox, Quisenberry, Cabrera, en Jones 2004) vaak dat bedrijfsaanwezigheid samenhangt met meer fysieke overlast (bijv. vuilnis) en sociale overlast (bijv. bedelen). Daarnaast is er nauwelijks onderzoek gedaan naar de acties van

lokale ondernemers ten behoeve van de buurt: het is onbekend in welke mate zij daadwerkelijk investeren in de bedrijfsomgeving.

Dit proefschrift is een collectie van empirische artikelen waarin sociale en fysieke overlast centraal staat. Er wordt empirisch onderzocht wat de relatie is tussen de gemeenschapsgevoelens in een buurt, de aanwezigheid van bedrijven in die buurt, en de sociale en fysieke overlast. Uit de sociale desorganisatietheorie en de routine activiteiten theorie worden argumenten gecombineerd om tot toetsbare hypothesen over deze relaties. In dit proefschrift wordt (a) de huidige theorie op het niveau van de buurt *getoetst* met longitudinale data; (b) de huidige theorie *uitgebreid* met bedrijfsaanwezigheid en bedrijfs grootte als voorspellers van sociale en fysieke overlast; (c) huidige theorie *verbeterd* door de mechanismen van sociale controle op individueel niveau te onderzoeken. Hieronder volgt een samenvatting van de vijf empirische hoofdstukken.

Hoofdstuk 2 richt zich op de ‘traditionele’ verklaringen van sociale en fysieke overlast: de gedeelde gevoelens van gemeenschap door buurtbewoners. De *sociale desorganisatietheorie* is één van de meest prominente theorieën met betrekking tot buurtverschillen in criminaliteit en overlast. De theorie stelt dat vooral buurten met een groot aantal verhuizingen, lage sociaaleconomische status en grotere etnische heterogeniteit kampen met problemen zoals overlast (Bursik en Grasmick 1993; Shaw en McKay 1969). In dergelijke buurten missen de bewoners namelijk een ‘collectieve zelfredzaamheid’: zij kunnen zich moeilijk organiseren om gezamenlijke doelen te bereiken (Sampson, Raudenbush, en Earls 1997). Als buurtbewoners dit wel doen en een gemeenschap vormen, leidt dit tot informele sociale controle waardoor mogelijke ordeverstoorers zich zullen inhouden of direct worden aangepakt. Wilson en Kelling (1982) betogen in hun ‘theorie van de gebroken ramen’, net als Skogan (1990) in zijn ‘overlast en verval’ model, dat overlast niet alleen een gevolg, maar ook een oorzaak is van verhuizingen en geringe buurtgemeenschap. Na verloop van tijd kan overlast de cohesie aantasten en de sociale controle doen afnemen (bijv., Robinson, Lawton, Taylor, en Perkins 2003) en leiden tot verhuizingen naar betere buurten (Liska en Bellair 1995). Die verhuizingen, geringe sociale cohesie en sociale controle leiden op hun beurt weer tot meer overlast. Dit uitgebreide model van de sociale desorganisatie theorie (waarin overlast zowel een gevolg is als een oorzaak), is vanwege het ontbreken van longitudinale data slechts sporadisch empirisch getoetst. Betrouwbare informatie over de sociale cohesie, sociale controle, en overlast in buurten over langere tijd is schaars. In hoofdstuk 2 zijn wij er in geslaagd dergelijke data te creëren door individuele bewonersenquêtees te aggregeren naar het niveau van de buurt. Met deze longitudinale dataset op buurtniveau van de stad Utrecht (74 buurten over een periode van 10 jaar), is het uitgebreide model van sociale desorganisatietheorie getoetst. De aanwezigheid van overlast blijkt relatief stabiel te zijn door de tijd heen. Een hoge mate van overlast leidt tot meer verhuizingen op een later moment, en meer verhuizingen leidt tot een lager percentage mensen dat zich inzet voor de veiligheid en leefbaarheid van de buurt. Omdat het de gemeenschap verzwakt, versterkt overlast zichzelf.

Buurten zijn niet alleen plekken waar mensen wonen, maar ook plekken waar mensen werken en hun vrije tijd besteden. Hoofdstuk 3 richt zich net als hoofdstuk 2 op het niveau van de buurt en ‘controleert’ voor de verklaringen van sociale des-

organisatie theorie. Daarnaast introduceert dit hoofdstuk de aanwezigheid van bedrijven als een voorspeller van sociale en fysieke overlast. Ook wordt gekeken naar de mogelijke effecten van het aantal werknemers van deze bedrijven op overlast. De routine activiteiten theorie stelt dat werknemers ‘plaatsmanagers’ zijn, mensen die sociale controle uitoefenen omdat zij verantwoordelijk zijn voor een specifieke plaats (in dit geval een bedrijf). Bedrijven trekken mogelijke overtreders aan, maar in hoeverre wordt dit gecompenseerd door de aanwezigheid van werknemers die mogelijk ingrijpen in problematische situaties? De empirische bevindingen suggereren dat de aanwezigheid van bedrijven leidt tot meer sociale en fysieke overlast. Specifieke analyses geven aan dat middelgrote en grote bars (in termen van het aantal werknemers), middelgrote en grote fastfood-gelegenheden en grote supermarkten bijdragen aan de sociale overlast van een buurt. Grote middelbare scholen en grote supermarkten dragen bij aan de fysieke overlast. De resultaten laten hiermee zien wat het netto-effect is van bedrijfsaanwezigheid en bedrijfsgrootte: sociale en fysieke overlast blijft gelijk of neemt zelfs toe door bedrijvigheid. Daarnaast blijkt de aanwezigheid van sommige bedrijven vooral in achterstandswijken te leiden tot overlast.

Hoofdstuk 4 is een methodologisch hoofdstuk dat fungeert als een overgang tussen de studies op buurtniveau (hoofdstuk 2 en hoofdstuk 3) en de studies op het individuele niveau (hoofdstuk 5 en hoofdstuk 6) in dit proefschrift. Hoofdstuk 2 en 3 maken gebruik van verschillende variabelen die zijn geconstrueerd door de meningen van individuele bewoners over hun buurt samen te nemen tot een ‘buurtscore’. Zo zijn bijvoorbeeld de meningen van de bewoners over de buurtcohesie geaggregeerd tot één score voor ‘cohesie’ per buurt. Uit de empirische analyses in deze hoofdstukken is gebleken dat het gebruik van een relatief nieuwe en geavanceerde methode van aggregatie (Raudenbush en Sampson 1999) geen substantiële gevolgen had voor de latere analyses. Hoofdstuk 4 vergelijkt twee methoden van aggregatie van de meningen van respondenten in meer detail. De ‘traditionele’ methode neemt het gemiddelde van de meningen over verschillende indicatoren van overlast per respondent, en neemt dan het gemiddelde van alle respondenten binnen dezelfde buurt. De meer geavanceerde ‘ecometrische’ methode houdt rekening met het aantal respondenten per buurt (meer respondenten leidt tot een meer betrouwbaar oordeel van de mate van overlast) en met de persoonlijke kenmerken van respondenten die hun mening over de buurt zouden kunnen beïnvloeden. De ecometrische methode zou derhalve tot een objectievere ‘score’ moeten leiden. Uit hoofdstuk 4 blijkt dat, wanneer een rangorde wordt gemaakt van de buurt met de minste overlast tot en met de buurt met de meeste overlast, de ecometrische methode tot enigszins verschillende conclusies komt dan de traditionele methode. Een praktische implicatie van deze studie is dat, als subsidiegeld wordt verdeeld over een vast aantal buurten en deze buurten bovendien geselecteerd zijn op basis van de ‘traditionele’ methode van aggregatie, sommige wijken geen subsidie krijgen terwijl de subsidie wel gerechtvaardigd is (op basis van de ecometrische methode).

Hoofdstuk 5 benadrukt dat de sociale desorganisatie theorie een theorie is op *buurtniveau*, en dat de theorie onduidelijk is over haar mechanismen op individueel niveau. Het doel van dit hoofdstuk is om een dergelijk mechanisme op individueel niveau te onderzoeken, namelijk de relatie tussen de verwachting van een individu

dat anderen bereid zijn om sociale controle uit te oefenen bij problematische situaties in de buurt en de eigen bereidheid van dit individu om sociale controle uit te oefenen. Wij maakten gebruik van een bestaand speltheoretisch model om dergelijk “vrijwilligersgedrag” van individuele buurtbewoners te onderzoeken. De empirische resultaten laten zien dat bewoners meer bereid zijn om in te grijpen (dat wil zeggen: één of andere vorm van actie om de problematische situatie op te lossen) in ernstiger problemen. Bewoners zeggen bijvoorbeeld eerder in te grijpen als iemand zich verdacht bij een auto gedraagt, dan wanneer kinderen rondhangen in de buurt. De verwachting die een individuele bewoner heeft over het gedrag van andere buurtbewoners, blijkt de belangrijkste voorspeller te zijn van de eigen bereidheid om in te grijpen. Als een bewoner verwacht dat anderen actie zullen ondernemen, is de bewoner ook meer bereid om in te grijpen.

Hoofdstuk 6 vergelijkt bewoners en ‘lokale’ ondernemers (bewoners die een eigen bedrijf hebben in hun woonbuurt), met betrekking tot hun gedrag ten behoeve van de buurt. De routine activiteiten theorie onderkent dat werknemers een belangrijke rol kunnen spelen bij de preventie van criminaliteit. Deze ‘plaatsmanagers’ zijn meer dan andere mensen geneigd om sociale controle uit te oefenen, omdat zij verantwoordelijk zijn voor een specifieke plaats (bijvoorbeeld een bedrijf). De theorie heeft echter de *bedrijfseigenaar* over het hoofd gezien. Lokale ondernemers zijn zowel ‘bewoner’ als ‘plaatsmanager’. In overeenstemming met de argumenten uit hoofdstuk 5 veronderstellen we dat de lokale ondernemers meer bereid zijn om in te grijpen in problematische situaties, en dat de ondernemers vermoedelijk vaker deelnemen aan buurtactiviteiten dan andere bewoners. De empirische resultaten laten zien dat lokale ondernemers alleen verschillen van de *niet werkzame* bewoners met betrekking tot hun *bereidheid* om in te grijpen in *overlastsituaties*. Lokale ondernemers hebben hogere verwachtingen over het ingrijpen van anderen (wat hun eigen bereidheid tot ingrijpen beïnvloedt) en hebben meer vertrouwen in hun eigen vermogen om problematische situaties op te lossen.

Samengevat geven de empirische hoofdstukken van dit proefschrift ieder een deel van het antwoord op de centrale onderzoeksvraag. Sociale en fysieke overlast in buurten kan worden verklaard door het doelgerichte gedrag van verschillende actoren, zoals buurtbewoners, lokale ondernemers, bezoekers en de politie. Doelgericht gedrag verwijst niet alleen naar het overtreden van de bestaande normen, maar verwijst ook naar het uitoefenen van sociale controle. Op het buurtniveau kan het netto-effect van het gedrag van de actoren worden vastgesteld. De empirische resultaten uit hoofdstuk 2 en hoofdstuk 3 zijn als volgt: (a) buurten met bepaalde structurele kenmerken (lage sociaaleconomische status, veel verhuizingen en hoge etnische heterogeniteit) ervaren meer sociale en fysieke overlast; (b) de relatie tussen de structurele kenmerken en overlast wordt voor een groot deel verklaard door de beperkte sociale samenhang en sociale controle in deze buurten; (c) buurten waar meer bedrijven aanwezig zijn, kampen met meer overlast. Daarnaast kunnen op basis van de empirische resultaten ook minder voor de hand liggende conclusies getrokken worden: (a) overlast in de buurt kan zelf een indirecte oorzaak van meer overlast zijn door het stimuleren van verhuizingen en het aantasten van de sociale cohesie en sociale controle; (b) in buurten met grotere bedrijven komt vaker overlast voor. Het lijkt erop dat de acties van bedrijven en werknemers ten

behoefte van de buurt niet opwegen tegen de overlast die ontstaat door de bezoekers die deze bedrijven aantrekken. In hoofdstuk 5 en hoofdstuk 6 richtten we ons op de informele (ongeorganiseerde) acties van individuele actoren, namelijk door bewoners en lokale ondernemers. In overeenstemming met de verwachtingen, blijken individuele actoren meer bereid te zijn om actie te ondernemen om ernstige problemen te verhelpen. In tegenstelling tot de verwachtingen, (a) zijn individuele actoren meer geneigd om actie te ondernemen als zij ook verwachten dat anderen dat doen; (b) verschillen lokale ondernemers alleen van niet-werkzame bewoners met betrekking tot hun actiebereidheid.



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## About the author

Wouter Steenbeek (1982) studied information science at Utrecht University and received his Master of Science degree in 2004 (Business Informatics, cum laude). Later, he developed an interest in sociology, particularly in topics pertaining to social cohesion and social order, and followed courses in sociology in the academic year 2005-2006. From September 2006 to October 2010, he conducted his PhD research at the Interuniversity Center for Social Science Theory and Methodology (ICS) at Utrecht University. In April and May of 2009 he was a visiting scholar at the University of California, Irvine. In his PhD thesis, he used Dutch data to test (an extended version of) social disorganization theory, and investigated the effect of business presence on the social and physical disorder in the neighborhood. Next, he focused on individual actors, investigating 'guardianship' and 'place management' by residents and local entrepreneurs in 161 Dutch neighborhoods. During his doctoral studies, Wouter taught classes of "Introduction to Sociology" ("Problemen en Theorieën van de Sociologie") and supervised students with their bachelor and master thesis. He is currently a postdoctoral research fellow at the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR). There he expands on his PhD research by focusing on longitudinal modeling of the reciprocal relationship between business presence and crime.



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